

SCALING READINESS REPORT AND SCALING PLAN

for training and certification approach for
small scale pig feed producers in Uganda



RESEARCH
PROGRAM ON
Livestock



UGANDA



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**BETTER LIVES
THROUGH
LIVESTOCK**



Executive summary

This report assesses the scaling readiness of a component of the CGIAR Research Program on Livestock (Livestock CRP), "Improving pig productivity and incomes through an environmentally sustainable and gender-inclusive integrated intervention package in Uganda" under the name of "Piloting and evaluating a training and certification business model to improve feed quality from small scale commercial feed producers in Uganda," hereafter "the component".

Information presented in the report is synthesized from i) Livestock CRP Priority Country Project Uganda Plan and ii) an assessment conducted by the Impact at Scale (I@S) team of the International Livestock Research Institute (ILRI), consisting of interviews with key providers of the component and a desktop review of the evidence sources collected within the duration by the I@S team. The report's content should be considered flexible and will be updated based on the provision of further evidence.

The report consists of four sections. The first section, intervention profile, describes and assesses the characteristics of the component. The second section, innovation profile, explains the critical innovation the component aims to develop, the training and certification program, hereafter the program, in detail and assesses its characteristics in terms of its potential to achieve use at scale. The third section, the innovation package profile, highlights all the other innovations necessary to use the program at scale in Uganda context. It also provides an assessment of these other innovations. The final section, the scaling strategy, brings each of the three sections together and provides recommendations for improving the use of the training and certification program at scale in Uganda. Each section starts with a rationale, continues with a snapshot of the facts related to the section focus, and concludes with a diagnosis. In second and third sections a scaling readiness assessment is provided.

The report concludes that improving the content of the training and certification program will not be sufficient to increase the use of the program at scale. Although there are merits in improving the design of the program by capitalizing pictorial based blended learning approach, differentiating training options based on roles, scheduling the training in a flexible manner and creating an input-output mindset among the participants, the assessment shows that organizational innovations are critical for the success of the component. Specifically, we recommend that the component invests in:



Studying the experience of feed certification implementation groups in similar contexts to Uganda and prepare a plan for establishing a group/supporting an existing group with a similar mandate



Sharing the plan of the implementation group with the partners of the component and other organizations working in the feed sector



Studying the experience of feed standards associations in a similar context (such as dairy association in Uganda) and prepare an organizational establishment statement as well as a business plan for a new association/ updating organizational structure and business plans of existing suitable associations that can fulfill tasks required for feed standards monitoring and enforcement



Sharing the establishment and business plans with the partners of the component and other organizations working in the feed sector



Supporting testing of PigSmart digital extension platform and its dissemination to stakeholders working on extension in the pig sector

Acknowledgements

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We would like to thank Marc Schut and the scaling readiness team for valuable discussions and contributions to the study approach and ongoing collaborations around scaling readiness.

The study team would like to recognize and thank the Livestock CRP for funding this study through its Uganda priority country and the LLAFS flagship.

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Glossary

THE PROJECT

The project is part of the Livestock CRP under the name “Improving pig productivity and incomes through an environmentally sustainable and gender-inclusive integrated intervention package in Uganda.” It aims to improve pig value chains with a comprehensive approach. It is operationalized based on the [Livestock CRP Priority Country Project Plan](#) covering the period 2019–2021.

THE COMPONENT

The component is part of the project under the name “Piloting and evaluating a training and certification business model to improve feed quality from small scale commercial feed producers”. It is mapped to the feed and forages flagship of the project.

THE PROGRAM

The Program is the training and certification program, which is the focus innovation of the component. It is the innovation that the component invests in most of its resources.

THE FRAMEWORK

[The framework](#) synthesizes different tools and practices aiming to support ILRI scaling activities. It starts with preliminary data collection and leads to a scaling plan. It is designed by the ILRI I@S program. This report is a part of the workflow included in the framework.

THE INTEGRATED INTERVENTION PACKAGE

It is another expression that is used to refer to the project. It emphasizes the integration of different parts of the program.

CHARACTERIZATION

Characterization is the first step of the scaling readiness cycle. It includes the activities aiming to document and classify three critical units, i.e. interventions, innovations and stakeholders. Two of these three critical units, intervention or the component and innovation, the program, are characterized in this report by using a customized version of scaling readiness step 1.

DIAGNOSIS

Diagnosis is the second step of the scaling readiness cycle. It includes assessments of the characteristics of the interventions, innovations and stakeholders in the first step, the implications of these characteristics in achieving impact at scale and readiness and use assessments of innovations/innovation components. Diagnoses of the intervention and innovation are made in this report using a customized version of scaling readiness step 2.

STRATEGIZING

Strategizing is the third step of the scaling readiness cycle. It includes strategies for addressing the issues identified in the diagnosis step and improving the impact performance. Strategizing is done [partially](#) in this report by using a customized version of scaling readiness step 3.

Scaling readiness lexicon

EVIDENCE BASED MEASUREMENT



The measures of scaling readiness are calculated using evidence. Specific claims of readiness and use are assessed by means of a hierarchy of sources of verification. High quality science articles and other peer reviewed documents are the first sources. In their absence, technical reports or other publicly scrutinized documents are used to back up specific evidence claims. In the absence of any documents, different opinions of experts who are proven to have sufficient competences are triangulated to identify the measures.

INNOVATION



A novel product, service, approach, organizational and institutional arrangement that has an economic, environmental, health, industrial etc. use in the society. Innovations can be technical or social. They can be tangible and intangible.

INNOVATION PACKAGE



The combinations of the innovations a project aims to scale and other innovations necessary to scale them. Innovation packages usually consist of technologies and other products, services, approaches, organizational and institutional arrangements necessary to improve awareness of, accessibility, affordability and usability of the technologies at scale.

INNOVATION READINESS LEVEL



It is a number indicating how mature or effective an innovation is to achieve its use objectives. It can be considered as a systematic answer to the question “how good an innovation works at scale”. It can be between 0, which indicates that the innovation is just an idea in the mind of its potential developers, and 9, which indicates that the innovation has been proven to achieve its use objectives in uncontrolled conditions similar to the context the innovation is used without a research and development project support. Research and development projects increase existing innovation readiness levels by improving the design of the innovations, developing and validating the improved designs in controlled and uncontrolled conditions.

INNOVATION USE LEVEL



It is a number indicating the level of the use of innovations at scale. It can be considered as systematic answers to the combined questions of “who uses an innovation and in which order of magnitude”. It can be between 0, which indicates that the innovation is not being used in the context a project aims to increase to use of the innovation, and 9, which indicates that the innovation is being commonly used among the users who are not involved in any innovation design, development or dissemination processes. Research and development projects increase existing innovation use levels by disseminating the innovations and increasing the use of innovations by other innovation professionals who are not involved in the same projects as well as users who are not involved in any innovation processes.

SCALING READINESS LEVEL



It is a single number combining the readiness and use level of all the innovations in the innovation package. It can be considered as a single answer to the question of “what is the likelihood that an innovation package will achieve impact at scale”. There are different ways of calculating scaling readiness Levels based on the preferences of the management system it is used. It can be an average level, a minimal level or a weighted average level. In this report, “averaging” approach is used to calculate scaling readiness.

Background

The CGIAR Research Program on Livestock (Livestock CRP) has been working to improve the pig value chain in Uganda since 2012. Currently, the Livestock CRP is looking to test 'integrated intervention packages' in four priority countries, with the pig value chain in Uganda being one of those. It intends to invest in a coordinated effort that is meant to lay the groundwork for successful interventions that can lead to positive results for pig value chain actors, and which can later be scaled up sustainably to reach large numbers of beneficiaries on an ongoing basis, contributing to positive economic, nutritional, health and environmental outcomes.

The Impact at Scale program (I@S) is responsible for spearheading the scaling-up of innovations of International Livestock Research Institute (ILRI) programs for a sustainable future. This involves, among other objectives, providing appropriate management support, frameworks and tools for staff undertaking scaling-up activities. To provide effective support to ILRI work, I@S has designed a [scaling framework](#), hereafter "the framework". Since late 2019, I@S has been testing and validating the framework together with the Livestock CRP Uganda priority country team by incorporating state of the art approaches and tools developed within and outside the CGIAR such as Scaling Scan, ASAT and Scaling Readiness.

I@S has started to use the Framework on the Livestock CRP by initial data collection in October 2019. The data collection was followed by two scaling scan workshops with the participation of 40–50 stakeholders from pig value chain in Uganda. In the first workshop, the overall scaling ambitions of the Livestock CRP has been articulated. In the second workshop, the ambitions are validated by the stakeholders and the cases in which a deep analysis will be conducted using scaling readiness have been selected (Dror and Wu 2019). This report follows the earlier work and complements it with providing a detailed analysis and specific recommendations for the component.



**THE IMPACT AT SCALE PROGRAM (I@S)
IS RESPONSIBLE FOR SPEARHEADING
THE SCALING-UP OF INNOVATIONS OF
INTERNATIONAL LIVESTOCK RESEARCH
INSTITUTE (ILRI) PROGRAMS FOR A
SUSTAINABLE FUTURE.**

This report has been prepared using scaling readiness, a decision support system designed to support CGIAR projects and programs in designing, developing, disseminating and improving the use of innovations at scale. Scaling readiness concepts and indicators used in this report are explained in the scaling readiness lexicon in the beginning of the report. More general information about scaling readiness can be accessed via scalingreadiness.org. For the science dimensions of scaling readiness, a recent research [paper](#) (Sartas et al. 2020) and implementation dimension of the [Scaling Readiness Guide](#) (Sartas et al. 2020) can be useful.

