

**Farmer-to-Farmer East Africa**

**Volunteer Assignment Scope of Work**

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| **Summary Information** | |
| Assignment code | ET22 |
| Country | Ethiopia |
| Country Project | Horticultural Crops Production and Sector Support |
| Host Organization | Adigrat University Agricultural College of Agricultural Research and Extension Division |
| Host partner (2nd host) | Ethiopian Catholic Church-Social and Development Coordination Office of Adigrat Diocese (ECC-SDCOAD) |
| Assignment Title | Preparation and Processing of cactus fruits and nopal/vegetable |
| Assignment Preferred Dates | June – Sept |
| Assignment objectives | * Disseminate methods for cactus fruit preparation and provide nutritional information for hosts. * Provide information for processing and preservation of cactus fruit, leaf etc. * Introduce simple fruit picking technique |
| Desired Volunteer Skill/Expertise | Horticulturist with focused knowledge and experience on cactus production, nutrition and food safety |

1. **BACKGROUND**

Ethiopia faces challenges of increasing population pressure and low levels of agricultural productivity which aggravate the country’s food insecurity and contribute to poor nutrition. Increasing production and diversification of fruits and vegetables must be coupled with behavior change at the household level to increase productivity levels of smallholder farmers and subsequently increase their incomes, as well as improve household nutrition status. Use of low levels of modern production technologies and practices contribute to yields that are lower than would otherwise be expected. Despite the high ecological and socioeconomic potentials of Ethiopia, horticultural production in the country is relatively small scale and underdeveloped. Presently however, the horticulture sector is a priority for the Agricultural Growth Program (AGP) of the Ethiopian government in the Growth and Transformation Plan (GTP) of the country[[1]](#footnote-1).

Among the several Ethiopian horticultural crops, cactus is one of the least considered crops of the country. However, the prickly-pear cactus is one of the very few plants that continue to grow in the on-going droughts areas of Tigray region as well as in pocket areas of other regions. Drought in Tigray region is one of the most factors in continually changing the landscape. It was historical that the droughts and subsequent poverty in Tigray-Ethiopia took millions of lives. On the other hand, it was also historical that cactus-based production system and its local food making were saving people’s life in Tigray. Some authors’ articulate cactus based production as excellent example of community-driven, science-led, sustainable solutions for reducing the impact of food insecurity in Tigray[[2]](#footnote-2). The cactus is initially grown for fencing and control of soil erosion, but later-on its fruit and leaves were used for human consumption/food as well as animal feed/forage. Cactus is serving as a bridging food during draught seasons and food insecurity situations. Through prompting the use of cactus (*beles[[3]](#footnote-3)*), the crop would help in improving food security and income generation[[4]](#footnote-4). It served as a strategic wild crop for disaster risk reduction and climate change mitigation.

Generally, cactuses (*Opuntias*) are now part of the natural landscape and the agricultural systems of many regions of the world[[5]](#footnote-5). Typically around the world, there are three main production/farming systems: wild cactus communities; family orchards; and intensive commercial plantations. Cactus plant has adapted perfectly to arid zones characterized by droughty conditions, erratic rainfall and poor soils subject to erosion. It became an endless source of products and functions, initially as a wild plant and, later, as a crop for both subsistence and market-oriented agriculture, contributing to the food security of global populations in agriculturally marginalized areas (5).

The cactus (*beles*) belt areas of Tigray region has long dry season where the rainfall is ever scarce due to climate change. The landscape is a patchwork of greys and browns. For many months, the prickly pear cactus plants (*Opuntia ficus indica)* is one of the most spots of green far and wide due to its special nature to store-up water during the rains for the long dry season ahead of time (4). Among the three cactus production/farming systems, that of Tigray region can be categorized to the ‘wild cactus communities’ production/farming system. Production is mostly wild while serving significant number of people in Tigray.

