

U.S. Department of Agriculture (USDA)
Training in Afghanistan with U.S. Army Corps of Engineers on Small-Scale
Projects to put people to work at Rehabilitating Degraded Watersheds
U.S. Army Corps of Engineers – Khost, Afghanistan
11-14 June 2009
Revised 5/17/09

Workshop Description

Summary: This 4 day workshop will address a variety of basic soil and water conservation techniques that are potentially useful in the rehabilitation of degraded watersheds. Learning will be accomplished with a combination of the following:

- Lecture and discussion of different techniques grouped as training modules
- In class exercises and demonstrations at the end of specific training modules
- The development of specific watershed designs

Basic materials/equipment will be provided to each participant. The use of the equipment will be discussed during the workshop modules. This material/equipment will be sufficient to conduct basic level investigations, create designs, and implement projects along the lines of what is presented in the workshop. Students should bring a calculator and materials for taking notes. In addition, the students should review the design exercise topics and consider which are most similar to their area and consider one that they would like to work on during the class. Background materials for the design exercises are listed.

Module Topics:

The following topics will be presented and discussed on a basic / low tech level.

- Basic Surveying
- Grazing Management
- Soil Conservation – terraces, hillside ditches, and check dams
- Irrigation – Overview of different types
- Soil Augmentation with Compost
- Planting in Dry Areas
- Seed Collection and Storage
- Tree Nurseries (establishment and management)
- Use of seedlings and cuttings
- Tree species collection
- Site preparation for tree planting
- Tree planting crew management
- Planting Windbreaks
- Water Supply (Spring Development, Cisterns, Water filtration)
- Stream/River Stabilization (streambank soil bioengineering, riparian buffers, riprap, stream deflectors).

Agenda:

The following agenda indicates the topics that will be covered by day. Days will start at 8 am and finish at 5 pm. The instructors will be available in the evening for additional consultation and discussions. The schedule is flexible and additional time may be allocated to topics based on the interest of the workshop participants. Lunch and breaks will be scheduled at needed times.

Day 1

Morning (start at 9:30):

Greetings (0.5 hr)

1 - Overview of workshop and Introductions (1 hr) Jon Fripp/George

Hernandez

FAS's international development work (0.5 hr) Dr. Li

Water Management and Experience (0.5 hr) Gary Domain

Lunch 12:00-1:00

Afternoon:

Upland Watershed Rehabilitation

2 - Watershed Zones (0.5 hr) Jon Fripp

3- Advantages of Vegetation (0.5 hr) George Hernandez

4- Soil – Vegetation Relationships (0.5 hr)

5- Planting in dry areas (0.5 hr)

6- Basic Surveying (1 hr)

7- Rangeland Management (1 hr)

8- Terraces and Hillside Ditches (0.5 hr)

(end at 5:30)

Optional Evening Session (7:00-8:00)

Class Discussion (1 hr): Experiences of participants. Suitability of discussed measures to projects and areas or responsibility

Day 2

Morning (start at 8:00):

Upland Watershed Rehabilitation (cont'd)

9 - Check Dams (0.5 hr)

10 -Gabions (0.5 hr)

Gabion Construction exercise (0.5 hr)

Streams and Rivers

11 - Riparian Buffers (0.5 hr)

12 - Soil Bioengineering (0.5 hr)

13 - Riprap (0.5 hr)

14 - Stream Deflectors (0.5 hr)

Stream Deflector Design exercise (0.5 hr)

Lunch 12:00-1:00

Afternoon:

15 Windbreaks (0.5 hr)

Irrigation

16 Overview of types (0.5 hr)

- 17 Drip Bucket (0.5 hr)
 - Drip Bucket Construction exercise (1 hr)
- Water Supply and Treatment
 - 18 Overview (0.5 hr)
 - 19 Spring Development (0.5 hr)
 - 20 Cisterns (0.5 hr)
 - 21 Filtration (0.5 hr)

(end at 5:30)

Optional Evening Session (7:00-8:00)

Class Discussion (1 hr): Experiences of participants. Suitability of discussed measures to projects and areas or responsibility

Day 3

Morning (start at 8:00):

- Soils and soil amendments
 - 22 Soil Types (0.5 hr)
 - Soil Type exercise (0.5 hr)
 - Soil pH test exercise (0.5 hr)
 - 23 Compost and its uses (0.5 hr)
 - 24 Compost Toilets (0.5 hr)
- ACC work and experience (1 hr) ACC Nursery
 - 25 Overview (0.5 hrs)

Lunch 12:00-1:00

Afternoon:

- Nursery (cont'd)
 - 26 Nursery Design (1 hr)
 - 27 Nursery Operations (1.5 hr)
 - Afghan Nurseries (1 hr) ACC
- Watershed Evaluation Checklist (1 hr) Gary Domain

(end at 5:30)