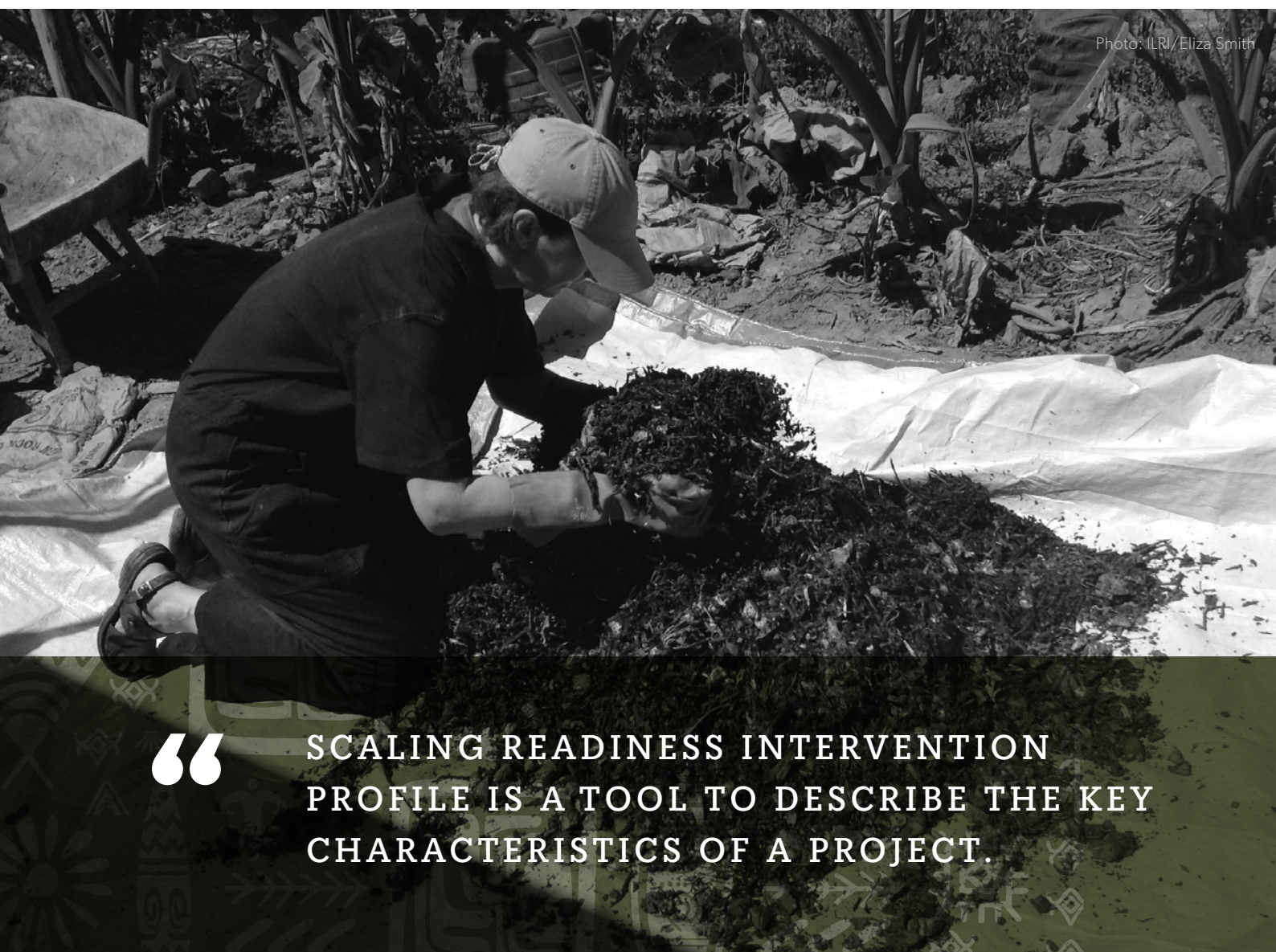
Intervention profile

Scaling readiness intervention profile is a tool to describe the key characteristics of a project, program and other initiatives. It aims to improve the performance of an intervention through:

- 1 Presenting management gaps in the design
- 2 Developing a shared understanding between the project managers, implementation team and partners that will deliver outputs
- 3 Creating a brief communication product for presenting the intervention to various stakeholders

In this report, a customized version of the scaling readiness intervention profile is used to characterize the component. In this section, the intervention profile sheet and its diagnosis are provided below.

Photo: ILRI/Eliza Smith



SCALING READINESS INTERVENTION
PROFILE IS A TOOL TO DESCRIBE THE KEY
CHARACTERISTICS OF A PROJECT.

Intervention profile sheet

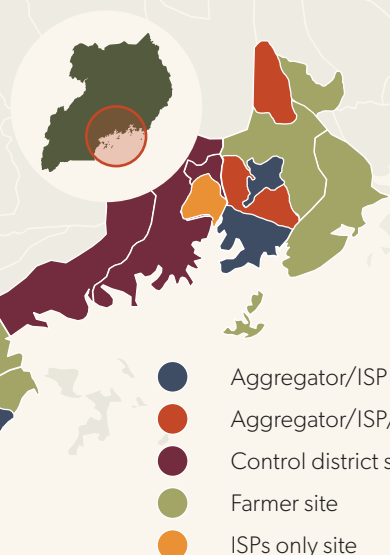
Piloting and evaluating a training and certification program to improve feed quality from small scale commercial feed producers.



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Places

Ugandan livestock consumption and production hotspots in Kampala, Masaka, Mukono and Wakiso



Investment (USD)



Key activities



Identify a private sector service provider for building capacity of feed compounders



Link compounders to pig producers



Use a mobile and a web app for feed processors to formulate high quality feed



Develop and validate training protocols



Support Ugandan government units to certify small scale feed producers



Test the application of mobile NIRS



Help setting up a self-regulatory mechanism to monitor the quality of the feed produced by trained compounders



Develop and disseminate messages aimed at improving proper concentrate supplementation



Monitor changes in knowledge attitudes and practices (KAP) of small-scale feed producers

Key partners



MAAIF
Ministry of Agriculture
Animal Industry and Fisheries



Timeline

Genesis

First idea for small scale pig feed producer registration via certification was adopted from Kenya

Livestock CRP support

CGIAR Livestock Research Program funded Small Scale Pig Feed Producers Project

Large scale use

Small scale pig feed production is done at large scale in Uganda



Proposal

A proposal for small scale pig feed production project was formulated

Successful enterprises

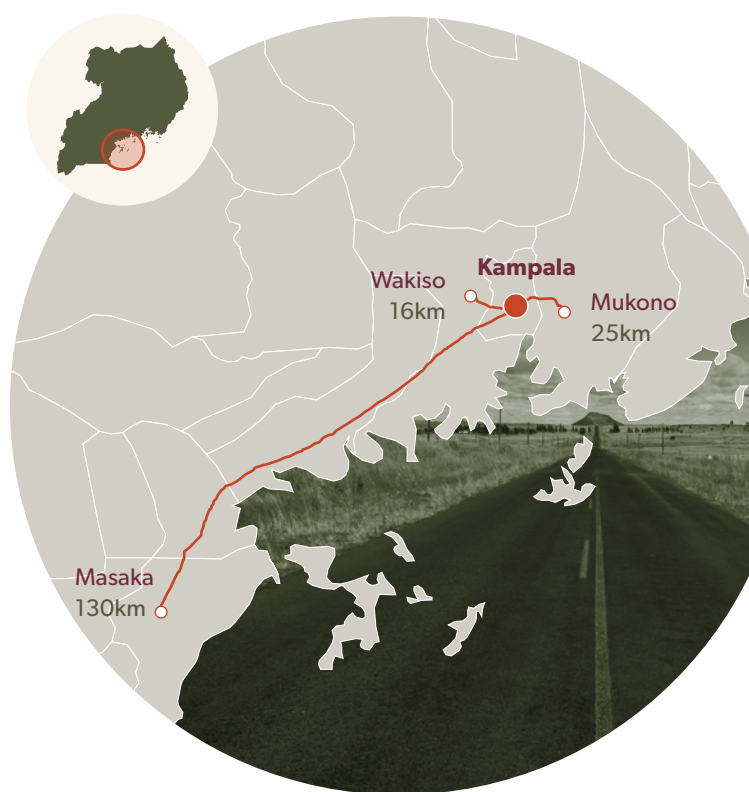
Successful scale pig feed enterprises have sufficient and certified capacity

Intervention profile diagnosis



PLACES THE COMPONENT WORKS

The geographical area targeted by the component (see [intervention profile sheet - the map](#)) is relatively concentrated and focused on some of the consumption and pig production hotspots in Uganda. It includes the largest pig demand center, Kampala and key supply areas Mukono, Wakiso and Masaka. Considering the fact that the component focuses on commercial production, the commercial viability of the supply from production areas to Kampala needs to be contemplated. Kampala is close to Mukono (25 km) and Wakiso (16 km) and the transportation costs can be within the limits of pig sale price. However, Masaka is relatively distant (up to 130 km). Considering the disruptions due the Covid-19 pandemic, the transportation cost of pig to Kampala can be prohibitive. We suggest recalculating the profit ratios of pig sales taking into account the Covid-19 conditions and cross check the commercial viability of pig sales in Masaka. In this initial phase of the project, [focusing the resources of the component in Mukono and Wakiso](#) might achieve a larger impact than distributing the resources in all three districts.



INVESTMENT LEVEL

The component has a relatively small budget of its own (under USD50,000), but will be co-financed by other components of the project. When the activities listed in the intervention profile sheet are cross checked with the focus activities of the other components, it is found that some of the component's activities can be linked to the other components directly, e.g. testing and using mobile and web app, monitoring the feed quality. However, how the remaining activities in the intervention profile sheet will be linked to other components of the project is not articulated. Considering the scope of these remaining activities, the budget of the component alone is hardly sufficient. If not already done in another document it might be useful to [co-plan and clarify co-allocations of the project resources on delivering the remaining activities to reduce the risk of delivery.](#)



TIMELINE

The concept of the component was based on a previous successful dairy sector [experience in Kenya](#) (Blackmore et al. 2020). It was first considered to be implemented in Uganda pig sector in 2016 and it became a part of the Livestock CRP plan in 2019. With the help of the other components of the project, the timeline for delivery of the component is realistic.

Profile of training and certification program

Scaling readiness innovation profile is a tool to describe the characteristics of an innovation aimed to be designed, developed, disseminated or to be used at scale. It aims to improve the performance of an intervention through i) presenting design gaps in the design of the innovation; ii) developing a shared understanding between the project managers, designer, developer and disseminators of the innovation; and iii) creating a brief communication product for presenting the innovation to various stakeholders. In this report, a customized version of the innovation profile is used to characterize the focus innovation of the component, “Training and certification program”. In this section, the innovation profile sheet, an overall diagnosis of the results in the innovation profile sheet, as well as innovation readiness and use assessments of the program are provided.

“

SCALING READINESS
INNOVATION
PROFILE IS A TOOL
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OR TO BE USED AT
SCALE.