The Tigray region is one of the four Agricultural Growth Program (AGP) and Feed-the-Future (FTF) regions of the country and horticulture sector is one of the priority areas of the AGP. Promoting horticultural production, and particularly cactus (*beles*) crop production in this case, can furthers the AGP, the FtF and the Growth and Transformation Plan (GTP) of Ethiopia.

1. **ISSUE DESCRIPTION**

Local knowledge of Cactus fruit nutritional benefits, cactus leaf and fruit usage, advanced production techniques and variation of recipes is limited. Production constraints of cactus (*beles*) crop in Tigray region are diverse. The problems may be aggravated for its being wild. No or poor crop production and management practices are properly pursued. Yield ranges in Tigray/Ethiopia are low and mostly unknown[[6]](#footnote-6). Deterioration of the local/primitive varieties gradually losing its original nature of tolerance levels to climate change and pest infestation are severely observed. There are no or low efforts and practices in soil fertility and management system. The plant recovery system after cutting and/or harvesting and sometimes after unwise and wild destructions is strongly dependent on rainfall and intensity of usage.

Likewise to the other crops, there are many production factors that need to be considered for cactus production/farming. Yet, most crop production improving factors are loosely considered or overlooked except recent initiation by Mekele and Adigrat Universities and certain projects.



Figure 1. Wild community farming system of cactus crop in Tigray region

There exists a knowledge gap in proper management practices and care, harvesting systems, food preparation (Fruit/Juices/etc.), and preservation methods. Moreover, there is no or slight nutritional attention with low levels of farmers’ knowledge on nutrition for both human diet and animal feed. The way of feeding to animals (cattle, goat, sheep, etc) pursues wild fashion and has no normative consumption/feeding rate.

In addition, cactus belt farming in Tigray is characterized by economically low viable family farms in terms of sustainably managing their natural resources, striving for food security and adapting to climate change. There is low rural community empowerment. Communities’ self-reliance are at low capacity to look after the disadvantaged and vulnerable households despite the potential of cactus (*beles*) value chain to the extent of establishing a *beles*/cactus processing industry for local and/or regional market, and formulating ‘*beles* dishes’ as a means of enhancing food security for the target communities (2).

The Agricultural College of the Adigrat University pursues three interrelated pillars: training; on-farm research; and farming community service. Under the training and community service pillars, the University has requested volunteer assistance to introduce modern cactus processing and preservation technologies and nutritional recipes for cactus (*beles*) value chain in Tigray. The University identified lack of skills and knowledge on modern cactus production. Among the other aforementioned challenges, these are significantly contributed to the low yields and crop deterioration problem of the region. The volunteer specialist will train the targeted staff, intern students and smallholder farmers.

1. **OBJECTIVES OF THE ASSIGNMENT**

The objective of this particular volunteer assignment is to train and/or technically assist the targeted beneficiaries (52% female and 48% male) to disseminate methods for cactus fruit preparation and provide nutritional information for hosts, provide information for processing outputs from cactus growth, introduce proper production, management, and harvest of cactus fruits. The volunteer will assess current practices and will recommend improved practices through a series of trainings, and if possible through field (on-farm/ in kitchen) practical demonstrations.

The volunteer will provide technical assistance to staffs (three lecturers/junior researchers, Development Agents /DAs/ from the district agricultural office of the government and Community Development Workers /CDWs/ of the ECC-SDCOAD); students of the university and smallholder cactus farmers.

The training for University staffs and students will take place in the University compound while the training for other staffs will be held in the office compound of neighbouring districts of agricultural offices. Smallholder farmers can be trained in nearby Farmer Training Centres (FTCs). Smallholder farmers will benefit from both the training and direct technical assistances at on-farm levels. The volunteer will also conduct research mentoring and share her/his experience to the junior researchers at the University.

