

VOLUNTEER REPORT FORMAT

1.1 Assignment information

- a) Volunteer Name: Udai Ram Bishnoi
- b) State of Origin: Alabama, U.S.A
- c) Host Organization: Adigrat University, Agricultural College, Department of Plant Science
- d) Assignment: Crop Production improvement and Seed selection
- e) Dates of Assignment: December 1 – December 15, 2017
- f) Number of days worked: 12

1.2.1 Objective 1: Visit of farmers crop field/ Operation**a) Progress with the Objective:** Visited three wheat farms in **Fatsi**.

The farm soil looks to be adequate to produce crop however, it has lot of rocky/stone pieces ranging from 5 to 10 cm in diameter. Farmer was not present on the farm so it is difficult to visualize his problems related to soil fertility and production of crop/s. But, looking at the intensity of stubbles of wheat it seems that there was a good crop. I stopped by road side to see how two other farmers were threshing their harvested wheat.

b) Expected impacts/Results: The visit of the farms was intended to stimulate broad based concepts to increase natural and sustainable production practices. With out presence of farmer it is hard to visualize the real production constraints. Mr. Gebrelibanos, Head of Plant Science Department was with me and he pointed out that farmers' real problem is low yield of crop.

The threshing methods involve use of animal tremping over wheat straw in a very clustered method while farmer keep turning straw with use of wood fork continuously. The entire system seems to be very inefficient and cruel to animals and even for the health of farmer as well as animals.

c) Recommendations:

Low wheat yield from the farm can be improved through:

1. With timely planting, rotating wheat with legume crop (ex. Chickpea) and by use of drought resistant variety of wheat.
2. Use of high quality seed, compost or farm manure and control of weeds especially during first 4-6 weeks growing period of wheat can increase wheat yield by 20-25%.
3. For easy farm operations, rock pieces over 5-10 cm diameter need to be removed from crop planting area of farm land.
4. Threshing of wheat can be done by placing straw in a ring with width to accommodate number of animal used in trembling of straw. Animals can be yoked or tied together by neck with rope. The yoke or rope then can be attached to an installed pole in center of the ring. Animals will then

be able to walk freely over straw guided by one person. Once top part of straw is half threshed, take animal out from ring to turn over the unthreshed straw from bottom of the ring. Once wheat gets threshed, remove it with grain and repeat the operation for remaining unthreshed wheat. In this system, animals are safe of injury from sharp end of wood fork nor have straw thrown in their eyes nor on their body.

5. A farmer or group of farmers can also purchase wheat thresher and can avoid use of animals.

1.2.2 Object 2: Seed selection for quality

a) Progress with the objective: Quality of seed start from genetical make up of a variety, multiplication practices of its seed in field, seed cleaning from impurities, seed storage and testing for germination before planting a commercial crop. As stated in the scope of work that seed used in planting are impure, low in viability leading to poor and scanty stand establishment of crops. Low in plant population will cause low yield. To improve seed quality, department's faculty/staff and students were given six separate 1-2 hour seminars with focus on:

- How to select breeding material for desired type of variety,
- How to multiply its genetically pure seed,
- How to clean, store, and test its physical purity, germination percentage and plant a crop based on pure live seed percent ($\text{Pure seed \%} \times \text{Germination \%} / 100$) to obtain desired plant population of a crop field.

b) Expected Impacts/Results: The seminars were intended to stimulate broad based thinking on how they can select breeding material, how to breed/develop variety, how to multiply genetically pure breeder, foundation and registered seed to produce high quality certified seed. The seminar's emphasis was on how to store seed even for 2 to 3 years, how to take samples to test its purity and viability before seed gets to farmers for planting. Written scientific materials on each and every aspect of the seed program has been shown to participants and copies are given to head of plant science department for distribution to interested faculty, staff and students. List of equipments required for purity testing, from where to obtain it and procedure to conduct purity test has also been given and discussed with department head and faculty. Handouts on how to produce wheat seed, how to and with what to treat seed against disease/pests have been given to make good seed into better seed. Examples of on farm seed production in Gambia/Senegal and commercializing seed in small holders markets in Kenya, Malawi, Mozambique and Zambia were discussed and material was given to the department for future use.

c) Recommendations:

1. To achieve goals on quality selection and use of seed, plant science department need a well trained practical plant breeder, need seed multiplication specialist, need a trained seed analyst and a well equipped seed testing laboratory.
2. The department needs temperature/humidity adjusted seed storage. Many faculty need to receive training/terminal degree in their specialization.
3. I have given names of many large seed companies to department head/faculty to contact for technical and or financial help to pursue seed program at Adigrat University.