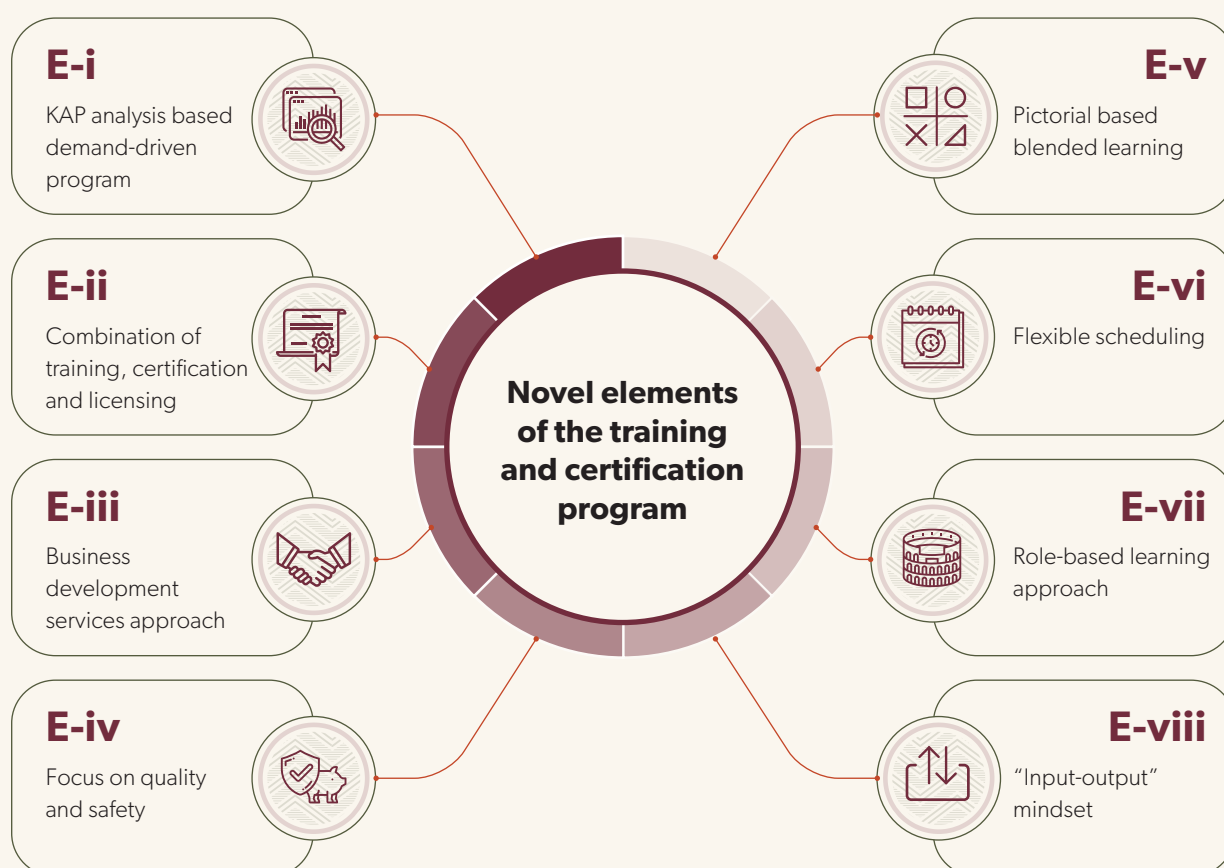
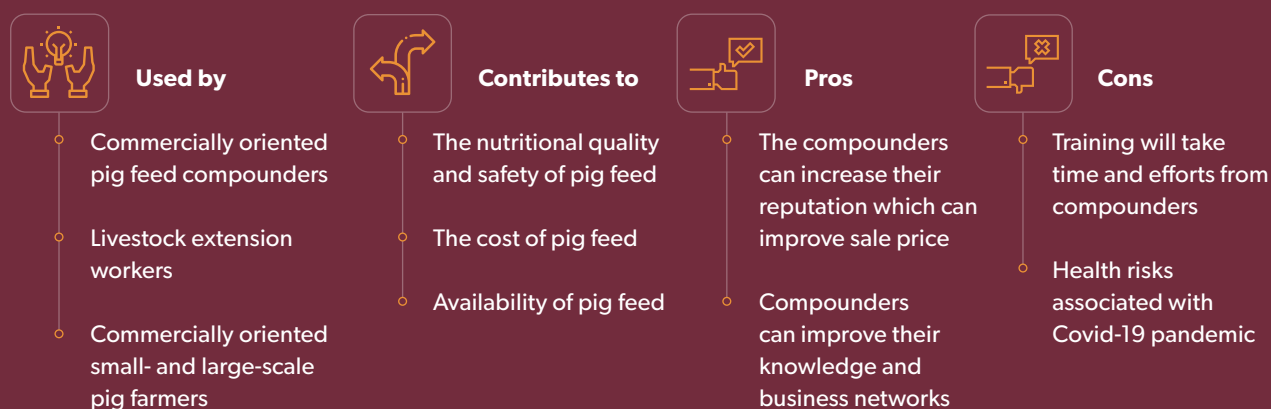


Photo: ILRI/Apollo Habtamu

Innovation profile sheet

The training and certification program

The program addresses the knowledge gap in producing high-quality pig feed in Kampala, Masala, Mukono in Uganda. By adopting similar programs developed and successfully implemented in East Africa for pig production and the dairy sector in Uganda to the Ugandan pig production sector. The program will improve pig productivity, increase the incomes of small scale pig producers and improve the food safety of pig based food.



Innovation profile diagnosis

This part provides information about the diagnosis of the I@S team on the items presented in the innovation profile sheet.

USERS



The training and certification program targets a variety of users who are key in the production of high quality pig feed production in Uganda, i.e. commercially oriented pig feed compounders, livestock extension workers and selected lead farmers. Compounders are the direct users of the knowledge generated in the program, extensionist are providers of the knowledge to producers or trainers of the compounders in many rural locations in Uganda and selected lead farmers, who mix feed themselves for pig production.¹ The specific people among the users who will participate are identified based on a preliminary assessment of the value chain (Baltenweck et al. 2019; Ouma et al. 2015). These indicate that **user identification of the training and certification program is robust.**

MAJOR CONTRIBUTION OF THE TRAINING AND CERTIFICATION PROGRAM IN UGANDA



I@S team has found that the targeted contributions of the program provided in the innovation profile sheet are well recognized among the Ugandan pig value chain actors and experts working in the business support services. Especially, increasing the quality of the compounded feed at a fair cost raised interest. **These demand-driven objectives increase the likelihood of increasing the use of the program at scale.**

ADVANTAGES (PROS) OF THE TRAINING AND CERTIFICATION PROGRAM IN UGANDA



In comparison to its alternatives available in Uganda, the program has a higher chance to improve the reputation of its participants among other compounders, extensionist and pig producing farmers. It will also help them to improve their knowledge and business networks. **Increased reputation, better knowledge and commercial networks are good incentives for users that leads to an increase in the impact of the program at scale in Uganda unless the cost of participation paid by the users is prohibitive.**

DISADVANTAGES (CONS) OF THE TRAINING AND CERTIFICATION PROGRAM IN UGANDA



Two major disadvantages of the training and certification program in relation to its alternatives in Uganda are the extra time and efforts necessary to participate in an event physically and health risks associated with physical participation due to the Covid-19 pandemic. **In the design of the program, strategies such as low class sizes, decentralized training events or partial digitalization can alleviate these disadvantages.**

¹. In the remaining part of the report "Users" will refer to compounders, extensionists and lead farmers.

NOVEL ELEMENTS OF THE TRAINING AND CERTIFICATION PROGRAM IN UGANDA



To achieve positive impact at scale new interventions need to do business differently and introduce novel elements. Therefore, it is important to identify the novel elements of an innovation to assess its potential impact at scale. In other words, the impact potential of the training and certification program depends on its novel elements.

l@s has identified eight novel elements of the training and certification program within the Ugandan context. Four of them are included in the current version of the component plan. Designing the program based on knowledge, attitude and practice assessment (E-i) preceding the implementation of the program will make the program more demand driven. Combining training with certification and licensing (E-ii) will increase the value added of participation in the program. Using a business development services approach (E-iii) will increase the user base of the program. Focus on quality and safety (E-iv) will reduce the risk of negative externalities associated with the program. *These four novel components are significant for the performance of the program in achieving impact at scale.*

Other four novel elements could not be identified in the current plan of the component clearly. These four elements, i.e. pictorial based blended learning (E-v), flexible scheduling (E-vi), role-based learning approach (E-vii) and “input - output mindset” (E-viii) have also a big potential to contribute to the performance of the training and certification program. l@s study on the profiles of the users of the program indicated that most of them are more responsive to pictorial based training materials and practical applications than text materials and theoretical training. If not already done, preparation or compilation of the pictorial materials and designing a curriculum prioritizing practical applications can be beneficial for increasing the impact of the program at scale. l@s study also indicated that most of the users of the program have limited time for attending a few days long course during the weekdays. Availability of the users might also vary based on their roles in feed and pig production. The program needs to have a flexible scheduling approach to increase its use at scale. A third finding of the l@s study was that among a pig producer units there are different roles and responsibilities. The owners of a significant portion of the small scale farms or enterprises, are different from the farm managers or husbanders of the pigs. The difference between the owner and doer is also applicable to compounders. Therefore, *to include owners and doers the program needs to customize the course curriculum and implementation based on the differences.* A final insight that came out of the l@s study was that *the users need to be sensitized that pig production is directly related to the inputs (feed), as a machine needs fuel.* Most of the users of the program do not have this understanding, which can be a negative factor for increasing the impact of the program at scale.



**EIGHT NOVEL COMPONENTS ARE
SIGNIFICANT FOR THE PERFORMANCE
OF THE PROGRAM IN ACHIEVING
IMPACT AT SCALE.**

Readiness and use of the training and certification program

Scaling readiness of an innovation is the first metric used to assess the impact potential of the individual innovation. It focuses on the single innovation that is placed in the core of the intervention and provides a holistic picture of the relative maturity and actual use of the elements of the innovation within a specific context. Within the scope of this report, it is the first measure to assess the potential impact of the training and certification program at scale by providing detailed information on its eight elements presented in the innovation profile sheet above. (For descriptions of the measures, please see the scaling readiness lexicon).

I@S prepared a scaling readiness assessment for the training and certification program by using the combination of the judgement of the experts who were interviewed (narrative evidence) and evidence resources that can be accessed by the I@S team (documented evidence).²

Figure 1: Scaling readiness assessment of the program for Uganda, September 2020, Productive and Safe Pig Feed

The training and certification program has

5

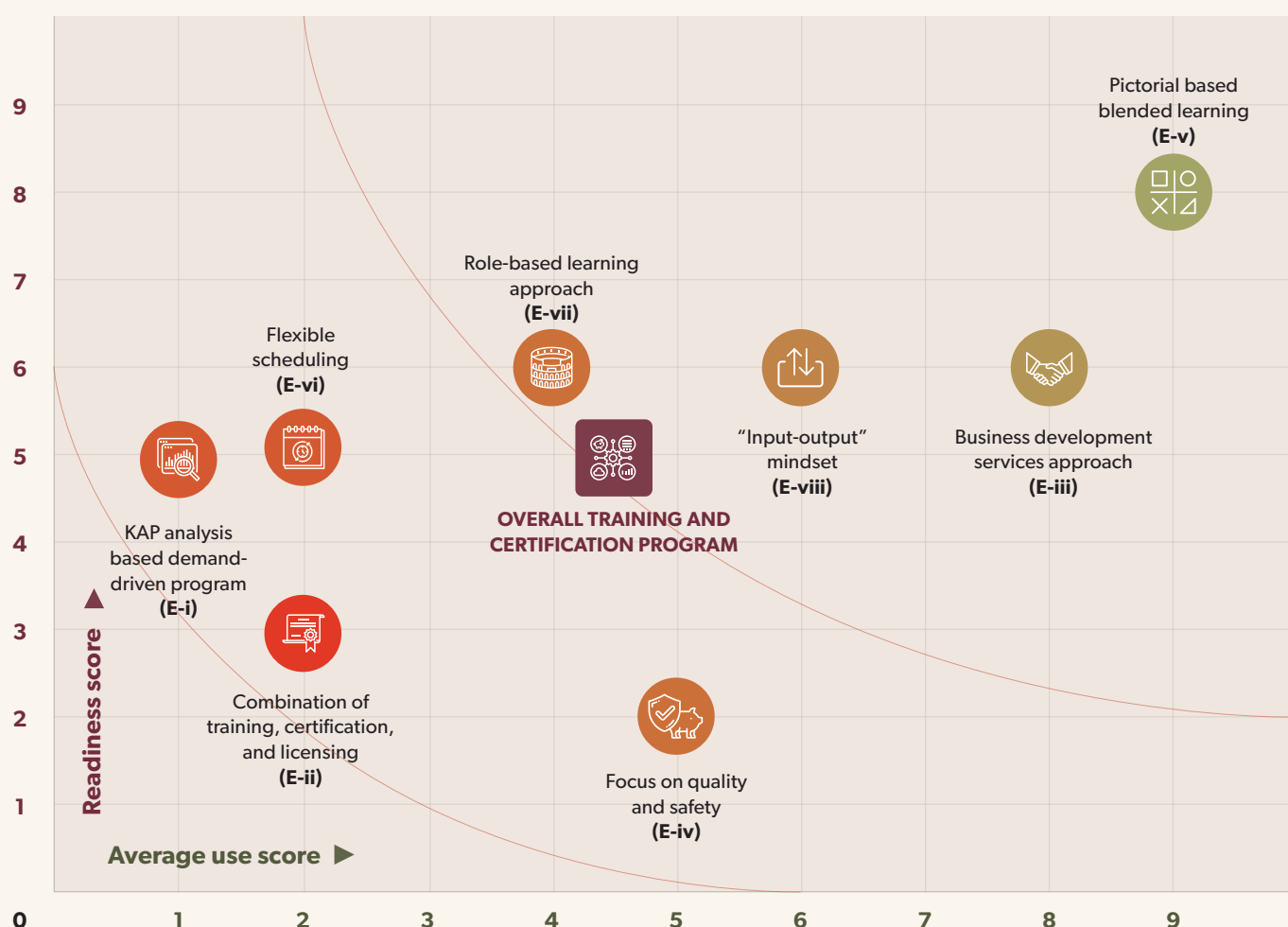
Average readiness score

4.5

Average use score

22.5

Scaling readiness average score



2. The scaling readiness assessment will be updated after completing the documentation of the evidence on the training and certification program in the Ugandan context. For details about the evidence approach, please see the scaling readiness lexicon.

