Local Assignment: Ugandan or East African volunteer to be paired with virtual supporting American volunteer.

Potential volunteers from Uganda or East Africa should email George.ntibarikure@crs.org and maria.nakayiza@crs.org to express interest.
American volunteers wishing to support virtually should email maria.figueroa@crs.org

**Farmer to Farmer**
**Volunteer Assignment Scope of Work**

| **Summary Information** | |
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| **Assignment Code** | **UG226** |
| Country | Uganda |
| Country Project | Livestock Country Project |
| Host Organization | Kabeihura Farmers Limited |
| Type of Volunteer Assistance | Technology Transfer (T) |
| Type of Value Chain Activity | Information and Input Support Services (S) |
| Assignment Title | Dairy Nutrition |
| Assignment preferred dates | Flexible |
| Objectives of the assignment | • Review current feeding regimes for the dairy enterprise and advise on improvements (Emphasis on Pasture/Forage production, feed supplementation and feed formulation)<br>• Develop a cost-effective dairy meal for milking cows, heifers and calves |
| Desired volunteer skill/expertise | Dairy Nutrition specialist/ Seasoned Dairy Farmer with expertise in feed formulation for dairy animals. |
| PERSUAP classification | Type III |

## A. BACKGROUND

CRS Farmer -to-Farmer program (F2F) is a USAID funded program that will be implemented for five years (2019- 2023) with a primary goal of reducing hunger, malnutrition, and poverty across six countries: Benin, East Timor, Ethiopia, Nepal, Rwanda and Uganda. The program aims at achieving this goal through advancing inclusive and sustainable agriculture led growth aimed at generating sustainable, broad-based economic growth in the agricultural sector. The program's secondary goal is to increase US public understanding of international development issues and programs and share the knowledge back in the US. To achieve its goals, F2F program provides volunteer technical assistance to farmers and farmer groups (associations and cooperatives), private agribusinesses, agriculture education institutions in developing countries like Uganda to address host identified technical needs in selected agricultural value chains. F2F volunteers are pooled from abroad range of US agricultural expertise, from private farmers with varied experience, University professors, bankers/certified accountants, animal health and nutrition specialists, soil scientists, agronomists who support local host organisations F2F program introduces innovation and develops local organisations capacity for more productive, profitable, sustainable and equitable agricultural systems while providing an opportunity for people- to-people interactions within the agricultural sector. In Uganda F2F program will focus its technical interventions in the livestock and agribusiness value chains

Kabeihura Farmers Limited is a privately-operated mixed farm seated on 250acres of land. The farm was started in 1975 and legally registered in 1995 by the Uganda Registration Services Bureau (URSB). The Farm engages in multiple enterprises including a) Dairy with a herd size of 120 animals (Average 50 are milking cows; the rest are heifers and calves). The Farm relies on Artificial insemination for the cows, b) Poultry: with currently 6000 laying birds primarily for egg production, c) Tea – which is planted on 70 acres of land, the farm produces green leaf for market purposes, d) Fish- the farm has set up a fish hatchery averagely producing 200,000 fingerings per month depending on market demand, equally producing an average of 2000 table fish per month. Two fish species are kept on the farm: Cat fish and Tilapia, e) the farm is engaged in milk processing: Selling excess chilled milk and on-farm processed Yoghurt. The farm has eucalyptus tree establishments on 10 acres of land, 4 acres of bananas (matooke) mainly serving as a food source for farm workers.

## B. ISSUE DESCRIPTION

Uganda has a favorable climate and fertile soils, which are two basic attributes that determine its agricultural potential. Three-quarters of the country receives 1,000mm to 1,500mm of rainfall annually[1]and enjoys two cropping seasons per year. This area, under normal conditions, has two rainy seasons, running respectively from March to May and August to November. The drier northeastern quarter of the country receives 600mm – 900mm of rainfall in a single season which runs approximately from April to October, and it is more prone to dry spells that occasionally disrupt crop production and the availability of food. Livestock production is particularly important in the drier areas (annual rainfall under 1,000 mm) of the corridor that run across the country from the northeast through parts of the central region and to the southwest. This is known as the cattle corridor[2] in which the dominant livestock production system is the pastoral system.

