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Feed the Future Innovation Lab for Livestock Systems

The Rwanda pig value chains and ongoing initiatives

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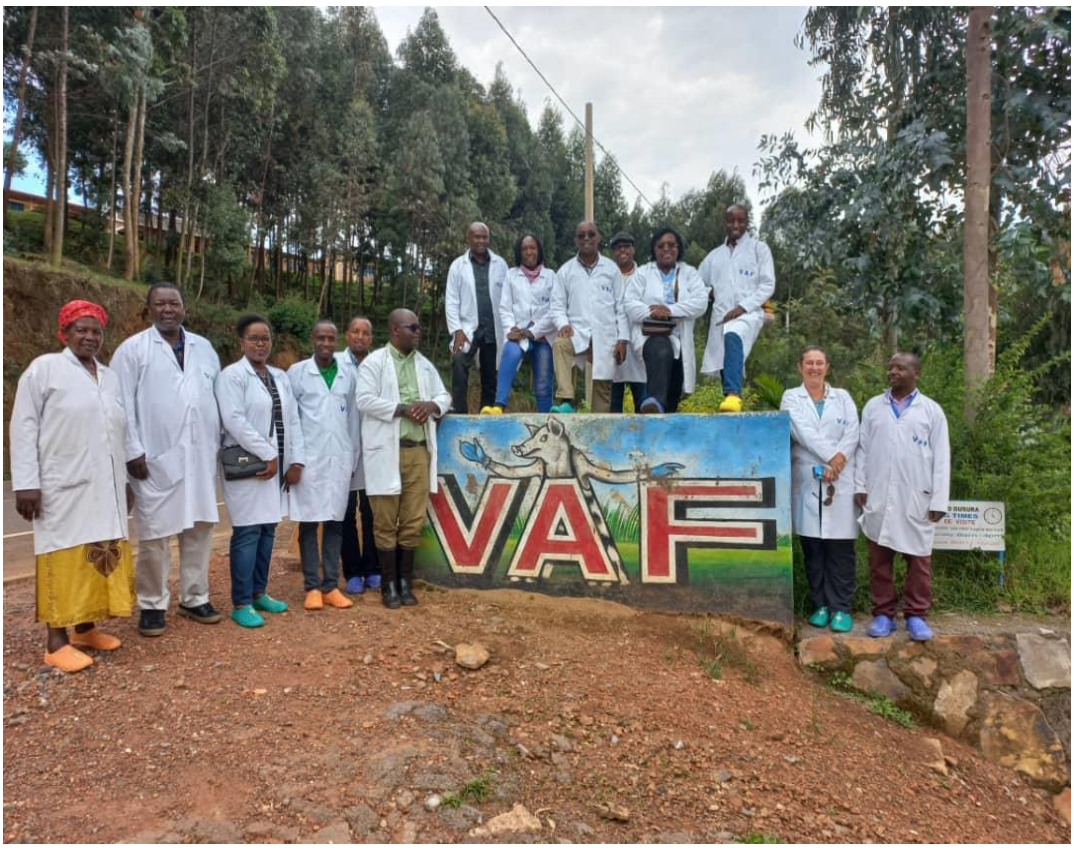

Project team visit to the Vision Agribusiness Farm in Rwanda (photo credit: Isaac Manyeki/ILRI).

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Background

The pig sector in Rwanda has grown considerably in the last 10 years, driven by increasing demand for both domestic and export pork. The Livestock Master Plan for Rwanda (2017/2018 to 2021/2022) identifies the pig value chain as one of the four key livestock value chains with the potential for a high productivity increase and the ability to contribute to national economic development objectives including food and nutrition security (Shapiro et al. 2017).

In Rwanda, pig farming is dominated by smallholders rearing one or two sows in their backyards and practicing low-input systems (Mbuza et al. 2016). The rural poor keep pigs to diversify risks and improve their livelihood. However, despite its high potential particularly for smallholders, the pig value chain faces critical production and market-related constraints. These challenges include reproduction, nutrition, husbandry practices, marketing and processing. Integrating interventions which improve herd health, feeding, genetics and market linkages can help overcome these constraints and leads to a more productive pig sector (Mbuza 2016).