Scaling readiness assessment of the elements of the training and certification program in September 2020, in the Ugandan context for achieving a more productive and safe pig feed indicates that the elements vary in terms of their readiness (their functional performance) and use (their actual use in the Ugandan context). Pictorial blended learning and business development services approaches are considered by the experts to function better and have larger use in implementing training and certification programs in Uganda (Figure 1). Whereas, combining training, certification and licensing in a single program is just a conceptual model for achieving highly productive and safe pig feed and has not been used in the pig or a similar sector in Uganda before.

To improve the impact of the training and certification program at scale, the component is currently advised to:



Innovation package profile for training and certification program

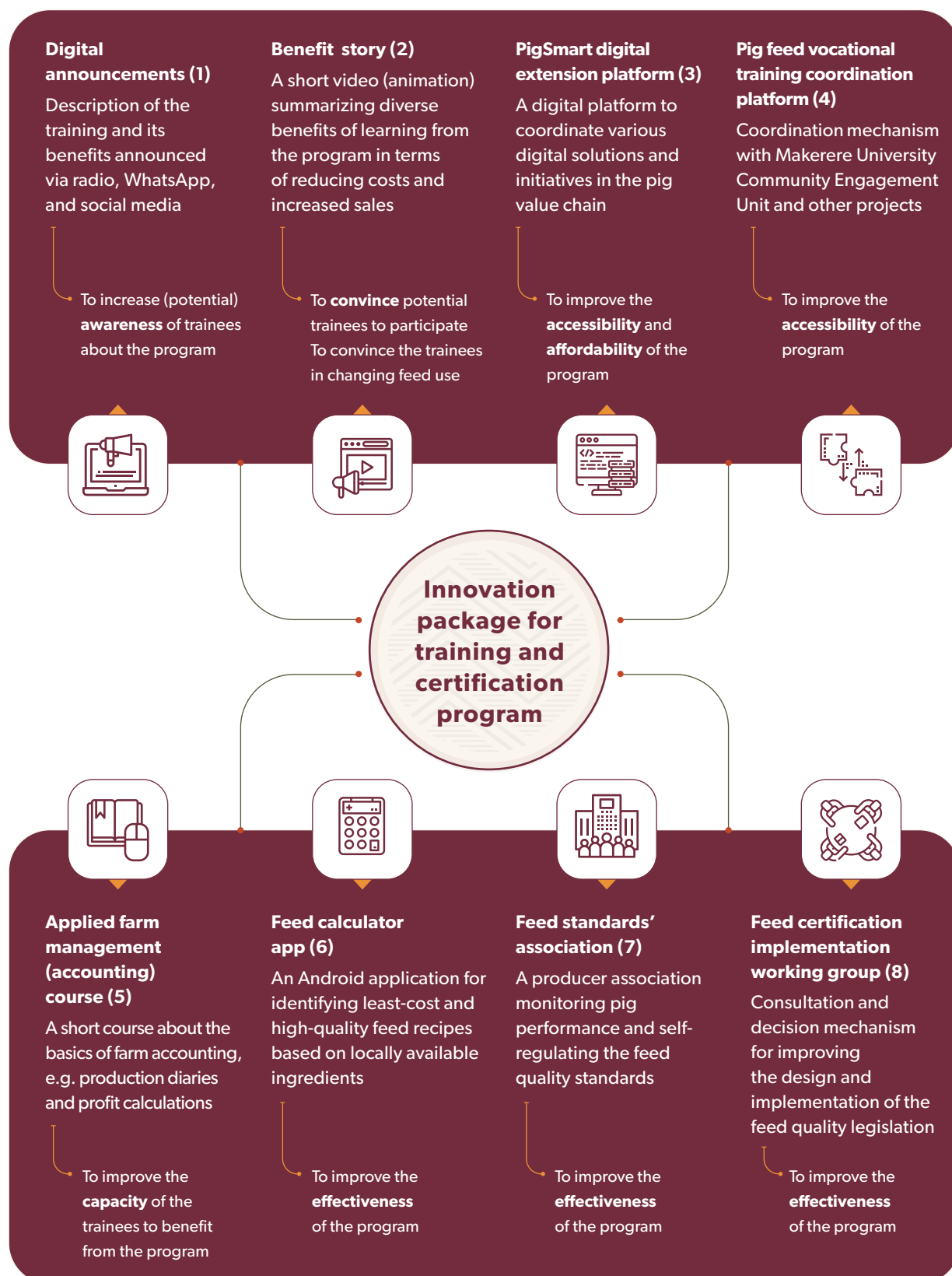
Scaling readiness innovation package profile³ is a tool to describe other innovations necessary to use an innovation at scale. Innovations cannot be used at scale without other innovations complementing its use (Sartas et al. 2020). For instance, a machine cannot achieve use at scale without complementary energy infrastructure, the best practices about how to use it etc. Scaling readiness innovation package profile aims to improve the performance of an intervention through i) helping to identify other innovations systematically; and ii) developing a shared understanding between the project managers, designer, developer, disseminators and use partners about their complementary roles. In this report, an innovation package profile is used to identify other innovations necessary to use “Training and certification program” at scale. In this section, i) the innovation package sheet; ii) an overall diagnosis of the configuration of the innovation package sheet; and iii) innovation readiness and used assessments of the innovation package are provided.



SCALING READINESS
INNOVATION PACKAGE
PROFILE AIMS TO IMPROVE THE
PERFORMANCE OF AN INTERVENTION.

3. “Innovation Package” is a concept of the Scaling Readiness and has a particular meaning described in the Scaling Readiness Lexicon. Although it overlaps with the “Intervention Package” notion of the Livestock CRP Priority Country Project plan, it differs from it in multiple ways. In this report, the package refers to the innovation package of Scaling Readiness.

Innovation package sheet



Diagnosis of the innovation package

This part provides information about the diagnosis of the I@S team on the innovations presented in the innovation package sheet.

AWARENESS ABOUT THE TRAINING AND CERTIFICATION PROGRAM AT SCALE



The training and certification program is a component of the integrated intervention package of the Livestock CRP Priority Country Project plan and is known by the broader team involved in the project. In addition, since the component has a partnership with Makerere university, some of the other experts working in the pig sector might have learned about the program. However, the study done by the I@S showed that information about the training and certification program has not been sufficiently available outside of the organizations participating in its implementation. Since awareness about the program is a key requirement for the program to be used at scale, an innovation aiming to improve the awareness of the program among its potential users needs to be added to the innovation package. Our findings suggest that the most effective way to increase awareness of the users in Uganda is using **digital announcements (1)** especially WhatsApp and other social media.

BEING CONVINCED ABOUT THE BENEFITS OF TRAINING AND CERTIFICATION PROGRAM AT SCALE



I@S study indicated that although experts in the pig sector are convinced about the benefits of the training and certification program, its users are not sufficiently convinced. Increased productivity and profitability gains articulated in the project plan are not sufficiently known or presented in a convincing way to the potential participants of the program. Since the potential participants of the program are motivated “**watching rather than reading books**” as indicated by one respondent, an effective way to convince potential users of the program is to create a **benefit story (2)**, a short video or an animation summarizing diverse benefits of learning from the program in terms of reducing costs and increased sales.

ACCESSIBILITY OF THE TRAINING AND CERTIFICATION PROGRAM AT SCALE



The project plan and various studies done in Uganda showed that improved feed can contribute to a very high number of stakeholders involved in pig production. However, i) the geographical spread of these stakeholders is high, ii) the number of trainers who can provide relevant training are limited relative to the potential users of the program and iii) the number of potential users are increasing fast due to population dynamics. This implies that the program might not be accessible to a large share of its potential users. To increase accessibility, decentralized solutions and coordination with other training services can be effective. Another component of the project plan, **PigSmart Digital Extension Platform (3)**, can be a very good decentralized solution for improving the accessibility of the content of the training and certification program. In addition, a **Pig Feed Vocational Training Coordination Platform (4)**, a coordination mechanism with Makerere University Community Engagement Unit and other initiatives providing vocational training in the pig sector such as Management Training and Advisory Center (MTAC) can increase the synergies between the program and similar training and certification initiatives. Combined they can significantly contribute to the impact of the training and certification program.



THE POTENTIAL PARTICIPANTS OF THE PROGRAM ARE MOTIVATED “WATCHING RATHER THAN READING BOOKS”.

AFFORDABILITY OF THE TRAINING AND CERTIFICATION PROGRAM AT SCALE



Initially, the cost of the program will be covered by the component. Following the completion of the development of the program, interested users will be asked to cover their own cost. However, in the absence of very favorable pig prices and significant improvement in value distribution in the pig sector, the share of potential participants who can afford the costs will be small. As it was shown for the dairy sector in Kenya and Tanzania, the cost can be prohibitively high for a large group of producers (Blackmore et al. 2020). To decrease the cost, some cost effective solutions need to be implemented. **PigSmart digital extension platform (3)**, can be such a cost effective solution. Once the training materials are finalized they can be digitized and be offered to potential users with minimal costs.

CAPACITY OF THE USERS TO BENEFIT FROM THE TRAINING AND CERTIFICATION PROGRAM AT SCALE



One of the implicit assumptions of the current design of the training and certification program is that potential users are sufficiently literate in calculating input and output costs and have the habit of record keeping that will enable them to use existing feed mix calculation tools (conventional or digital). However, I@S study indicated that this implicit assumption is not applicable to the majority of the users in the current pig value chain in Uganda (Mulindwa et al. 2016). Without increasing the literacy of the potential users in topics such as basics of farm accounting, e.g. production diaries and profit calculations, the contribution of the training to impact at scale will be very limited. **A short applied management (accounting) course (5)** before the program can improve the capacity of the users to benefit from the program significantly. This course can be organized just for the component or it can be co-organized with the component which works on the market arrangement.

EFFECTIVENESS OF THE TRAINING AND CERTIFICATION PROGRAM AT SCALE



The innovations described above can contribute to positive impact at scale in Uganda. I@S study indicated that a few other innovations can improve the effectiveness of the program and lead to further improvements in the impact at scale. One of these innovations is **feed calculation app (6)**, The app is an Android OS based smartphone application that is used for identifying least-cost and high-quality feed recipes based on locally available ingredients. The app can improve the efficiency of the training and provide more space for covering other key topics in the program such as farm enterprise management, effective business partnerships etc.