Livestock accounts for 53% of the agriculture capital stock and contributes 30% to agricultural GDP and contributing about 18% to overall agricultural GDP. The subsector provides opportunities for income generation, employment creation and improved food and nutrition security to households across the different production systems and along different value chains (such as meat, eggs, dairy, live animals and hides). It is projected that the demand for livestock products will increase substantially over the next 25 years, however the demand will supersede supply. About 5 million households in Uganda own livestock. The major livestock species in Uganda are; cattle (15 million), sheep (4million), goats (12.5million), pigs (3.6 million), and poultry (42 million). According to the ASSP 2016/2020, the sector is prioritizing the following livestock products over the medium term: Dairy/milk, Beef, Pork, Mutton, Goat, Poultry, Honey, Silk and Hides and Skins. Beef, dairy cattle, and poultry have been identified as strategic agricultural commodities for the country that are to receive increased investment for accelerated production. The sector targets to produce 3.35 billion liters of milk annually and its products worth approximately USD 49.673 million by 2020. Thirty three percent (33%) of the marketed milk in Uganda is processed whereas sixty seven percent (67%) is marketed raw, providing opportunities for further investment in dairy processing.

From an economic point of view, cattle are the most important livestock,[3] with the indigenous breeds accounting for over 95% of the national herd. Southern and Western Uganda are the major producing regions, with 80% of the national cattle herd and an average number of cattle of 2.11 per household in 1999[4]. The bulk of cattle (as is the case for small ruminants), essentially the indigenous breeds, are kept under traditional herding production systems. Most cattle (about 91%) are held by pastoral communal

[1] Rainfall distribution has generally been categorized as: High: Over 1 750 mm per annum - 4% of the land area; Moderate: 1 000 - 1 750 mm per annum 70% of the land area; Low: Under 1 000 mm per annum 26% of the land area.

[2] The cattle corridor covers (parts of) the districts of Kotido, Moroto, Mbarara, Ntungamo, Masaka, Ntungamo, Masaka and Rakai.

[3] The national livestock population was estimated to comprise 6 million cattle, 6.6 million goats, 1.1 million sheep, and 1.6 million pigs in 2001 (http://www.ugandainvest.com/livestock.pdf).

[4] Compared to Northern Uganda at 0.67 and the national average of 1.37. See, for example, Country pasture/forage resources profile-Uganda (Mwebaze, 1999).

grazers, nomadic pastoralists and small holder mixed farmers[5], who together are the major suppliers of slaughtered cattle. The rest of the cattle are kept on beef ranches and farms**.**

Broadly, there are two livestock production systems, namely the traditional system and the improved systems[6]. The traditional system, characterized by minimal inputs and correspondingly small outputs, depends on natural grazing and local breeds. Improved systems, on the other hand, involve some investment such as fencing, pasture and grassland improvement, provision of water and breed upgrading. Livestock production systems and management practices are dictated by the degree of dependence of the household on livestock products for income, cultural values, food supply, and crop agriculture practiced in association with livestock under traditional and non-traditional practices.

Forage resources in Uganda range from the traditional system, where extensive natural grasslands support semi-nomadic pastoralist and unfenced communal grazing, to the improved system, where the farm perimeter is fenced with paddocks of natural or planted grasses. This fencing helps to control tick-borne diseases while also enabling better pasture management. Commercial ranching is based on extensive grazing and is so far the cheapest system of beef production. There is also a growing interest in intensive and semi-intensive beef and dairy cattle production, in which improved breeds (i.e. exotic and cross breeds) are mostly kept under intensive management on small and medium sized farms under zero grazing. Additionally, it is now common to combine crop and livestock production whereby the two enterprises complement each other. In fact, mixed farming is the most common smallholder dairy system in the southwest, central and southeastern regions.

Livestock production has continued to grow at a rate of over 4% per annum, in response to increasing demand for milk and meat in the local market[7]. A higher rate of growth is envisaged as the government continues to pursue its policies of modernizing and commercializing agriculture. The targeting of high-potential areas as a basis for resource allocation, by both government and private investors, has led to the rapid increase in output and the integration of the livestock sub-sector into the cash economy, especially for dairy and beef related enterprises.

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[5] This mixture –comprising of integration of cattle and crop farming –has been referred to as “agro-pastoralism" (http://www.nationsencyclopedia.com/economies/Africa/Uganda-AGRICULTURE.html.).

[6] Within these general types the five grazing methods have been documented namely i) Communal /pastoral system ii) Tethering iii) Enclosed ranching iv) Fenced dairy farms and v) Zero grazing See, for example, Country pasture/forage resources profile-Uganda (Mwebaze, 1999).