The project titled 'Profiting from Pigs in Rwanda: Improving People's Lives and Livelihoods through More Productive Pig Farming' has been initiated with an overarching goal to improve the livelihoods of smallholder producers, sustainably, through increased productivity, incomes and strengthened market linkages in addition to strengthening the capacities of the Rwanda National Agricultural Research and Education Systems in pig husbandry including the production and delivery of quality pig genetics.

Approach

The project addresses the pig value chain constraints by focusing on integrated productivity-enhancing approaches and market linkage interventions that meet the needs and preferences of women and men pig keepers. It will be implemented in the Gakenke and Nyamagabe districts representing the Northern and Southern provinces, respectively, where most pig farmers are located. Gender components will be integrated into all research objectives. Local capacity development interventions and strategic partnership building are expected to facilitate investments from partners and take the pig farming innovations to a higher scale.

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Ongoing activities within the pig value chains

In September 2022, the project team visited the pig value chain actors and sites in Rwanda. This brief documents the structure and various activities within the nodes of the value chain. It also documents the key constraints and opportunities in the value chains as perceived by key stakeholders.

Inputs and services

Semen delivery through drones by Zipline

Pig semen is obtained from the Rwanda Agriculture Board (RAB) station in Muhanga as well as from private breeder farms such as the Muyumbu Pig Breeding Farm through the Kayonza semen depot and then distributed to farmers through registered veterinarians. The veterinarians place an order for semen to Zipline, an American company that operates delivery drones in Rwanda (and other parts of the world). Once the order is packed and dispatched, an SMS alert is sent from the drone to the receiver to prepare for collection. A package carries a maximum of three doses of semen. Zipline is also partnering with the National Child Development Agency (NCDA) and Rwanda Medical Supplies (RMS) to deliver deliver therapeutic foods and blood for emergency use in hospitals.

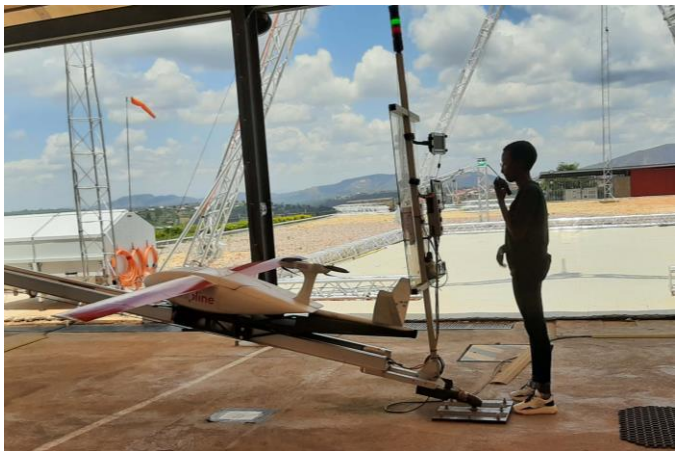

Figure 1: Drone usage at Zipline, Rwanda (photo credit: Isaac Manyeki/ILRI).

The Muhanga RAB centre of excellence – semen production

The Muhanga RAB station became a pig breeding centre in 2021. Its vision is to be a centre of excellence to produce adequate semen for the country. The initial breeding animals were obtained by the RAB station in April 2021 and comprised four breed types – Landrace, Large White, Pietran and Duroc – 4 males and 4 females of each breed. The centre started collecting semen in August 2021. After production, the semen is transferred to Zipline for dispatch to farmers. The farmers pay Rwandan Franc (RWF) 6,500 for the semen from the station. In addition to these services, the RAB centre of excellence further distributed boars to five breeders in Rwamagana, Bugesera, Rulindo, Gicumbi and Rusizi districts.