A second innovation is **feed standards association (7)**. Studies in the Ugandan pig sector, the project plan and the I@S study showed that sustaining the prestige and privileges of the certificate will need continuous monitoring and mitigation measures against “fake feeds” (Ochieng et al. 2016) and counterfeit certificates. I@S study also showed that the most likely successful solution for such monitoring and mitigation is self-organized feed standards association consisting of pig feed producers. Similar to the dairy sector in Uganda such an association can increase the effectiveness of the program significantly.

A third innovation that can increase the effectiveness is **feed certification implementation working group**, a consultation and advisory mechanism for improving the design and implementation of the feed quality legislation. It includes the Uganda National Bureau of Standards (UNBOS), Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), National Drug Authority, Ministry of Trade, Industry and Cooperatives (MTIC), managers of international and national funded pig feed initiatives, farmers associations and the feed standards association mentioned in the previous paragraph. The working group will support consolidation of the gains done by the training and certification program and increase its effectiveness.

Scaling readiness of the innovation package

Scaling readiness of an innovation package is the final metric used to assess the impact potential of all the innovations together including the individual innovation, i.e. training and certification program and other innovations presented in the innovation package sheet above. The scope of the scaling readiness of the innovation package goes beyond the training and certification program elements, which are in the sphere of control for the component and informs about the situation in the sphere of influence. The scaling readiness assessment of the innovation package considers all of the eight other innovations as well as the program.

I@S prepared the scaling readiness assessments for the innovation package by using the combination of the judgement of the experts who were interviewed (narrative evidence) and evidence resources that can be accessed by the I@S study (documented evidence).⁴

Figure 2: Scaling readiness assessment of the training and certification innovation package for Uganda, September 2020, Productive and Safe Pig Feed

The innovation package has

5.72

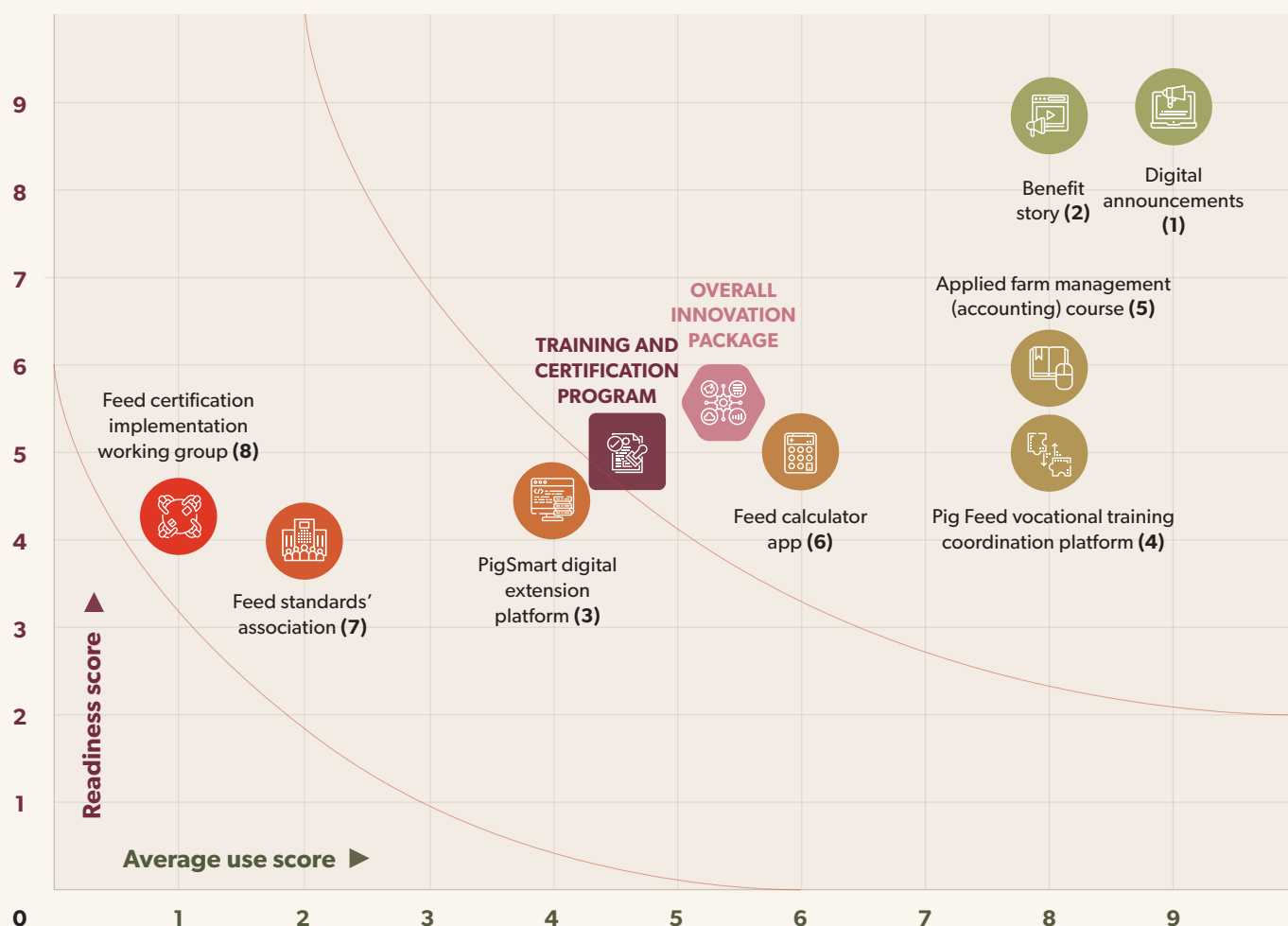
Average
readiness score

5.76

Average
use score

32.4

Scaling readiness
average score



4. The Scaling Readiness assessment of the innovation package will be updated after completing the documentation of the evidence for the Ugandan Context. For details about the evidence approach, please see the Scaling Readiness Lexicon.

Scaling readiness assessment of the innovation package in September 2020, in the Ugandan context for achieving a more productive and safe pig feed, shows big variability among different innovations constituting the innovation package. Digital announcement and benefit stories are shown to work in Uganda in uncontrolled conditions and commonly used by users who are not part of the study for development projects, thus have high readiness and use scores. Meanwhile, feed standards association and certification implementation groups are currently at their design stage and not used by any users outside of the component team.

To improve the impact of the training and certification program at scale, the component is currently advised to:

1

Study the experience of a feed **certification implementation group** (8) in similar contexts to Uganda and prepare a plan for establishing a group/for supporting an existing group with a similar mandate

2

Share the plan of the implementation group with the partners of the component and other organizations working in the feed sector

3

Study the experience of **feed standards associations** (7) in a similar context (such as dairy association in Uganda) and prepare an organizational establishment statement as well as a business plan for a new association/for updating organizational structure and business plans of existing suitable associations that can fulfill tasks required for feed standards monitoring and enforcement

4

Share the establishment and business plans with the partners of the component and other organizations working in the feed sector

5

Support testing of PigSmart **digital extension platform** (3) and its dissemination to stakeholders working on extension in the pig sector



Strategic plan for improving the impact of training and certification program at scale

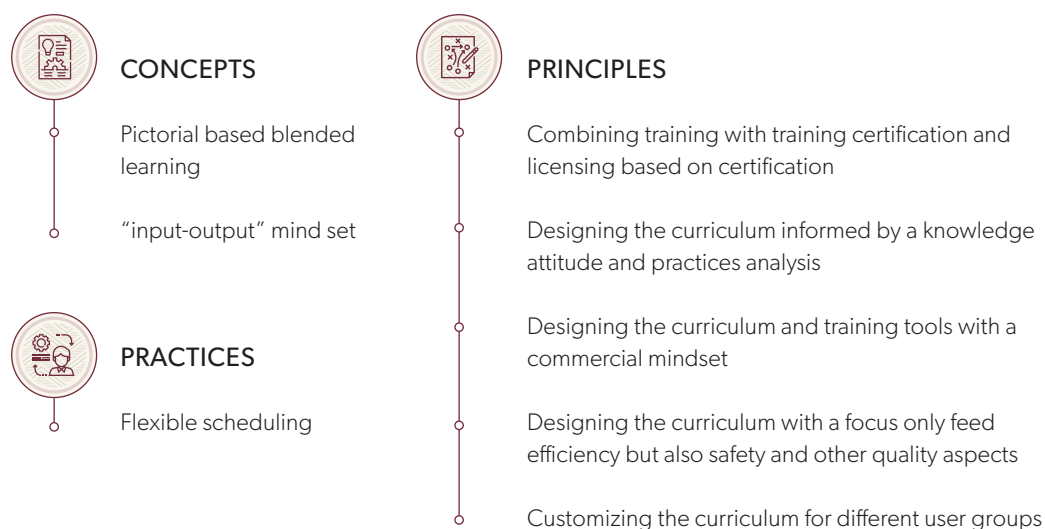
What is this strategic plan?

Scaling readiness scaling strategy combines the results of the diagnosis with strategic options⁵. It presents the optimum strategy given the characteristics of interventions operating in a target sector, the innovations that have the best potential to achieve impact at scale, the configuration of the stakeholder networks working on the innovations and constitute the intervention team. In this report, we present a customized version of the scaling strategy we refer to as the **strategic plan**.

The strategic plan builds upon the previous sections of the report. It bridges the diagnosis presented previously in this report and the actions necessary to achieve impact at scale effectively and efficiently by answering key strategic questions important for the component to achieve impact at scale. It can be used as a first standalone document highlighting the strategic actions the component needs to take.

What does the component aim to scale?

The component aims to increase the use of the training and certification program at scale. The program will become a tested and validated **approach** for improving the quality, profitability and safety of pig feed. The approach is an innovation consisting of a collection of concepts, principles and practices including following the novel elements



The approach combining these concepts, principles and practices will be documented by a plan. The component aims to increase the use of this plan by different training agents, universities, extension agents, private sector service providers and digital platforms at scale in Uganda after the component is finished. In other words, the component aims to scale a plan with a novel approach.

5. Strategic options are a set of hierarchical options that an intervention can pursue. It lists the options from most cost efficient to least efficient. More information can be found in the scaling readiness paper (Sartas et al. 2020)

What is the scaling objective and scaling vision of the component?

The overall objective of the component is to contribute to the increase in the use of higher quality and safe pig feed by 100 feed compounders, extensionists and lead farmers in Uganda as a part of the broader project. Its specific scaling objective is to increase the use of the **plan** by eight tertiary courses, 12 extension courses, 12 private service providing organizations and digital extension programs outreaching at least 200 feed compounders, extensionist and lead farmers in Uganda.

The vision of the component is to increase the use of the **plan** by

1



Increasing the awareness of 10 organizations and informal groups about the plan

2



Convince 10 organizations and informal groups to use it in their extension services

3



Increase the accessibility of the plan to 5 disadvantaged organizations or informal groups

4



Decrease the cost of provision of feed mixing training by 5–30%

5



Increase the capacity of 200 feed compounders, extensionist and lead farmers in other subjects complementary to the feed use



What do we recommend the component work on now?

To improve the use of the training and certification plan (presenting the novel approach) in Uganda in September 2020 onwards for improving food quality and safety, in an effective and efficient way, we suggest working on the following tasks. The tasks that have (P) in the beginning, are the priority tasks. They aim to improve the innovations or elements of the program that have relatively low readiness and use score (Figure 2).

