



VOLUNTEER REPORT FORMAT

To be submitted to CRS at the end of volunteer assignment and shared with the Host

1.1 Assignment information

- a) Volunteer Name: David John Zaber
- b) Host Organization: Catholic Relief Services
- c) Assignment: Smallholders Training on GAP, Proper Use of Pesticides and Fertilizer, Integrated Pest Management
- d) Dates of Assignment: September 4, 2014 – September 29, 2014.
- e) Number of days worked 20 Days

1.2.1 Objective 1, 2 and 3 in your SOW – **Increased quality and quantity of tomato and other vegetable crops cultivated by Nguvukazi Group – Tanangozi, Iringa, Tanzania. Proper use of pesticides and fertilizers, Integrated Pest Management.**

- a) **Progress with the objectives:** We made significant progress towards the stated objectives in the Scope of Work. Each week we met with the full group (M,W,F) and visited individual farms (T,Th). Attendance was consistent throughout the project although female attendance was low throughout. A total of 12 individual farms, or shambas, were visited during the project. These farms encompassed the full range of soil types, elevations, water sources (groundwater and/or surface water), and crop types available to Tanangozi producers. Individual farm visits were always attended by the farmer/owner and often were attended by others in the group. The full range of crops grown by Tanangozi producers were observed and discussed during the project.

Initial meetings (2) were used to gather information from producers. This information consisted of the type of crop each producer was growing at the current time as well as the crops each producer was planning to grow in the future. Results of this inquiry revealed a diversity of crops grown by producers in Tanangozi with the majority growing Sweet and Hot Peppers (Hoho and Pilipili), Corn (maize), Tomato (Nyanya), Onions (Vitungu), Carrots (Karoti), Beans (Maharage), Cabbage (Kibichi), Pumpkin or Squash, and Potato (Viazi). All producers indicated a desire to grow a variety of crops and to learn techniques for improving yields. I was able to visit farms with examples of each of the aforementioned crops at various stages of growth.

In addition, I queried producers regarding the primary challenges they faced with a ranking of their importance. Integrated pest management (IPM) issues received the highest ranking from the majority of producers with an emphasis on the proper use of pesticides and fertilizers for human health and safety as well as economic factors. These issues were followed in importance by the need to protect and restore soils as well as how to respond to market forces and other economic factors facing producers.

I. PESTICIDES.

- a. Producers in Tanangozi use a variety of pesticides for control of insect pests (Insecticides), plant weeds (herbicides), and fungi (fungicides). Many of the chemicals used by Tanangozi producers are toxic to humans and non-target organisms including beneficial insects, fish, and birds. At the same time, current use patterns result in high risks of pests developing resistance to important chemical controls. For example,



insecticides and fungicides are routinely applied in mixture of two or more individual chemicals. This method is considered the worst in terms of developing resistance in target pests. In addition, several insecticides used by producers are imported from countries where they are banned for use. Moreover, many of the insecticides used by producers are applied using improper techniques that result in high amounts of wasted chemicals as well as an increased risk to producers, their families, water supplies and environmental quality. Pesticide containers are routinely disposed of on the ground or in waterways resulting in contamination of irrigation waters and poisoning of non-target organisms. Pesticides are often applied at excessive levels due to the “one size fits all” packages sold at agricultural supply shops. At the same time, shop owners often lack information on proper application techniques and this situation is carried through to the producers themselves. Producers indicated frustration with the lack of accurate information on application techniques, hazards associated with individual chemicals, and the poor availability of protective equipment.

- b. Producers in Tanangozi are routinely exposed to toxic amounts of agricultural chemicals including neurotoxic organophosphate insecticides such as Dimethoate and Fenitrothion. This issue was highlighted by a situation I observed on my first meeting with the group. Upon arrival at the meeting, I noticed that the chairman of the village appeared to be ill. After the meeting, we stepped aside for a private conversation where I asked how he was feeling. He agreed that he did feel ill and when I asked him for his symptoms, he described symptoms characteristic of exposure to anti-cholinesterase (neurotoxic) insecticides in the organophosphate and carbamate classes. Throughout the project, other producers also revealed their experiences with illness following applications of dangerous agricultural chemicals.

II. Expected impacts/results

- a. Reduced use of toxic pesticides on crops;
- b. Reduced risk of exposure to pesticides by applicators and other people;
- c. Reduced costs to producers resulting in higher personal profit levels;
- d. Reduced resistance in pest organisms, particularly insects;
- e. Increased sustainability of production processes.
- f. Decreasing levels of environmental contamination.
- g. Increased soil health through re-establishment of beneficial soil bacteria and soil structure.
- h. Greater protection of critical groundwater supplies which provide the bulk of water sources for irrigation in dry season months in Tanangozi as well as important sources of drinking water/household use water supplies.