Demand for new breeds is increasing and the plan is to expand semen production at the centre of excellence by obtaining more breeds. Sixteen breeding pigs have been ordered from Belgium and other locations through the Enabel (Belgian Development Agency) project and will be delivered in three batches. The breeds include Camborough, Berkshire and Hampshire. The project has purchased automatic machines for sealing the semen straws.

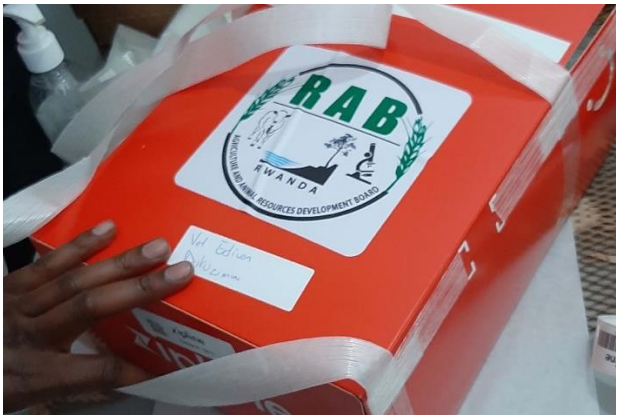

Figure 2: Pig semen package from the Rwanda Agriculture Board (RAB) station in Muhanga (photo credit: Isaac Manyeki/ILRI).

The University of Rwanda Busogo campus centre of excellence – semen production

The University of Rwanda Farm is mainly used for research, teaching and semen production for artificial insemination (AI). There are 2 main pig breeds at the farm –1 Landrace and 3 Pietran – obtained from the RAB Muhanga station. There are currently 2 boars – 4 to 5 years old. The AI expansion in Rwanda started at the university farm and in the Kisoro centre. The university signed a memorandum of understanding (MoU) with RAB in 2016 to conduct AI training in 6 districts. The MoU has since expired, and the centre is currently inactive. There are plans to attract private sector players to run the AI business. Some of the challenges faced by the university farm include poor quality feeds for the pigs from the suppliers.

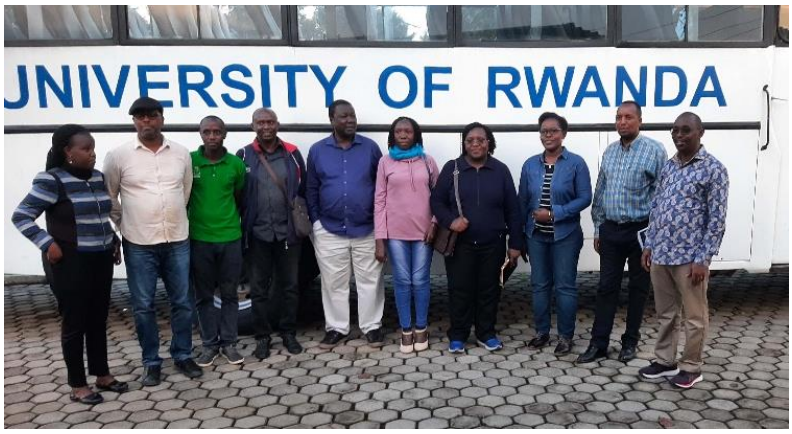

Figure 3: Part of the project research team that visited the University of Rwanda (photo credit: Isaac Manyeki/ ILRI).

Research and extension services

There are several institutions such as the University of Rwanda and the Rwanda Agriculture Board (RAB) involved in the piggery value chain research and extension through various projects including the Partnership for Resilient and Inclusive Small stock Market (PRISM-Enabel) project. PRISM-Enabel, which is funded by the Belgian Development Agency, is targeting commercial-oriented farmers, mainly on a medium and large scale. It works closely with the Rwanda Pig Farmers Association. The project has introduced Farmer Field Schools (FFS) in nine

districts across the country. The facilitators of the FFS are from the RAB staff who are trained by the Vétérinaires Sans Frontières (VSF). A curriculum has been developed for use by the facilitators. The project collaborates with Agriterra to organize farmers in high-potential areas for maize and soybean production and links them with feed millers where they can sell their produce. The project, in collaboration with the Ministry of Agriculture and Animal Resources (MINAGRI), has constructed a warehouse to ensure feed millers have sufficient feed ingredients.