Anticipated training topics include but are not limited to the following;

* Value addition and processing of cactus fruits and nopal
* Food preparation from fruit and nopal
* Preservation of products and food safety
* Utilization of raw and unprocessed products
* Simple harvesting techniques/systems,
* Nutritional Information of Cactus fruits and recipes for various consumption methods

**Host contribution** – The agricultural college and research division of the Adigrat University will assign an associate to the volunteer to accompany and advise her/him on the local situations. And also facilitate the training, technical assistances, and on-farm visits and training for its staffs and DAs. In consultation and coordination with CRS, the University will arrange transportation for on-farm field trips and FTCs to serve the selected smallholder farmers. It will also organizes the volunteer’s hotel arrangements (lodging and meals), and ensure all required facilities are appropriate. CRS will cover logistic costs (lodging, fuel, etc) costs against receipts and provide per diem advances for meals and lodging.

1. **ANTICIPATED RESULTS FROM THE ASSIGNMENT**

It is anticipated that this volunteer assignment improve and equip the TOTs (staffs and students) and smallholder farmers on modern cactus consumption and processing techniques and practices that will ultimately lead to improve the cactus market system and improve utilization and nutrition. Anticipated results from the assignment include:

* + A total of 70 direct beneficiaries will be benefited from this training and technical assistance: staffs, students, smallholder farmers, DA’s and CDW’s.
  + If time permits, TOT guidelines or manual will be developed and submitted
  + Field trip reports with recommendations to host organization and CRS is submitted and cash advance is reconciled
  + Final debriefing meeting with host organization, partners, CRS/USAID and relevant stakeholders is conducted
  + Outreach events conducted upon return to the US.

1. **SCHEDULE OF VOLUNTEER ACTIVITIES IN ETHIOPIA**

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| **Day** | **Activity** |
| Day 1 | Arrival in Addis. The volunteer will be met at Bole Airport by CRS’s client hotel Churchill ([churchillhotel@ethionet.et](mailto:churchillhotel@ethionet.et); phone # 0111111212). The volunteer will locate the Churchill hotel kiosk and receive their pre-arranged transport. |
| Day 2 | * Briefing meeting at CRS office on security, general orientation and logistics and itinerary of the entire trip. And discuss anticipated outcomes and work plan. |
| Day 3 | * Air flight to Mekele city (780 km) and car travel to Adigart town (120 km from Mekele) and meet with Adigrat University and introduction with ECC-SDCOA * Briefing on the main objectives of the assignment & work planning session and adjust the agenda as appropriate with the staffs of the host and CRS F2F. |
| Day 4 | Meeting with key stakeholders and key personnel as appropriate. Confirm the identified constraints with the targeted beneficiaries including smallholder cactus farmers. |
| Day 5-7 | * Conduct training and presentation to the students, staff and farmers * Assess and refine the quality of trainings through feedback and observations. |
| **Days 8** | **Rest day** |
| Day 9-14 | Systematically and strategically continue the activities of Days 5-7 |
| **Day 15** | **Rest day** |
| Day 16-17 | Continue the activities of Days 9-14 |
| Day 18 | * Wrap-up session: participants evaluate the overall technical assistance and trainings, and together with the volunteer discuss on recommendations. * Group presentation (PPT) with the presence of CRS F2F. |
| Day 19 | Volunteer drives back to Mekele and flight back to Addis accompanied by CRS staff |
| Day 20 | * Volunteer finalizes his/her reporting and submits training M&E forms to CRS F2F staff. Debriefing at CRS office with USAID Mission and CRS staff. * Volunteer liquidates cash advances and expenditures with finance (if received). * Depart for US (evening hours) |
| TBD | Outreach event upon return to the US, could include: presentation with a local group/organization, press release, media event and/or speaking tour. |

1. **DESIRABLE VOLUNTEERS SKILLS**

The volunteer will have the following qualifications and competencies:

* Qualifications in relevant field of sciences: food/horticulture science preferably in cactus, crop science, agronomy, with demonstrated knowledge and experience on cactus production and nutrition,
* Hands on agricultural experience and knowledge
* Affinity with capacity strengthening and facilitation of trainings
* Sensitivity and adoption towards cultural differences and gender mainstreaming focusing women empowerment,
* Good communication, inter-personal and writing skills,