III. **Recommendations**¹ I have made the following recommendations to Tanangozi producers regarding use of pesticides:

¹ **Note:** The most useful recommendations for hosts are ones that they can implement themselves with minimal expense. For example, a cooperative might change its financial reporting procedures or hold more



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- a. Use of proper terminology for purchasing agricultural chemicals. Several days of the project were spent discussing the need to understand proper terminology with an emphasis on differentiating between insecticides, fungicides, and herbicides (all of which are encompassed by the term “Pesticides”). As a result, producers are now able to ask agricultural chemical suppliers for specific compounds targeting specific type of pests (insects, plants, and fungus). Previously, they often asked for “pesticides” without understanding the different chemical classes.
- b. Use of proper personal protective equipment, application techniques, and labeling techniques. Most Tanangozi producers apply insecticides, fungicides, and/or herbicides using old backpack sprayers and without adequate personal protective equipment. We spent several days learning about, and demonstrating proper methods of application, use of personal protective equipment, appropriate sprayer maintenance and labeling, appropriate pesticide and fertilizer storage and mixing procedures, and placement of effective warning signs on fields (post-application), storage areas, and preparation areas. We also discussed the use of dilute bleach solutions for washing equipment and mixing areas. Bleach is the most effective tool for cleaning pesticide application equipment, tools, and other surfaces with pesticide contamination. Bleach hydrolyzes pesticide molecules, particularly the most toxic organophosphates and carbamates, and results in much less toxic breakdown products.
- c. Use of composting and mulching, implementation of crop rotations within farms, decreased need for external watering, reduced occurrence of insect pests and weeds. We discussed the wasted resources – livestock manure, crop residues that are burnt, human labor needed as a result of inefficient practices, etc. In addition, we discussed the need to rotate crops between crops in the Nightshade family (e.g. tomato, peppers, okra) and non-nightshade crops like pumpkin and maize. Rotation between these crop types would reduce significantly the need for pesticides (of all types), weed control, and watering, all of which are time and cost-intensive.
- d. Alternative pest control strategies. Many insect, plant, and fungal pests can be controlled, if not eliminated as an economic factor in production by use of GAP and Integrated Farm Management (IFM) as described above. However, there are likely to be cases in which pest organisms reach a level at which significant impacts to production (and profit) are likely. In those cases, use of “Reduced Risk” pesticides and naturally occurring pest control/suppression (e.g. “Dawa”) measures may be necessary. We discussed the potential of using Neem tree (*Azadirachta indica*) leaves or the leaves of sweet basil (*Ocimum* spp.) and other naturally occurring materials for control of insect pests. Producers can also use extracts from garlic (*Allium sativum*), hot peppers or pilipili (*Capsicum frutescens*), tobacco (*Nicotiana* spp.) or the ashes from burnt cow dung to control insect pests. Even with incomplete insect control

regular meetings of its board. Broad recommendations on tax or credit reform, changes in government policy, or investment in large-scale equipment, are usually not within the host organization’s reach.



that may occur with natural materials, losses from pests can be reduced to the extent that profits are increased due to the savings from lower pesticide costs.

- IV. **Fertilizers.** We discussed the use of composting and mulching, manure, and proper cultivation techniques as methods for reducing the need to purchase expensive and soil-damaging synthetic fertilizers. Synthetic fertilizers can alter soil microbiota, create excessive leaf growth at the expense of fruit/vegetable growth, and cause the build-up of salts in soils. Salinification of soil is a major problem in some irrigation-dependent crops and many synthetic fertilizers contain high levels of salts.
- V. **Water Source Protection.** Tanangozi and areas along the Ruaha river valley have significant groundwater resources. Although deforestation over the past thirty years has degraded the surrounding landscape, reduced wildlife populations, and reduced infiltration of precipitation, groundwater continues to emerge or exist close to the soil surface in many parts of Tanangozi. This resource is irreplaceable and contributes to the high relative value of farmlands in this region. More importantly, groundwater provides a predictable (e.g. constant) source of water, a quality that will increase in importance as climate change accelerates. However, groundwater is susceptible to pollution and evapotranspiration by exotic species such as eucalyptus and bamboo. Tanangozi farmers have several areas where groundwater reaches the ground surface and these locations are used extensively. Groundwater recharge zones are somewhat protected in the region due to rough terrain in the uplands. However, areas where groundwater occurs near the surface, or emerges as springs in the lower elevations are at risk from improper pesticide preparation areas and application methods, as well as from spills of oils and greases or other materials transported along Dodoma Road. Runoff from roads after during the rainy season also contributes toxic and conventional pollutants to streams, including groundwater-fed streams. Identification of springs and other waterways, and protection of those locations from potential spills of toxic or conventional pollutants should be a high priority for governmental agencies. We discussed the need to maintain natural vegetation along waterways (both surface and groundwater-fed) for filtration purposes and to keep human activity away from flowing waters. Improper disposal of pesticide containers and unused pesticide and fertilizer products was also discussed with suggestions made regarding appropriate sizes of riparian buffers, periodic maintenance of eroding stream banks and other factors that may degrade waterways.
- VI. **Crop rotation and diversification.** Rotation of crops within farms and the diversification of farm products was discussed as a means to respond to factors such as market demand, climate change, weather extremes, and others that are out of the control of individual producers. Intercropping, permaculture, and within and between-farm diversification was a common theme throughout the project.
- VII. **Livestock.** We discussed the use of livestock for manure production and forage utilization and for pest control (e.g. chickens) as a means of reducing workloads, improving yields and sustaining soil health. Currently, most livestock in the village are not utilized to the extent they could be used. Applying manure to fields is an important factor in reducing the use of costly synthetic fertilizers, methods of application and the multiplicity of benefits from manure were emphasized.