The Orora Wihaze project has an activity that works with local partners and private sector actors in Rwanda to strengthen the animal-source foods market systems. Orora Wihaze means "to raise animals for self-sufficiency". The project works in eight districts and it has a goal to sustainably increase the availability of, access to, and consumption of animal-source foods through the development of a profitable market (Land O'Lakes Venture37 2021). The pig value chain is one of Orora Wihaze's main areas of focus. It collaborates closely with the VSF and has trained 11 veterinarians in Gakenke and 10 in Nyamagabe districts. They have also extended the training to build the capacities of private veterinarians. The veterinarians administer artificial insemination (AI) services to smallholder farmers who rear 1-2 sows. The key health challenges experienced are swine erysipelas, an infectious disease caused by the bacterium *Erysipelothrix rhusiopathiae*, that is seen mainly in growing pigs and characterized clinically by sudden death, fever, skin lesions and arthritis (Soto et al. 2021).

The project has established four semen storage centres (depots), 2 in Gakenke and 2 in the Nyamagabe districts. Each trained veterinarian works with farmers in a well-defined region. Semen is delivered through Zipline. The government pays for the delivery cost of semen by drones. There are plans by the private veterinarians to form a private vets cooperative. In Gakenke, there is a pig farmer cooperative.

Another project that works on the pig value chain in Rwanda is the PRISM-International Fund for Agricultural Development (IFAD) project, which is funded by IFAD and implemented by RAB in collaboration with Heifer International. It focuses on smallholder pig farmers from the lower social classes - Ubudehe categories 1 and 2. Ubudehe categories 3 and 4 are used for productive alliances – contract farming with the smallholders (PRISM 2019). Through Heifer International, the project is using a methodology of community-led development called Values-Based Holistic Community Development. Four hundred and eighty-five (485) pigs have been distributed to pig farmers in Southern and Northern provinces and beneficiaries are also given start-up feed packages and are trained in best practices. They are also trained in social and technical agribusiness management, and financial literacy. The project is also involved in the construction of pig slaughter slabs in the Nyamagabe, Musanze and Gicumbi districts.

Veterinary services

At the district level, the district veterinary offices offer veterinary services to farmers. VSF has worked in Rwanda since 2001 in 15 districts on aspects of animal health and production. It has collaborated with RAB to work with pig farmers on the black soldier flies as feed resources. It also supports the delivery of veterinary services in 12 districts in Rwanda. It trains private veterinarians – 60 have been trained and are offering last-mile AI service delivery to farmers through the partnership with Zipline and Orora Wihaze activities. VSF has also supported the setting up of four satellite semen storage depots. It is also involved in the Interfaculty Research Cooperation-One Health project that raises awareness among communities through social behavior change communication on porcine cysticercosis.

Feed millers

There are several feed companies in Rwanda. Examples include Gorilla Feeds, Huye Feeds, and Zamura Feeds, among others. Private farms such as Nutrifarm are involved in the production of edible insects and livestock feeds and also provide consultancy services in pig feeding.

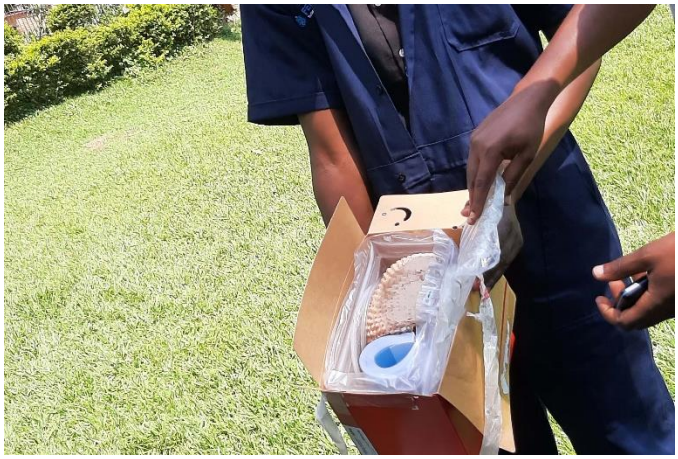

Figure 4: An officer opens a package delivered by Zipline drone services (photo credit: Isaac Manyeki/ILRI).