1 (P) Studying the experience of feed certification implementation group in similar contexts to Uganda and prepare a plan for establishing a group/for supporting existing group with a similar mandate

3 (P) Sharing the plan of the implementation group with the partners of the component and other organizations working in the feed sector

5 (P) Supporting testing of PigSmart digital extension platform and its dissemination to stakeholders working on extension in the pig sector

7 Designing a curriculum combining the results of KAP analysis with flexible scheduling and “input-output” approach

9 Converting the conceptual business model of combining training, certification and licensing (Livestock CRP Priority Country Project 2019–2021, P.8) into an application model by detailing the business plan and later testing

11 Collaborating with other organizations or projects providing role-based training in Uganda pig value chain to sensitize Makerere university and national extension systems trainers on the advantages of role-based training

2 (P) Studying the experience of feed standards associations in a similar context (such as dairy association in Uganda) and prepare an organizational establishment statement as well as a business plan for a new association/for updating organizational structure and business plans of existing suitable associations that can fulfill tasks required for feed standards monitoring and enforcement

4 (P) Sharing the establishment and business plans with the partners of the component and other organizations working in the feed sector

6 Creating learning on how focusing on quality and safety aspects in feed production training can be translated into commercially viable and superior feed mixes in Uganda by synthesizing existing literature

8 Converting the conceptual business model of combining training, certification and licensing (Livestock CRP Priority Country Project 2019–2021, P.8) into an application model by detailing the business plan and later testing

10 Presenting the curriculum combining the results of KAP analysis and flexible scheduling to other components of the Livestock priority country project and other initiatives working on the feed in the R4D sector



Photo: ILRI/Elisabeth Kilian

Which stakeholders to work with now?

Not all of the tasks listed above can be provided effectively and efficiently by the team of the component. They require a set of competencies that go beyond the coverage of the component team. Considering the nature of the tasks the following competences it is necessary to combine research and analytical competences with educational management, innovation management, organization management and other competences. Especially, the following competences can be important assets for achieving impact at scale.

Task Number	Competences
1	Vocational training design, feed quality, feed safety, analytical writing
2	Vocational training design, education management, feed certification, quality management, applied vocational training, analytical writing
3	Curriculum design, KAP assessment, education management, input-output analysis, farm management
4	Research communication, innovation brokerage, interpersonal skills, feed sector experience
5	Educational communication, innovation brokerage, interpersonal skills, feed production
6	Vocational education, feed production, farm organizations management, agricultural extension best practices
7	Stakeholder management, analytical writing, action research
8	Research communication, innovation brokerage, interpersonal skills, feed sector experience
9	Basic research skills, agricultural production organizations, quality management, business plans
10	Effective communication, innovation brokerage, interpersonal skills, feed sector experience
11	User experience design, feed sector experience

The component needs to prioritize the work with the stakeholders who have these competences. A more detailed answer to *who to work with* requires an analysis of the stakeholder networks in Uganda. Such a study is a part of the partnership management module currently being developed by I@S and can be provided in the later stages of the implementation of the component.

Evidence appendix for ILRI training and certification program

Description

The [Scaling readiness report](#) for piloting and evaluating a training and certification model includes two scaling readiness assessments of the content of the project under the name “[Piloting and evaluating a training and certification business model to improve feed quality from small scale commercial feed producers](#).” This evidence appendix provides a detailed explanation of the readiness and use levels of each of the elements of the program and the innovations in the associated innovation package. It also links the report to the broader science and technical documentation of scaling readiness. *It uses the terminology of the scaling readiness approach*, which is not always presented in the scaling assessment report to make the report more accessible to the general reader. Scaling readiness terminology referred to in this evidence appendix is italicized to help readers establish a link with existing scaling readiness publications.



Scaling readiness assessment of the innovation

The core innovation of the project is a **training and certification program**. The project aims to increase the use of training and a certification program in Uganda (a specific location) to improve the quality and safety of the pig feed (for a specific goal) in 2020 and beyond (in a specific time). The innovation type of the program is an approach. Among all the other **components** described in the project description in the [Livestock CRP Priority Country Project Plan](#), the program includes two concepts, five principles, and a practice. The combination of these concepts, principles, and practice makes the program novel, i.e. it makes the program an approach type of innovation.

Each of these eight components have different readiness and use scores as presented in Figure 1 (blue circles). The average of these eight components is also presented as an indicator of the overall readiness and use (red circle). Average of the readiness and use is one of the indicators used for scaling readiness although it is not the one used in the standard scaling readiness approach. Specific assessment of readiness and use are provided below.

Figure 1: Scaling readiness assessment of the program for Uganda, September 2020, Productive and Safe Pig Feed

The training and certification program has

5.13

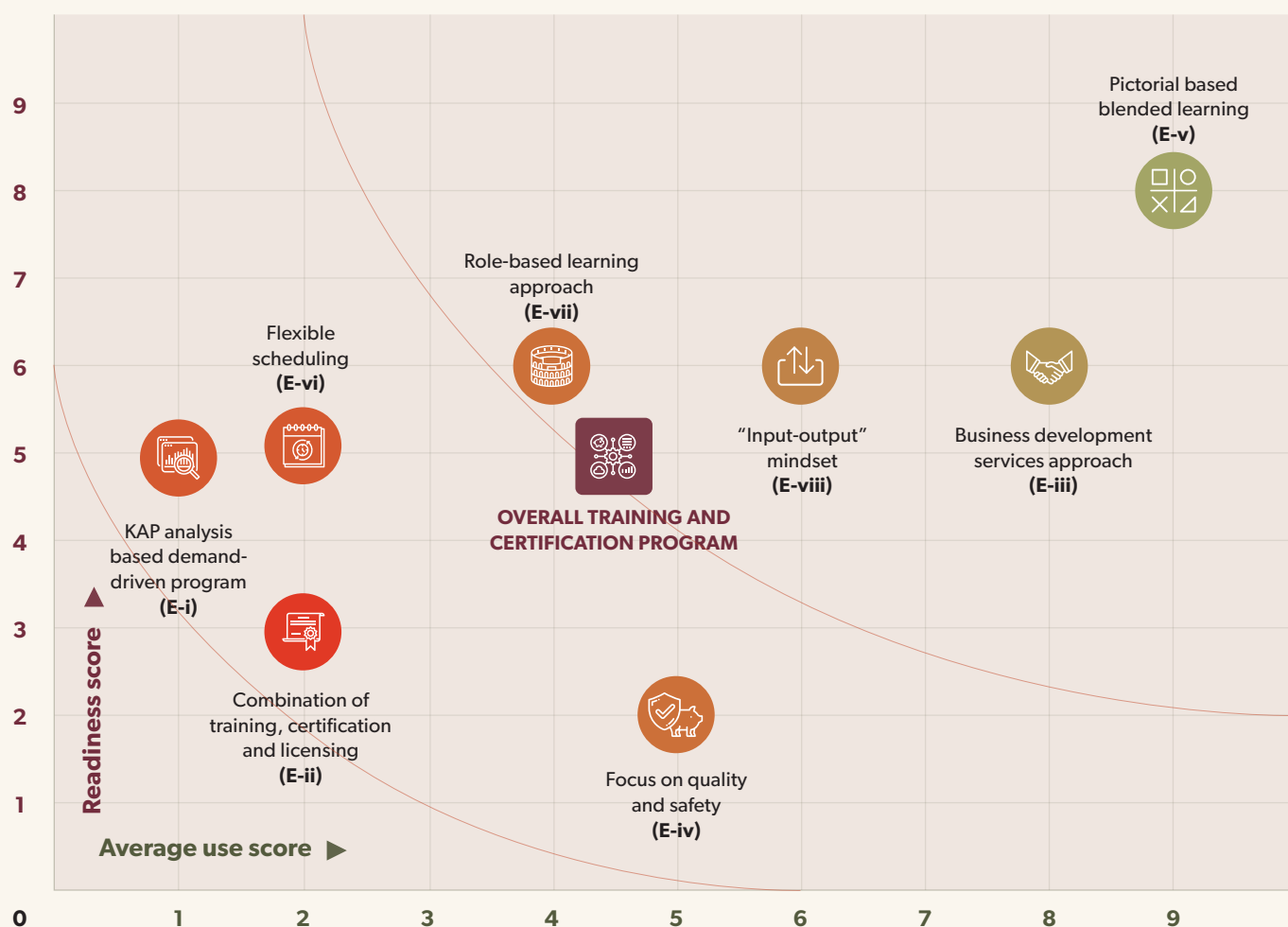
Average readiness score

4.63

Average use score

23.7

Scaling readiness score



2. The scaling readiness assessment will be updated after completing the documentation of the evidence on the training and certification program in the Ugandan context. For details about the evidence approach, please see the scaling readiness lexicon.

COMBINING TRAINING, CERTIFICATION AND LICENSING TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The principle of combining training of pig aggregators with training certification and licensing aggregators based on certification has a readiness score of 3 and use score of 2. It has a readiness score of 3 because the combination has been validated conceptually in a generic way. A systematic review done by Oya and his colleagues show that “legalized certification supported by training increases prices and income from produce in agricultural production on socio-economic outcomes in low and middle-income countries” (Oya et al. 2017). Also the combination was shown to be effective in increasing food safety in some cases for the dairy industry in Kenya (Blackmore et al. 2020). However, neither the desktop research nor the interviews l@S conducted could identify an evidence source validating the concept in applied literature or in Uganda pig sector context. The use score of the principle is 2 because some of the partners l@S interviewed are aware of it. However, not all of them are aware therefore, it is not 3 or more.

DESIGNING THE CURRICULUM INFORMED BY A KNOWLEDGE ATTITUDE AND PRACTICES (KAP) ANALYSIS TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The principle of designing the curriculum informed by a knowledge attitude and practices analysis has a readiness score of 5 and use score of 2. It has a readiness score of 5 because using KAP analysis for curriculum design has been argued to lead to better design of training and improve the knowledge (Dione et al. 2020). It has also been shown in the Ugandan pig value chain context that such training design did not improve the knowledge in the short term. However, Dione et al. (2020) also has shown that “knowledge is not the binding constraint to uptake of biosecurity practices for disease prevention or control”. Therefore, although the design of the program is considered effective, the application based on the design has not contributed to better knowledge due to some other factors that are not systematically reported by Dione et al. The use score of the principle is 1 because none of the partners l@S interviewed are aware of it.

FLEXIBLE SCHEDULING OF THE PROGRAM TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The practice of flexible scheduling of the training has a readiness score of 5 and use score of 2. It has a readiness score of 5 because flexible scheduling for vocational training was shown to be one of the critical requirements for “a more flexible program of course offerings that was sensitive to varying and constantly changing local needs and market signals” (Ishumi 1988; Okware and Ngaka 2017). However, the use of scheduling was not one of the critical factors referred to in the studies on vocational education studies done in Uganda (Moses 2016). The use score of the principle is 2 because some of the partners l@S interviewed are aware of it. However, not all of them are aware therefore, it is not 3 or more.