1. **ACCOMMODATION AND OTHER IN-COUNTRY LOGISTICS**

* Before flying/travelling to the assignment site, the volunteer will stay in Addis Ababa at one of the CRS’s client hotels that will be booked and confirmed before the arrival date.
* In Addis Ababa, the hotel usually has rooms that include services such as airport pickup and drop-off, breakfast, wireless internet, etc.
* The hotel or CRS will arrange a vehicle for short travel from the hotel to CRS and vice versa while in Addis Ababa.
* All required materials will be prepared ahead of time and will be provided to the volunteer. CRS Ethiopia will provide the volunteer with a laptop computer (if s/he needs), local internet dongle (modem/EVDO) and mobile phone with charged local SIM-card. Any other required logistics and facilities can also be requested by the volunteer during her/his stay in Addis Ababa.
* CRS will arrange local flight and transport vehicle and as well as will accompany the volunteer to the assignment site.
* During her/his entire assignment duration, the volunteer will be booked in a hotel at Adigrat town.
* CRS Ethiopia will arrange hotel accommodation and cover the lodging bills against receipts.
* CRS HQ will provide the volunteer with a per-diem advance to cater meals and incidences.
* CRS Ethiopia will also reimburse the volunteer with laundry costs against receipts.
* Before departing to US, the volunteer will also liquidate advances (if any) at CRS Ethiopia.
* For more information, please refer to country information that will be provided.

1. **RECOMMENDED ASSIGNMENT PREPARATIONS**

* Although CRS F2F has developed such hinting SOW, the volunteer can fine-tune through her/his professional qualifications to successfully carry out this assignment.
* Although the assignment site is in dry highland areas and malaria may not be prevalence, having precautions in taking pills or vaccination for malaria and (maybe also for cholera) upon recommendations by her/his doctors/health professionals in US may be advisable.
* Prior to travel, the volunteer is advised to prepare necessary training and demonstration aids and written handouts. Softcopies of the handouts and any other paper materials can be printed for immediate use at the CRS office in Addis Ababa on request by the volunteer.
* If the volunteer requires use of simple training aids like flip charts, markers or tape s/he should make the request and collect from the CRS office in Addis Ababa prior to travel to the assignment place.
* If required, translation of handouts to the local language can be done in the locality of the assignment, if required.
* Depending on the meeting places and availability of electric power and LCD projector, the volunteer may use a laptop and projector for power point presentations.

1. **KEY CONTACTS**

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1. *World Bank (2010): Ethiopian Agricultural Growth Project (AGP) Project Information Document (PID)-Appraisal Stage, Report No.: Ab5416* [↑](#footnote-ref-1)
2. ## *David A. B. Unknown. The Cactus-based Production and Processing Initiative in Ethiopia. The Praxis Ethiopia Foundation.* [*http://www.praxisethiopia.org/donate-money/donate\_1.htm*](http://www.praxisethiopia.org/donate-money/donate_1.htm)

   [↑](#footnote-ref-2)
3. *Local name of cactus in Tigray/Ethiopia* [↑](#footnote-ref-3)
4. *HELVETAS Swiss Inter-cooperation. 2015. Cactus for food security and climate change adaption in Ethiopia. The Beles SUNRise Project in Ethiopia’s Northern Region Tigray;* [*http://www.helvetas.org/projects.ethiopia/*](http://www.helvetas.org/projects.ethiopia/) [↑](#footnote-ref-4)
5. *Candelario M. J., Salvador P.G., Enrique A., Stephen G. R., and Manuel D. S. (edrs). 2001. Cactus (Opuntia spp.) as Forage. FAO Plant Production and Protection Paper-169. Food and Agriculture Organization of the United Nations, Rome.* [↑](#footnote-ref-5)
6. *Candelario MJ et.al (2001) reported wider forage yield range of 25-125 t/ha (75-80% aboveground biomass) for Northern Mexico depending upon the species, plant vigor, climate, soil fertility and management system.* [↑](#footnote-ref-6)