[7] The demand for milk in Uganda comes from households, schools, hospitals, catering institutions, food and dairy processing plants. By 2001 the dairy sector in Uganda was reported to contribute about 20% to the food processing industry, which itself contributed about 4.3% to the national GDP (http://www.ugandainvest.com/livestock.pdf).

Milk production countrywide has steadily increased with the western Ugandan districts accounting for the biggest proportion[8]. Likewise, the per capita consumption of milk increased over this period from as low as 30 liters per year to a level of 40 liters per year as of 2001[9]. This consumption level was higher in urban areas (estimated at 48 liters/year) as compared to rural areas (estimated at 22 liters/year). The expansion of market opportunities for dairy products has seen an increasing trend towards commercial production among small holder mixed and dairy farmers. This has offered the opportunity for private entrepreneurs such as Kebeihura limited to venture into the dairy sector.

Despite the noticeable progress in the development of the livestock sector and dairy sub sector, the subsector is still faced with several limitations. These setbacks include, among others: increasing degradation of grazing areas due to poor grazing practices (like over-grazing); inadequate production of improved pastures and short supply of good livestock feeds; inadequate knowledge on improved livestock/dairy herd management practices to prevent high morbidity and mortality levels within the individual herd; inadequate feeding due to shortage of quality and quantity of forage and fodder particularly during the dry season; lack of access to high quality seed and vegetative planting material and the high cost of production in the intensive systems resulting in low returns. These limitations are exacerbated by the widespread low literacy levels among most livestock farmers which hinder the adoption of improved technology. The sector is further constrained by the poor market outlets for milk (due to a poor rural road network and near absence of rural electrification).

Kabeihura Farmers Limited faces challenges of poor /inadequate dairy feed management caused by several such as:

- Poorly formulated dairy meal, this has been designed by farm owners who are not professional dairy nutritionists which may compromise the quality of feed.
- The current feed formulation may not be as cost effective in terms of raw materials used which increases the cost of production
- Equally the dairy meal is uniform for all herd categories which may deprive or provide excess of required nutrients across the different animal types.
- Lack of training for farm workers on proper fodder preparation and the types of pastures to grow to cater for animals' nutrition needs

Due to above factors, Kabeihura limited experiences low dairy productivity (the dairy herd is not producing at its maximum potential) and high production costs hence reduced profit margins. It is against this background, that Kabeihura limited is requesting for a volunteer consultant with extensive experience in dairy cow nutrition. In the cattle herd aspect, the consultant's emphasis during visit shall be on capacity building for pasture management and hay- and silage making technology for feed preservation using

[8] The leading districts in dairy production are Mbarara, Moroto, Bushenyi, Kotido, Masaka, Mbale, Kabarole, Mukono, Ntungamo, Kamuli, in that order. A recent study (2001) by Land O'Lakes revealed that the western region of Uganda continues to remain a low cost-producing region of the country reflected in relatively low prices of the final products. (http://www.ugandainvest.com/livestock.pdf).

[9] This, however, was still below the World Health Organization recommended level of 200 liters/person/year (http://www.ugandainvest.com/livestock.pdf).

tropical forages and grassland species. Development of these aspects at Kabeihura Farm limited plus demonstration of best practices of on-farm hay and silage making are envisaged to be key contributions to effort of increasing and stabilizing the farm's dairy production.

## C. OBJECTIVES OF THE ASSIGNMENT

The main objective of the assignment is to empower Kabeihura Farmers limited in dairy nutrition to meet production efficiency of dairy cows.

**Specific objectives**:

- Review current formulations and design low cost but effective feed formulations
- Design feed meal for specific her categories to meet specific needs
- Train farm workers on proper fodder preparation and the types of pastures to grow to cater for animals' nutrition needs
- To review field pasture management and make recommendations for improvement
- To review establishment of pastures and types for hay/silage making and make recommendations for improvement
- To train farm workers at Kabeihura and staff in hay preparation and preservation
- To develop capacity for the farm to effectively utilize available crop residues in both fresh and preserved forms

## D. HOST CONTRIBUTION

The host has committed to allocate on key staff to work closely with the volunteer during the trainings and practical trials. The farm directors will be available to work closely with the volunteer for the entire duration of the assignment.