Optional Evening Session (7:00-8:00)

Class Discussion (1 hr): Experiences of participants. Suitability of discussed measures to projects and areas or responsibility

Day 4

Morning (start at 8:00):

- Review presented material (0.5 hr)
- Students Select Specific Watershed Design topics (see description below) and divide into work groups (0.5 hr)
- Prepare Design and Presentations (2.5 hr)

Lunch 11:30 - 12:30

Afternoon:

- Group Design Presentations (2 hrs)
- Summary and closeout (0.5 hr)

(end at 3:00)

Specific Watershed Designs The workshop participants are encouraged to review the list of 5 design exercise topics presented below. They should select one that most closely matches issues that they may be dealing with in their area of responsibility. Bring as much of the indicated background information as available to work on the design as part of the class. Be prepared to present planning and design at the end of the workshop. If you do not have the necessary information for a design select a topic of interest and you will be able to work with another participant.

Exercise Goals:

1. To allow workshop participants to demonstrate understanding of the presented techniques.
2. To provide an opportunity for workshop participants to begin the development of plans for their areas of responsibility.
3. To provide a discussion forum to address how the presented watershed techniques may need to be modified for local conditions.
4. To facilitate communication between participants and instructors so that consultation can be more readily accomplished in the future.

All of these designs are to be developed at an awareness level focus.

Design Exercise Topic 1: Watershed Rehabilitation

Objective: Develop a watershed rehabilitation plan for a degraded upland watershed.

Task: Using a topographic map and photos, design a hillside ditches, terraces, and check dams. The design should include the pertinent engineering (slope, height, etc.). Develop a plan to involve local civil authorities and residents, gabion construction, including materials needed, man power required etc., where and how to acquire materials, construction scheduling, etc. Use photographs determine the appropriate grazing capacity of the site; determine soil type, determining the best means of involving the locals to develop a grazing schedule and rehabilitating the overgrazed site. Water sources for livestock (spring developments, wells, etc)

As feasible: bring as much of the following information about your site as possible:

- Topographic maps
- Photos
- Relevant filed measurements of gullies as available
- Personnel to play the role of civil authorities and locals
- Materials to construct gabions
- Livestock (type and number estimate)

- History of land use
- Current land use
- Current land condition
- Soil condition (soil sample)
- Vegetation (grass sample)

Design Exercise Topic 2: Windbreaks:

Objective: Design a windbreak.

Task: Using photographs design a windbreak to protect the threatened resources (an aquifer recharge zone, a village, an agricultural field). Determine soil type, species to be used, develop a planting plan to include, where and how to acquire the materials (grow, purchase locally, or contract with locals), optimal time for planting, man power needs, after planting care, etc) Develop a plan to involve local civil authorities and residents.

As feasible: bring as much of the following information about your site as possible:

- Topographic maps
- Background or oral information of wind direction and duration
- Photos
- Soil and materials for determining soil texture
- Water source for irrigation
- Personnel to play the role of civil authorities and locals

Design Exercise Topic 3: Nursery Design and Management

Objective: Design a nursery and develop a nursery management plan.

Task: Design a nursery, determine soil texture in order to develop a soil management needs, determine irrigation system best suited given site selected, determine nursery capacity required, develop crop schedule. Develop a strategy to acquire seeds, clean seeds, and store seeds. Develop a crop schedule (planting time, harvesting time, etc.). Address inside and outside plant production/management. Determine labor required to clear, prepare site, and grow crop. Assess water source and propose improvements as needed. Develop a plan to acquire a nursery site, determine how to involve local civil authorities and residents.

As feasible: bring as much of the following information about your site as possible:

- Topographic maps
- Photos
- Plant species of interest

- Purpose of nursery
- Soil and materials for determining soil texture

Design Exercise Topic 4: Irrigation

Objective: Design the irrigation for 2 projects.

Task: Determine the most efficient means for irrigating a project by establishing the water requirements of the crop, water source, technique most likely to be adopted, and layout the irrigation for the project. Assess water source and propose improvements as needed. Develop a plan to involve local civil authorities and residents.

As feasible: bring as much of the following information about your site as possible:

- Topographic maps
- Photos
- Crop to be irrigated
- Current irrigation
- Soil and materials for determining soil texture
- History of land use
- Current land use

Design Exercise Topic 5: Stream/River Bank Stabilization

Objective: Develop a bank stabilization plan.

Task: Determine the best method to stabilize an eroding stream bank (gabion, logs, fascines, stream deflectors, etc). Develop a design utilizing each of these methods. Determine manpower needs. Develop a plan to involve local civil authorities and residents.

As feasible: bring as much of the following information about your site as possible:

- Topographic maps
- Photos
- Cross section information (height of bank, width of river, etc)
- Soil and materials for determining soil texture
- History of riparian land use
- Current riparian land use