Pig production

Medium- and large-scale breeder farms

There are about five medium- and large-scale private breeder farms. The initial one was started in 1972 at the Kisaro Centre. Others include the Muyumbu Pig Breeding Farm in Rwamagana, and Vision Agribusiness Farm in the Gicumbi district, among others.

Figure 5: One of the pig farms visited in Rwanda (photo credit: Isaac Manyeki/ILRI).

Muyumbu Pig Breeding Farm

Muyumbu Pig Breeding Farm produces purebred and F1 pig breeds. It has Landrace and Pietran breeds from Belgium and Duroc from France. The cost of importation of a boar from Belgium was EUR 1,230 (FOB) excluding freight charges. The farm started producing semen in the year 2020. Semen is stored in Kayonza and delivered to farmers by Zipline through veterinarians. The farm also sells purebred F1 piglets/weaners at three months of age at a price of RWF 260,000.

The main challenge faced by Muyumbu Farm is that it cannot exchange boars or semen from other centres as most centres do not keep records. The farm also trains farmers through the Orora Wihaze program in the Eastern province. The farm makes its pig feeds using sunflower cake and soybean as protein sources and it has sent feed

samples to France for testing. Feed formulation includes crude protein for 21 piglets, 17 weaners and lactating sows, and 15 sows and growers. The farm has two technical staff – an AI technician and a veterinarian – and a laboratory for examining and testing semen. The farm weighs pigs regularly. From weaning to four months, pigs are weighed every two weeks. The criteria used to select breeding pigs include growth performance, number of teats and behavior of the mother. The farms also fatten pigs and sell them off to traders in the Democratic Republic of Congo (DRC). The farm is a price taker and unable to negotiate prices.

Vision Agribusiness Farm

Vision Agribusiness Farm imports pure breeds and crosses, multiplies and then sells them to farmers. It has two main breeds – Landrace and Pietran. The farm has four different sections/compartments of pig pens – weaning, growers, farrowing and mating rooms. There are plans to use biogas for warming the pig pens. It also produces AI which is sold at RWF 6,500 per dose. It sells castrated piglets targeted for fattening at a price of RWF 2,000 per kg and uncastrated piglets selected for breeding at RWF 4,500 per kg.

The farm also conducts farmer trainings and has plans to establish a training centre. It currently offers an industrial attachment for students from Rwanda Polytechnique, the University of Rwanda, and individual students from the DRC and Burundi. Training fees for farmers including lunch is RWF 8,000 per person per day. The complete training package for farmers lasts 30 days and covers several topics including biosecurity and husbandry practices, pig health, appropriate feeding, among others. A manual for farmers costs RWF 10,000 per copy. The fees for a 2-day business training for farm managers is RWF 200,000per person.

Smallholder pig farmers

Most of the pig production in Rwanda is in the hands of smallholder pig farmers, rearing 1-2 sows. Most of them practice intensive and semi-intensive production systems. Extensive systems involving the free roaming of pigs are prohibited in Rwanda.

Collection and bulking

Collection and bulking of pigs are mainly done by middlemen from within the farmer localities as well as cross-border traders, especially from the DRC. The pigs are transported using motorcycles for local sales or hired trucks for long-distance and cross-border sales.

Slaughter

Pig slaughter is mainly done in backyard slaughter slabs and small-scale abattoirs handling about 15–20 pigs per day. The carcasses are sold locally to restaurants and pork eateries. Some of the small-scale abattoirs transport the carcasses in refrigerated trucks to Kigali and cross-border traders. Rugari Meat Processing Ltd has a pig abattoir and slaughters pigs from their farms and commercial farmers with whom they have contracts.