PROVIDING A ROLE-BASED TRAINING OR CUSTOMIZING THE CURRICULUM FOR SEPARATE GROUPS TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The principle of role-based training provision has a readiness score of 6 and use score of 4. It has a readiness score of 6 because there are multiple applied studies arguing for the need of customization of the training for different groups in sub-Saharan Africa (Acker 1988; Johanson and Adams 2004; Moock 1984) and in Uganda (Jjuuko et al. 2019). In addition, interviewees mentioned the use of role-based training in different livestock sectors in Uganda, i.e. indicating that the application model is proven generically. However, there is no study presenting evidence on the benefits of the principle in the pig sector. The use score of the principle is 4 because one of the interviewees who are not involved in the project has referred to the implementation of the principle in Uganda.

DESIGNING THE CURRICULUM WITH A FOCUS ONLY FEED EFFICIENCY BUT ALSO SAFETY AND OTHER QUALITY ASPECTS TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The principle of designing the curriculum with a focus not only feeds efficiency but also safety and other quality aspects has a readiness score of 2 and use score of 5. It has a readiness score of 2 because I&S study could not identify any proven models combined curriculum approach either in the published resources or by the result to the question asked in the interview. The use score of the principle is 5 because both two of the interviewees who are not involved in the project have referred to the implementation of the principle in their innovation related work in Uganda.

INPUT-OUTPUT BASED CURRICULUM TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The concept of designing the curriculum by presenting pigs as a transformer of the quality of the feed they eat has a readiness score of 6 and use score of 6. It has a readiness score of 6 because using an input-output concept in the curriculum for vocational training was shown to be effective (Jagwe et al. 2015) and there are a few interventions implementing it in Uganda. However, there is no systematic evidence documented proving its successful application. The use score of the concept is also 6 since existing implication of the principle goes beyond the partners of the project.

DESIGNING THE CURRICULUM AND TRAINING TOOLS WITH A COMMERCIAL MINDSET TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The principle of designing the curriculum and training tools with a commercial mindset has a readiness score of 6 and use score of 8. It has a readiness score of 6 because using a commercial mindset in the curriculum for vocational training was shown to be effective in multiple sources (Jagwe et al. 2015; Okware and Ngaka 2017; Oya et al. 2017). However, these resources were not in the pig sector. The use score of the principle is 8 because all the interviewees stated that although the majority of the compounders and pig producers are not fully commercial oriented, there is a significant number of them who operate in the pig sector and provide high quality and relatively safe pig feed.

PICTORIAL BASED BLENDED LEARNING TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020



The concept of pictorial based blended learning has a readiness score of 8 and use score of 9. It has a readiness score of 8 because using pictorial blended learning in the curriculum for vocational training was shown to be effective in multiple sources including the ones in Uganda. (Atieno 2013; Jagwe et al. 2015; Karubanga et al. 2017). However, the sources arguing for pictorial based learning did provide the early results during the implementation of a project but not independently generated evidence in real conditions. The use score of the concept is 9. All of the interviews and some literature sources, e.g. Karubaha et al. (2017) has mentioned that pictorial based blended learning is a common practice for learning in the pig value chain in Uganda (Atieno 2013; Karubanga et al. 2017)

Scaling readiness assessment of the innovation package

The innovation package of the project is a collection of training and certification program and all other innovations that are necessary to use the program in Uganda (a specific location) to improve the quality and safety of the pig feed (for a specific goal) in 2020 and beyond (in a specific time). The package consists of multiple innovations. Some of the other innovations in the innovation package are included in the project description in the [Livestock CRP Priority Country Project Plan](#). Some others are identified by the I@S study.

The innovation package of the training and certification program has nine innovations. In addition to the program, there are two communication innovations, i.e. digital announcements and benefit story, two technologies, i.e. PigSmart digital extension platform and feed calculator app, one educational innovation, i.e. applied agribusiness management course and three organizational innovations, i.e. vocational training coordination platform, feed standard's association and Feed certification implementation working group.

The average of these nine innovations is presented as an indicator of the overall readiness and use score of the package (purple circle) (Figure 2). For comparison, the readiness and use of the training and certification program are colored by red. Average scaling readiness score of the package is 32.4.

Figure 2: Scaling readiness assessment of the training and certification innovation package for Uganda, September 2020, Productive and Safe Pig Feed

The innovation package has

5.78

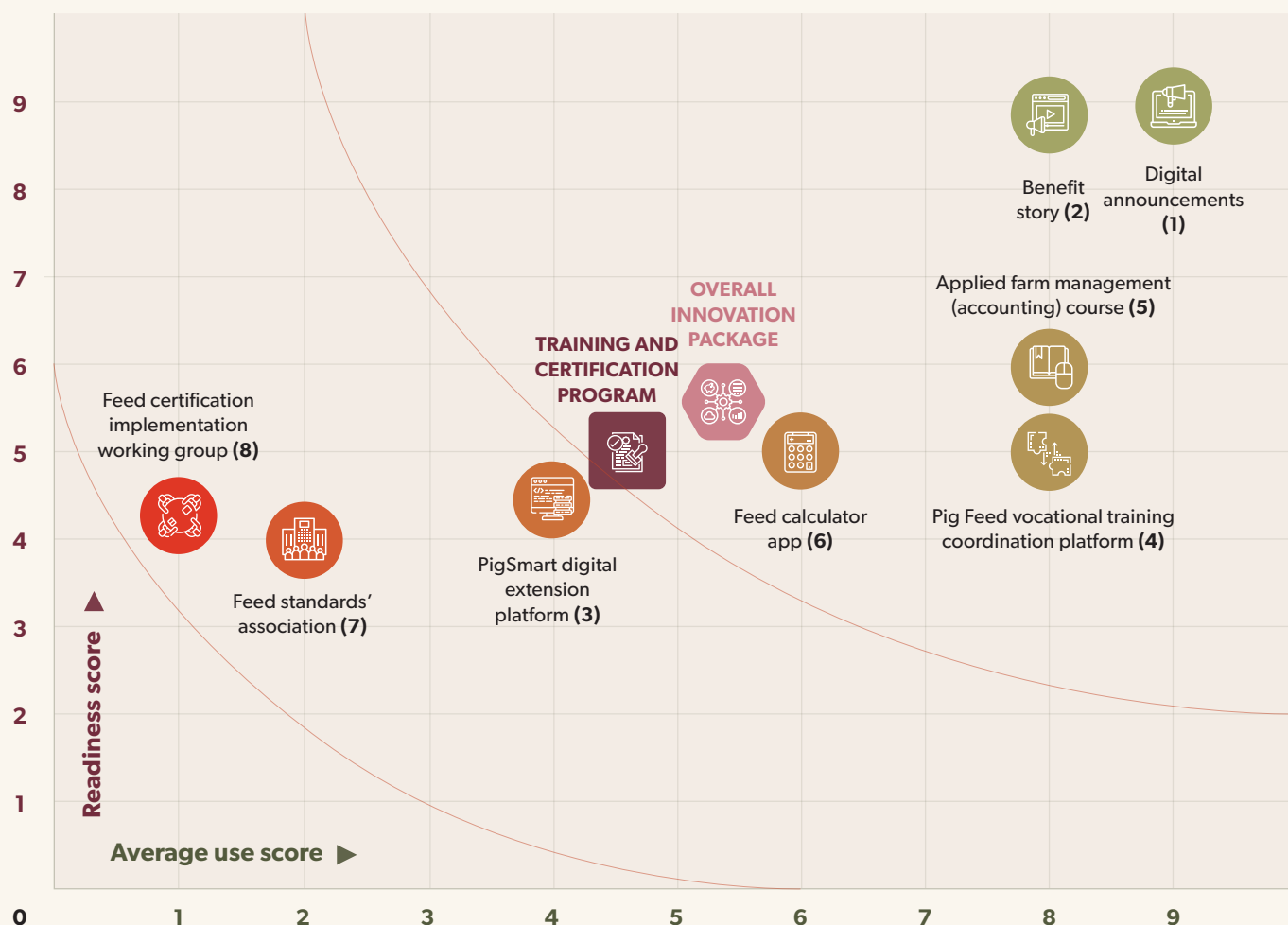
Average
readiness
score

5.63

Average use
score

32.5

Scaling readiness
score



4. The Scaling Readiness assessment of the innovation package will be updated after completing the documentation of the evidence for the Ugandan Context. For details about the evidence approach, please see the Scaling Readiness Lexicon.



FEED CERTIFICATION IMPLEMENTATION GROUP TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

Feed certification implementation working group, a consultation and advisory mechanism for improving the design and implementation of the feed quality legislation has a readiness score of 4 and use score of 1. It has a readiness score of 4 because there is generic evidence showing that using feed certification groups have positive contributions to quality and food safety especially in the aquaculture sector (Mariojouis et al. 2019; Tran et al. 2013). However, they are not supported by applied science evidence for the pig sector. It has a use score of 1; none of the interviewees who are outside of the project team are aware of such an implementation group.



FEED STANDARDS ASSOCIATION TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

Feed standards association, a continuous monitoring and enforcement association has a readiness score of 4 and use score of 2. It has a readiness score of 4 because there is generic evidence showing that using feed certification groups have positive contributions to improve quality and food safety (Enting et al. 2010; Trienekens and Zuurbier 2008). However, they are not supported by applied science evidence for the pig sector. It has a use score of 2; one of the partners of the project team was aware of the use of such an implementation group.



PIGSMART DIGITAL EXTENSION PROGRAM TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

PigSmart Digital extension platform, a cost efficient solution for learning, has a readiness score of 5 and use score of 4. It has a readiness score of 5 because Atieno suggested that “more farmers use ICT to learn about agricultural and other development information in Uganda” (Atieno 2013). However, this claim was not validated in an applied way. It has a use score of 4, as PigSmart has been used by some of the platform developers who are not involved in the project but connected to the effective partners of the project (Lukuyu et al. 2020).



FEED CALCULATOR APP TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

Feed calculator app, an Android OS based smartphone application that is used for identifying least-cost and high-quality feed recipes based on locally available ingredients, has a readiness score of 5 and use score of 6. It has a readiness score of 5 because in addition to the Atieno’s proposition that “more farmers use ICT to learn about agricultural and other development information in Uganda” (Atieno 2013), the app was shown to for other livestock in Benin and beyond (Bosma et al. 2019). However, this claim was not validated in an applied way for pig. It has a use score of 6, as it is used by some experts who are not involved in the project and not connected to the effective partners of the project.



VOCATIONAL TRAINING CERTIFICATION PLATFORM TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

A vocational training certification platform, a coordination mechanism with Makerere University Community Engagement Unit and other initiatives providing vocational training, has a readiness score of 5 and use score of 8. It has a readiness score of 5 because application models of vocational training certification platforms are shown to contribute to reaching standards (Preece 2017). However, the validation was not done for the pig sector. The use score of vocational training certification program is 8, because all the interviewees stated that although there are examples of collaboration for certification between Makerere university and other actors in Uganda.



APPLIED AGRI-BUSINESS MANAGEMENT (ACCOUNTING) COURSE TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

Applied agri-business management courses with accounting has a readiness score of 6 and use score of 8. It has a readiness score of 6 because an agri-business management course was argued to be effective outside of the Uganda context (Ulvenblad et al. 2020) and being tested in Uganda pig sector (Birungi et al. 2015; Jagwe et al. 2015; Lukuyu et al. 2017; Tatwangire 2013). The use score of the principle is 8 because all the interviewees stated that agri-business training is used in the pig sector by some actors who are not involved in research and development projects.