1.2.3 Objective 3: Crop Production Improvement

- a) **Progress with the objective:** Various production aspects on wheat, maize, sorghum and legumes were primarily addressed. Very little was covered on details of their production agronomy due to time constraints. Detail outline on production guideline on their major crop wheat and planning crop rotation was discussed and given with handout. A special article on **prospective of sorghum and malting barley production** was mentioned to the department and latest article on each has been left with department. Due to farmers' inability to buy commercial fertilizers, I recommend the use of compost/farm yard manure and make them on the farm.

A bulletin describing with illustrations has been given to department to train farmers on compost making. How to increase yield based on environment and architecture of crop plants has been outlined and a book on **Understanding Crop Production** has been donated to the department for detail information. Articles on "Seeking drought tolerance" in crop plants, Use of gene Sr13 and Sr35 to develop wheat variety resistant to stem rust, gene for "super corn" described by CIMMYT (in Mexico) scientist to boost yield of maize in arid countries and how rice yields was doubled (in China) simply by planting mixed varieties has been given to department head for the use of crop production agronomists. Also, I have donated a book on, **Building Soils for better crops** with outlines on how to manage soil to increase crop yield.

- b) **Expected Impacts/results:** The adaptation and practical use of materials mentioned above on many of the small holder farmers can dramatically increase their crop yield/profit. This approach seems to be working in many Asian, Soviet Block countries and to some extent even in Kenya. In addition, faculty needs to encourage farmers to use improved crop cultivars, fertilizers, manures based on soil testing. Many other modern farming practices can be used for teaching in classes and extension activities. Young graduates, farmer's sons and daughters need to adopt new technology. Faculty should

write extension publications on know how of crop production methods, disease/pest control in local language for farmer's use.

c) Recommendations:

1. Send few scientists for training/degree to specialize in crop production under dry land conditions. University of Arizona, Texas State University at Lubbock in Texas or CAZRI in India may be desirable for such specialization.
2. Implement 3-4 years crop rotation schedules for farm with mono or mixed cropping for maximum profitability. Rotation improves soil structure, soil fertility, reduce pest/disease problems and will increase crop yields.
3. Add sorghum, pearl millet, cassava, cluster bean, moth, moong beans in cropping system
4. Manage to access fertilizers, improved seed-germplasm, farm equipments, irrigation, plant protection chemicals, and soil testing services.
5. Treat crop production as a business with set short and long term goals using existing resources for a profitable operation.

1.3 Recommended future volunteer assignment:

1. Volunteers are needed to teach **(a)** small farm management; **(b)** use of chaf cutter and **(c)** use of wheat thresher.
2. Volunteer be made available for 20-30 days in each area as and when requested by plant science department.

1.4 Action Plan:

Follow all recommendations listed for each objective with an action. College Dean/Department head should take responsibility for action and to achieve goals within 3-5 years.

1.5 Number of people Assisted

- a) Through formal training (Classroom setup): 89
- b) Through direct hands on practical assistance (Do not double count): 27
- c) Out of these above, number of host staffs: 0
- d) Training/assistance by field: 3

Category	Total	Males	Females
Undergraduates	89	48	41
Employees	27	19	8
Clients/ Suppliers	3	3	0
Family Members	0	0	0
Total	119	70	49

1.6 Gender

- a) What gender roles did you recognize in your host community? Did these roles play a part in your assignment? How?
 - ❖ Female faculty and students were more active in discussion and asking questions.
- b) How might CRS or the host organization improve opportunities for the women in this host or host community?
 - ❖ Involve more female farmers in program activities and with volunteer's work.

1.6 Value of volunteer contribution in \$ =**120**

- a) Hours volunteer spent preparing for assignment: **30**
- b) Estimated value of all material contributions volunteer contributed to host during assignment: **120**

1.8 Value of hosts' contribution in \$ (Please consult the host as well)

- a) Meals
- b) Transportation
- c) Lodging
- d) Translation
- e) Other (Specify)

1.8 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. **None**

1.9 Recommendations for CRS:

1. Dean of College and head department of plant science are excellent host and serious to take actions on recommendations. Therefore, F2F program should be extended at least for one more year.
2. F2F program activities should be undertaken at a time when students are at campus and during growing season of crops.
3. Plant science department should offer a course in **small farm management** and every senior students should take a project (Demonstrations) with 2-3 farmers on new production techniques.
 - ❖ Most CRS personnel are very prompts and are dedicated in managing and organizing volunteers' paper work and travel.



- ❖ I am real thankful to my host Mr. Gebrelibanos head of plant science for organizing a wonderful training program.
- ❖ Help from Mr. Biruk Tesfaye and Dag of F2F program and CRS personnel, Mr. Aregay, Mebrahtu Yihdego in Adigrat are very much appreciated.

1.10 Press Release

FOR IMMEDIATE RELEASE

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