Processing

The few formal pork processors in Rwanda include the German butchery and Rugari Meat Processing Ltd, which both selling processed pork products in the form of special pork cuts, sausages and salamis, among others. The processed products are sold in local supermarkets, high-end hotels and restaurants and exported to the DRC.

Wholesaling and retailing

The main wholesale and retail points for pork are local butcheries for fresh pork and restaurants, pork eateries (‘Akabenzi’) and resto-bars (‘Kabare’) that serve roasted or fried pork. The retail outlets for processed pork products are supermarkets and cross-border retail outlets.

Consumption

There is generally poor pork consumption within the country due to cultural biases and perceptions. Culturally, Rwandans are not meat consumers – only consuming about 8 kg/per capita. The piggery and poultry sectors are relatively new, and demand is growing. Rwanda's pig production is driven by the high demand from the DRC market though local consumption is also on the rise.

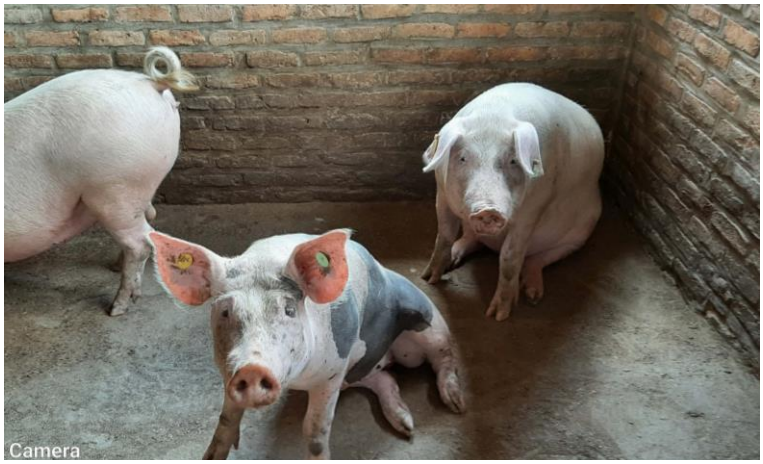

Figure 6: Pigs taking a rest in one of the pig farms visited in Rwanda (photo credit: Isaac Manyeki/ILRI).

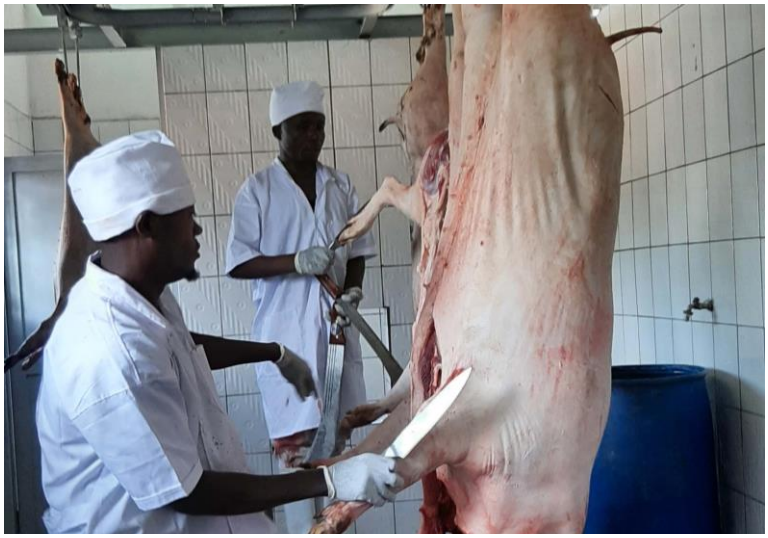

Figure 7: Pigs slaughtered for sale in Rwanda (photo credit: Isaac Manyeki/ILRI).

Constraints and opportunities in the pig production and marketing value chain nodes

A stakeholder workshop was held in September 2022 comprising 35 participants involved in the Rwanda pig value chains. During the workshop, an activity was performed to collect stakeholders' perceptions on constraints and opportunities in the various nodes of the pig value chains.