1.3 Number of people Assisted

- a) Through formal training
- b) Through direct technical assistance (Do not double count)
- c) Out of these above, number of host staffs
- d) Training/assistance by field

| Category | Total | Males | Females |
|--------------------|-------|-------|---------|
| Members/ owners | 24 | 20 | 4 |
| Employees | 00 | 00 | 0 |
| Clients/ Suppliers | 0 | 0 | 0 |
| Family Members | 1 | 0 | 1 |
| Total | 25 | 20 | 5 |

1.4 Gender

- a) What gender roles did you recognize in your host community? Did these roles play a part in your assignment? How? Very few women producers attended the trainings. Cultural issues appeared to play a part in this situation. Women also were busy with family matters during training sessions which could have played a part in the lower turnout.
- b) How might CRS or the host organization improve opportunities for the women in this host or host community? Altering the time of meetings to adjust for women’s schedules could improve female turnout.

1.6 Value of volunteer contribution in \$

- a. Hours volunteer spent preparing for assignment: 30 to 40 hours.
- b. Estimated value of all material contributions volunteer contributed to host during assignment: ~ \$100.00 US.

1.7 Value of hosts’ contribution in \$ (Please consult the host as well)

- a) Meals
- b) Transportation
- c) Lodging
- d) Translation
- e) Other (Specify): Use of Host’s home for meetings (Mr. Madati’s home for group meeting periods.)

1.9 Host Profile Data:

Did you obtain any data that supplements or corrects the data in the existing host information as detailed in the SOW? Please list it. **No.**

1.10 Recommendations for CRS:

1. Use the Ruaha University Executive lodging for volunteer housing in Iringa. This facility is excellent and less expensive than the Wilolesi hotel. I do not recommend use of Wilolesi hotel due to problems with management. These problems could not have been foreseen by CRS staff; I moved



to the Zakinn hotel on Old Dodoma road. However, this hotel also had some issues but was very comfortable. I visited the Ruaha University suites during a visit with friends and found it to be perfect for longer-term stays.

2. Ensure that the interpreter (Mr. Dunstan Mpangala) has sufficient and suitable transportation for rough roads, etc.. Mr. Dunstan was an exceptional colleague and my work would not have gone nearly as well without his outstanding input and interpretation. I highly recommend Mr. Mpangala for all interpretation work in Iringa. He was excellent.
3. Provide additional per diem for volunteers due to the fact that hotels often did not serve breakfast early enough to address early morning departures for work, etc. Finding volunteer housing that includes a small kitchen would assist greatly in saving money. I had to eat at the hotel and or restaurants and that was expensive and often inconvenient. However, this was not a problem for me since I was able to contribute my own money in some cases. I did provide Mr. Mpangala with \$100.00 for emergency car repairs due to rough conditions in Tanangozi village. However, I wish that this not be attributed to Mr. Mpangala since he did not request this assistance; I could tell that he was worried about it and I offered my help. Otherwise, we may not have been able to reach Tanangozi on all days necessary.
4. I strongly urge CRS and the Farmer to Farmer program to have follow up projects with the same volunteer and the same group. Follow-up is critical to project success and I hope to return to Tanangozi via CRS and Farmer to Farmer to ensure that recommendations are followed and to build upon the excellent relationship we developed. In addition, I know the town and surrounding area now and a return trip would not require up front work or preparation for a volunteer like myself that requires knowledge of regional ecological systems.
5. Finally, I would like to say that this was the best Farmer to Farmer program I have yet to attend. The outstanding work of Mary K. and Ufoo U. and others was apparent to me throughout the project. The drivers, Steven and John were excellent drivers as well; they indulged my need to take a few photos on the road and also provided safe and comfortable service.
6. All in all, CRS has done an outstanding job with the Farmer to Farmer program and I hope to return to Tanzania to continue this important work.