## E. ANTICIPATED RESULTS FROM THE ASSIGNMENT DELIVERABLES

The anticipated assignment deliverables will include**:**

- Trainings conducted and people trained
- Feed formulation guidelines/manual developed
- Debriefing with USAID and in country group presentations after assignment
- Field trip report and expense report
- Outreach activity, press release or a media event back in US

## F. SCHEDULE OF VOLUNTEER ACTIVITIES IN COUNTRY (DRAFT)

| Day | Activity |
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| Day 1 | Travel from home to US international airport |
| Day 2 | Arrival at Uganda Entebbe Airport, the volunteer will be picked by Fairway hotel shuttle to Kampala and check in at Hotel. |
| Day 3 | At 9.00 am, the volunteer is greeted at the hotel by CRS staff and thereafter go to CRS office for introductions and briefings including host brief, logistics and expectations and anticipated outcomes. Any materials for printing will be prepared at CRS offices.<br>In the afternoon: Travel to Bushenyi to commence the assignment |
| Day 4 | In the morning, CRS introduces the volunteer to the Kabeihura Farm management team. Together with CRS and the management, the volunteer will review and finalise the work-plan. The action plan should include group presentations to be done after the assignment.<br><br>Familiarise with Farm operations particularly the dairy section – understand current practices and challenges to inform interventions in feed formulation and fodder preservation |
| Day 5-10 | Review the current feeding regimens for the dairy animals (milking cows, heifers and calves). The type of feed supplements (feed ration), review the current silage -process and quality of final product. Familiarisation with the current pastures grown on the farm. This assessment will help inform the type of recommendations/ practical sessions to help improve the nutrition of the dairy animals.<br><br>Design feed formulation program and feeding regime. Develop a training program for demonstration in formulation and feeding techniques. Carry out a pilot test as applicable. |
| Day 11-12 | Undertake a practical training session for farm management staff. Develop a comprehensive code of good practice for feed formulation and feeding regimes for different herd categories. |
| Day 13- 14 | Develop hay program including requirements for making good hay, preservation and construction of hay barn suitable to tropical conditions. Discuss various models of making hay barn under local conditions. Discussions should also include improvements to the silage making process as applicable. |
| Day 15 | Wrap up trainings and emphasize key concepts of feed formulation and feeding regime assignment. The farm directors should evaluate the training and together with the volunteer discuss final report recommendations. |
| Day 16 | Volunteer travels back to Kampala |
| Day 17 | Debriefing at CRS office with USAID Mission and CRS staff.<br>Volunteer will finalize his/her reporting at CRS office and fill out all necessary M&E forms as well finalize advances and expenditures with finance. |

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| Day 18 | Depart for USA |
| TBD | Outreach event in the US |
| **Note**: ***This is a draft schedule that will be finalized based on volunteer actual dates of availability, Sundays are typical rest days and working on Saturday is, per the host's request*** | |

## G. ACCOMMODATION AND OTHER IN-COUNTRY LOGISTICS

The volunteer will stay at Fairway hotel, www.fairwayhotel.co.ug. For the first one or two days on arrival. While in Bushenyi, the volunteer will reside at Ankole Resort Hotel for the entire duration of the assignment. The volunteer will be provided with a modem from the CRS field office for internet access and a mobile phone to facilitate in country communications.

CRS will pay for hotel accommodation and provide volunteer with per diems to cater for meals and other incidentals. The volunteer may get an advance which has to be cleared before departing Uganda. For more information, please refer to country information that will be provided

## H. RECOMMENDED ASSIGNMENT PREPARATIONS

### i) Before departing on assignment

- CRS-F2F designs assignments with the assumption of some pre-departure preparation by the volunteer. Actual preparation time will vary based on the experience of the volunteer, as well as informational or training resources the volunteer has readily available. CRS relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Uganda
- Some of the preparation may include: understanding of the livestock subsector in Uganda – especially the different livestock production/management systems
- CRS strongly recommends that the volunteer become familiar with CRS programs in Uganda, especially the livestock country project description and other information in the briefing pack before arrival to Uganda

### ii) In-country activities/tasks

- Assess current production levels, management procedures and feeding regimes practiced at the farm and examine available raw material ingredients for dairy meal
- Together with management, undertake practical demonstrations and training on feed formulation using different options and computer-generated feed ration programs.
- Train in calculation and feeding regimes of the different diary categories (lactating cows, heifers and claves)
- The volunteer should prepare materials for hand out which can be printed at CRS office in Kampala before commencement of the assignment. Flip charts, markers, masking tapes can be obtained at CRS offices.

## I. KEY CONTACTS

<table>
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