PROGRAM BENEFIT STORY TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

A benefit story, a short video or an animation summarizing diverse benefits of learning from the program in terms of reducing costs and increased sales, has a readiness score of 8 and use score of 9. It has a readiness score of 8 because it is an application of pictorial blended learning materials shown to be effective in multiple sources including the ones in Uganda. (Atieno 2013; Jagwe et al. 2015; Karubanga et al. 2017). However, the sources arguing for pictorial based learning did provide the early results during the implementation of a project but not independently generated evidence in real conditions. The use score of the concept is 9. All of the interviews and some literature sources, e.g. Karubaha et al. (2017) mentioned that video based learning is a common practice for learning in the pig value chain in Uganda (Atieno 2013; Karubanga et al. 2017).



DIGITAL ANNOUNCEMENTS TO IMPROVE QUALITY AND SAFETY OF PIG FEED IN UGANDA IN 2020

Digital announcement on the specifics of the program has a readiness and use score of 9. It has a readiness score of 9 because use of social media and WhatsApp is shown to be effective in announcing quality and safety information in Uganda (Bailur and Schoemaker 2016; Pindayi 2017). It has also a use score of 9 as digital announcement is considered one of the most effective means in Uganda for public information including quality and safety information for feed.

Annex 1: Innovation readiness levels (Sartas et al. 2020)

Innovation readiness score	Innovation readiness level	Description	Type of science	Type of evidence
0	Idea	Genesis of the innovation. Formulating an idea that an innovation can meet a specific goal.	None	None
1	Hypothesis	Conceptual validation of the idea that an innovation can meet specific goals and development of a hypothesis about the initial idea.	Conceptual	Generic
2	Basic Model (unproven)	Researching the hypothesis that the innovation can meet specific goals using existing basic science evidence.	Conceptual	Generic
3	Basic Model (proven)	Validation of principles that the innovation can meet specific goals using existing basic science evidence.	Basic science	Generic
4	Application Model (unproven)	Researching the capacity of the innovation to meet specific goals using existing applied science evidence.	Basic science	Generic
5	Application Model (proven)	Validation of the capacity of the innovation to meet specific goals using existing applied science evidence.	Applied science	Generic
6	Application (unproven)	Testing of the capacity of the innovation to meet specific goals within a controlled environment that reflects the specific spatial-temporal context in which the innovation is to contribute to achieving impact.	Applied science	Generic
7	Application (proven)	Validation of the capacity of the innovation to meet specific goals within a controlled environment that reflects the specific spatial-temporal context in which the innovation is to contribute to achieving impact.	Applied science (controlled)	Specific to intervention context
8	Incubation	Testing the capacity of the innovation to meet specific goals or impact in natural/real/uncontrolled conditions in the specific spatial-temporal context in which the innovation is to contribute to achieving impact with support from an R4D.	Applied science	Specific to intervention context
9	Ready	Validation of the capacity of the innovation to meet specific goals or impact in natural/real/uncontrolled conditions in the specific spatial-temporal context in which the innovation is to contribute to achieving impact without support from an R4D.	Applied science (uncontrolled)	Specific to intervention context

Annex 2: Innovation use levels (Sartas et al. 2020)

Innovation use score	Innovation use level	Description
0	None	Innovation is not used for achieving the objective of the intervention in the specific spatial-temporal context where the innovation is to contribute to achieving impact.
1	Intervention team	Innovation is only used by the intervention team who are developing the R4D intervention.
2	Effective partners (rare)	Innovation has some use by effective partners who are involved in the R4D intervention.
3	Effective partners (common)	Innovation is commonly used by effective partners who are involved in the R4D intervention.
4	Innovation network (rare)	Innovation has some use by stakeholders who are not directly involved in the R4D intervention but are connected to the effective partners.
5	Innovation network (common)	Innovation is commonly used by stakeholders who are not directly involved in the R4D intervention but are connected to the effective partners.
6	Innovation system (rare)	Innovation has some use by stakeholders who work on developing similar, complementary or competing innovations but who are not directly connected to the effective partners.
7	Innovation system (common)	Innovation is commonly used by stakeholders who are developing similar, complementary or competing innovations but who are not directly connected to the effective partners.
8	Livelihood system (rare)	Innovation has some use by stakeholders who are not in any way involved in or linked to the development of the R4D innovation.
9	Livelihood system (common)	Innovation is commonly used by stakeholders who are not in any way involved in or linked to the development of the R4D innovation.

Annex 3: Evidence sources

1. Acker, D.G. 1988. *Relevance of US graduate education in agriculture to careers in agricultural development of East African agriculturalists*. (Available from https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/mg74qp74d) (Accessed 02 November 2020)
2. Atieno, R. 2013. *Lifelong Learning for Farmers (L3F) Initiative Implemented in Kenya and Uganda: Results of a Survey*. <http://oasis.col.org/handle/11599/580>
3. Bailur, S. and Schoemaker, E. 2016. *WhatsApp, Facebook and pakapaka: Digital lives in Ghana, Kenya and Uganda*. Africa at LSE.
4. Baltenweck, I., Poole, E.J., Galiè, A., Ouma, E.A. and Marshall, K. 2019. *Livestock and Fish value chain assessment toolkit, version 2*. <https://hdl.handle.net/10568/105608>
5. Birungii, R., Ouma, E., Brandes-van Dorresteyn, D., Kawuma, B. and Smith, J. 2015. *Pig marketing and institutional strengthening: Uganda smallholder pig value chain capacity development training manual*. ILRI Manual 11. Nairobi, Kenya: International Livestock Research Institute. <https://hdl.handle.net/10568/56688>
6. Blackmore, E., Guarín, A., Alonso, S., Grace, D. and Vorley, B. 2020. *Informal milk markets in Kenya, Tanzania and Assam (India): An overview of their status, policy context, and opportunities for policy innovation to improve health and safety*. ILRI Research Report 62. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/109797>
7. Bosma, R.H., van Veluw, S. and Meijer, P. 2019. *FeedCalculator, een app om rantsoenen voor vis te berekenen*. Aquacultuur.
8. Dione, M.M., Dohoo, I., Ndiwa, N., Poole, J., Ouma, E., Amia, W.C. and Wieland, B. 2020. Impact of participatory training of smallholder pig farmers on knowledge, attitudes and practices regarding biosecurity for the control of African swine fever in Uganda. *Transboundary and Emerging Diseases*. 7 <https://doi.org/10.1111/tbed.13587>
9. Dror, I. and Wu, N. 2019. *Uganda pig value chain scaling workshop: Summary and next steps*. Presented at the Uganda Pig Value Chain Scaling Workshop, Kampala, 5–6 November 2019. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/107282>
10. Enting, I., Wang, B., Zhang, X. and Van Duinkerken, G. 2010. *The animal feed chain in China: opportunities to enhance quality and safety arrangements*. Ministry of Agriculture, Nature and Food Quality. <https://edepot.wur.nl/159855>
11. Ishumi, A.G.M. 1988. Vocational training as an educational and development strategy: Conceptual and practical issues. *International Journal of Educational Development* 8(3): 163–174.
12. Jagwe, J., Ouma, E.A., Brandes-van Dorresteyn, D., Kawuma, B. and Smith, J. 2015. *Pig business planning and financial management: Uganda smallholder pig value chain capacity development training manual*. ILRI Manual 12. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/56822>
13. Jjuuko, R., Tukundane, C. and Zeelen, J. 2019. Exploring agricultural vocational pedagogy in Uganda: students' experiences. *International Journal of Training Research* 17(3), 238–251.
14. Johanson, R.K. and Adams, A.V. 2004. *Skills Development in sub-Saharan Africa*. World Bank Publications.

15. Karubanga, G., Kibwika, P., Okry, F. and Sseguya, H. 2017. How farmer videos trigger social learning to enhance innovation among smallholder rice farmers in Uganda. *Cogent Food & Agriculture* 3 (1). <https://doi.org/10.1080/23311932.2017.1368105>
16. Lukuyu, B.A., Ouma, E.A., Dione, M.M., Paul, B.K., Dror, I. et al. 2020. Report of the Uganda Pig Value Chain II Priority Country project stakeholder implementation planning workshop, Kampala, 18–20 February 2020. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/107974>
17. Lukuyu, M., Kawuma, B. and Ouma, E. 2017. *The piggery business: Strengthening the financial and management capacities of pig producers in Uganda*. ILRI Research Brief 76. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/80378>
18. Mariojous, C., Le Gouvello, R. and Simard, F. 2019. Feed and Feeding in Certification Schemes of Sustainable Aquaculture. *Oceanography Challenges to Future Earth* 387–397.
19. Moock, J.L. 1984. Overseas Training and National Development Objectives in sub-Saharan Africa. *Comparative Education Review* 28(2): 221–240.
20. Moses, K.M. 2016. *Improving the quality and competence of technical vocational education and training output through vocational school cooperation with industry: A case study of Uganda*. <https://doi.org/10.1063/1.4965794>
21. Mulindwa, C., John, K., Kyaterekera, M., Mftumukizza, E. and John, K. 2016. *Training report: Strengthening farmers' capacities for profitable pig and pigmeat marketing in selected districts of Uganda*. <https://hdl.handle.net/10568/82749>
22. Ochieng J., O.E., Dione, M. and Pezo, D. 2016. *Governance structures and constraints along the Ugandan smallholder pig value chains*. <https://ageconsearch.umn.edu/record/246976/>
23. Okware, J.C. and Ngaka, W. 2017. Rationale and Challenges of Technical Vocational Education and Training in Uganda. In: *Technical Education and Vocational Training in Developing Nations*. IGI Global: 26–44.
24. Ouma, E., Dione, M., Lule, P.M., Pezo, D., Marshall, K. et al. 2015. *Smallholder pig value chain assessment in Uganda: results from producer focus group discussions and key informant interviews*.
25. Oya, C., Schaefer, F. and Skolidou, D. 2017. Effects of certification schemes for agricultural production on socio economic outcomes in low and middle income countries: a systematic review. *Campbell Systematic*.
26. Pindayi, B. 2017. Social Media Uses and Effects: The Case of WhatsApp in Africa. In: *Impacts of the Media on African Socio-Economic Development*. IGI Global: 34–51
27. Preece, J. 2017. *University Community Engagement and Lifelong Learning: The Porous University*. Springer.
28. Sartas, M., Schut, M., Proietti, C., Thiele, G. and Leeuwis, C. 2020. Scaling Readiness: Science and practice of an approach to enhance impact of research for development. *Agricultural Systems* 183: 102874.
29. Sartas, M., Schut, M., van Schagen, B., Velasco, C., Thiele, G. et al. 2020. *Scaling readiness concepts, practices, and implementation*. International Potato Center.
30. Tatwangire, A. 2013. Successes and failures of institutional innovations to improve access to services, input and output markets for smallholder pig production systems and value chains in Uganda. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/33578>

31. Tran, N., Bailey, C., Wilson, N. and Phillips, M. 2013. Governance of Global Value Chains in Response to Food Safety and Certification Standards: The Case of Shrimp from Vietnam. *World Development* 45: 325–336.
32. Trienekens, J. and Zuurbier, P. 2008. Quality and safety standards in the food industry, developments and challenges. *International Journal of Production Economics* 113(1): 107–122.
33. Ulvenblad, P., Barth, H., Ulvenblad, P.O., Ståhl, J. and Björklund, J.C. 2020. Overcoming barriers in agribusiness development: two education programs for entrepreneurs in the Swedish agricultural sector. *The Journal of Agricultural Education and Extension* 26(5): 443–464.

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