Animal health

Constraints

i. Swine erysipelas (rouge du pork) is one of the key health constraints as well as external and internal parasites.
ii. Limited use of laboratories for testing disease pathogens.
iii. The poor mindset of farmers regarding veterinary services: farmers call veterinary officers when disease has already advanced.
iv. Limited continuing professional development in the veterinary profession.
v. Lack of control for antimicrobial residues in meat by regulatory authorities e.g. the Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA).
vi. High cost of veterinary drugs as perceived by farmers.
vii. Poor training of veterinarians in laboratory analysis.
viii. Poor disposal of pig manure (waste).
ix. Poor transport means for pigs.

Opportunities

i. Supportive government policies.
ii. Availability of several partners in improving pig health: New Vision Veterinary Hospital, University of Rwanda, non-governmental organizations (NGOs), etc.
iii. One Health approach – for safe food production that promotes the health of pigs for safe human health.
iv. Rwanda Pig Farmers Association (RPFA) can be a channel for organizing farmers' training in pig health care.

Feeds and feeding

Constraints

i. Commercial feeds: Unavailability and inconsistency in the supply of ingredients and high production costs because most ingredients are imported into Rwanda.
ii. Competition for cereals used in feeds between humans and pigs.
iii. Low capacity of farmers – knowledge, information, skills (know-how) – on feeds and feeding.
iv. Limited access to guides/information on feeds and feeding in local language and easy to use formats.
v. No farms committed to large-scale forage production.
vi. Poor use of crop residues.
vii. Shortage of small-scale/portable feed processing equipment, agri/entrepreneurship.
viii. Lack of knowledge, affordable equipment and applications for feed formulation at the farm level.
ix. Poor feed conservation/preservation/storage (feed safety).
x. Limited finance to support investment in feeding.
xi. High cost of imported feed ingredients – partly due to taxation.
xii. Lack of good quality forage seeds/ food-feed crops e.g., soya bean.
xiii. Non-existence of small-scale feed producers.

Opportunities

i. Available/abundant agro-processing by-products.
ii. Support from the government to produce feeds.
iii. Technology/innovation for production and processing feeds is available. Only needs adaption.
iv. Government institutions with good infrastructure (human resources, labs and funds) to support feed and feeding projects.
v. Linkages with NGOs/development projects/private sector working with feeds and feeding of livestock.
vi. Existing Farmer Field Schools.
vii. Favorable climate for maize and soya bean production.
viii. Opportunity to support small-scale/young agripreneurs in commercial feed production.

Marketing of pigs

Constraints

i. Lack of price regulation in traded products.
ii. Low bargaining power of producers.
iii. Lack of preparedness by farmers when starting the business coupled with poor business skills.
iv. Lack of profitable market outlets.
v. Limited advisory services for piggery.
vi. Weak regulatory framework.
vii. Cultural limitations to pig production and consumption.

Opportunities

i. The existing willingness of farmers to rear pigs.
ii. Pig farming is profitable.
iii. Low start-up capital requirement.
iv. NGOs and government involvement is taking up the increasing opportunities for policies favouring the pig subsector.
v. Youth and the educated joining piggery as a business.
vi. Increasing demand for pork, which is still affordable compared to other types of meat.
vii. Proximity to the DRC market.

Genetics

Constraints

i. Limited utilization of laboratories.
ii. The mindset of farmers on the use of veterinary services.
iii. Limited continuing professional development in the veterinary profession.
iv. High cost of veterinary drugs.
v. Poor pig transportation.

Opportunities

i. Government policies.
ii. Partners in pig health.

Learnings and next steps

- The team appreciated several ongoing initiatives and investments in Rwanda aimed at transforming the piggery sector. The project will collaborate closely with institutions involved in piggery to add value to existing interventions.
- Several interventions will be implemented by the project, including an integrated pig husbandry package comprising herd health, feeds and appropriate pig feeding and improved pig genetics, for improving pig productivity and a farmer collective action business model to enhance value chain linkages and transparency in pig trade.

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