**OL 332 Assignment Five Homework**

**Online Learning: OL 332 Water Conservation & Management**

**Center for Sustainable Development.** <https://csd-i.org/ol-332-water-conservation-management/>

**Field Guide: Developing Water Use Management Plan.**

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A shortage of water or unreliable access to water is one of the biggest issues in development. Community water sources dry up during climate change related drought—or seasonally during the dry season. There is competition among different segments of the community for available water. Discussing community water harvesting calls for stepping back from the immediate problem and looking at the relevant underlying causes for the shortage of water in order to begin developing solutions.

**Community based water management committees.** Forming a water management committee is the initial step in developing a water management plan. A committee can provide direction, consistency, management, regulation and enforcement.

The first step in forming a water management committee is to introduce the concept in a participatory workshop setting; ask your community contacts to approach community members about participating in a water management workshop. In the workshop you can begin by introducing the rationale and importance of having a community based water management committee who can develop a plan for improving access to water.

Discuss the types of skills that will need to be developed by committee members. Suggest appointing an interim committee who over the course of six months could develop the ultimate committee, establish management responsibilities, ensure gender inclusiveness, set goals, and initiate the planning process. Ask the workshop participants to decide on the number of people that should serve on the committee—and then ask if there are members who would be interested in sitting on the interim committee.

**Water use management plan.** The first step in developing a water use management plan is to better understand what knowledge community members have about water resources and water use. A simple way to do this is to hold a participatory mapping workshop to look at the community's water resources, distribution, uses, and weather related challenges. Field Guide 5 tells how to do this first step.

Having identified the community’s sources of water, how the water is distributed, how the water is used, when there's too much water and when there's too little water, you can begin the process of developing a plan which would include:

1. Consulting with a water management expert to develop a participatory training and planning program.

A water management professional will be able to help the community assess their unique situation and propose solution oriented activities appropriate for community context, capabilities and resources.

2. Prioritizing which challenges to approach first.

The challenge of not enough water could be due to unequal allocation, deforested catchment areas, existing infrastructure that is in disrepair, or it could be that new, alternative sources have not been explored. In the community's existing context, determine which challenge, if solved, will give them the greatest increase in water access at the lowest cost.

3. An investigation into the restoration of environmental services.

If the watershed around the village has been deforested over time, it's possible that rainwater simply runs off the hillsides rather than infiltrating into the soil and recharging the local water table. The water management expert can help with this determination and help develop a plan for reforestation.

4. An investigation of water sourcing alternatives.

The best alternative may be to look for new sources of water. This could include a new well, or it could include water harvesting structures to channel water to a community storage reservoir.

5. The development of an infrastructure installation, maintenance, and repair program.

Two of the main reasons why water systems fail over time is that they weren't designed by experts and they weren’t maintained by the community. A sustainable water use management plan needs to take into consideration expertise in both design and installation oversight, and a plan for funding and implementing routine maintenance.

6. The development of a water allocation plan.

The community may have sufficient water but a wealthy farmer or nearby factory may be using more than their share. Developing an advocacy plan to approach the local government can begin the process of creating an allocation plan which is fairer to the community. An allocation plan will also ensure that new community water resources are distributed fairly among different segments of the community.

7. Compile these steps into a comprehensive water use management plan.

Completing these steps could take a year or more but when they are done, they need to be compiled into a master water use management plan. The water management committee should be in charge of overseeing the development of the plan's components, of collecting water use fees, and of enforcing the plan.

**The water challenge.** Here is an example project detailing water challenges and solutions that are typical in rural settings. During the course of their investigations a water use management committee determined that deforestation of the hilly watershed behind the village has led to rainwater runoff that causes soil erosion, the creation of gullies, siltation of the main stream bed, and occasional flooding in the village during heavy rain. The downhill movement of rainwater is no longer slowed by trees and undergrowth; it no longer slowly infiltrates into the soil and recharges the local groundwater system. This is evident in the fact that the village well and the streambed are frequently dry.

**The water management plan.** The committee decided upon a triple plan: a soil and water conservation program in the watershed, a reforestation program for the watershed, and the construction of a subsurface dam in the dry streambed adjacent to the village well.

With the help of a watershed management expert, a more detailed map was drawn of the village's watershed showing where rivulets and gullies direct rapidly flowing rain water away from the watershed. The expert suggested locations for 12 check dams on these gullies—and said they should be the first step. Their purpose is to slow the velocity of water movement thereby reducing erosion and allowing water to infiltrate into the soil.

Water infiltration will recharge local groundwater systems and provide soil moisture for the reforestation program. A reduction in runoff from heavy rains will reduce flooding in the village. Over time, soil accumulating behind the check dams will begin the process of filling in the gullies.

The plan is to start a tree seedling nursery of native trees, and at the same time begin the construction of the 12 check dams. The villagers are concerned about building the subsurface dam near the village until the check dams have been put in place; they don't want the subsurface dam to wash away during a flood if the check dams are ineffective. They have time now to build the check dams before the next rainy season—and they will have tree seedlings to plant alongside the gullies and rivulets when the rainy season begins. If their check dams are successful and the village doesn't flood, then they will feel comfortable building the subsurface dam in the riverbed at the beginning of the next dry season.

Because of the expense and engineering requirements of concrete check dams the community decided to experiment with very simple, inexpensive check dams to ensure that they were going to be effective. Two kinds of check dams were chosen: loose stone and brushwood. They are semi-porous: some water will pass through them and reduce water pressure build up. Consequently the engineering requirements are minimal. Rainfall conditions, terrain and building materials vary from location to location, and the check dam expert helped the community members decide the size and configuration of their dams. Three workshops have been planned. A one-day workshop to build a brushwood check dam, and a two-day workshop to build a loose stone check dam. These check dams will be made of locally found materials. If effective, these low-cost check dams could be replaced over time with more permanent structures.

**Lesson Plan for an Introduction to Developing a Water Management Plan. A workshop for committee members.**

**5 1/2 hours plus lunch (can be completed in two, 2-1/2 hour workshops)**

**PURPOSE:** What workshop participants will be able to do as a result of the lesson.

**Objective 1:** Participants will understand the importance of having a Water Management plan.

**Objective 2:** Water related risks, community vulnerability and capacity will be clearly spelled out.

**Objective 3:** The need for mitigation and potential mitigation activities will be clearly spelled out.

**Objective 4:** Important elements for the plan and a framework for developing the plan will be carefully spelled out.

**PREPARATION**

* A Community Based Water Management committee has been formed.
* A participatory capacity and vulnerability assessment has recently been completed.

**MATERIALS**

* Artist’s drawings/posters; the scenes and people they contain should appear familiar to workshop participants.
* Large sheets of newsprint and tape. Colored markers.

**BEGINNING OF LESSON:**

**Activity 1. One Hour. Introduction to the benefits of having a Water Management plan**

**Purpose:** Committee members will understand the benefits of having a Water Management plan.

**What to do**

1. Introduction to workshop: Tell the participants what they’ll be able to do as a result of the lesson.
2. Participants will learn that community members are frequently unaware of how and why water challenges originate.
3. They will learn that there are techniques for reducing the risk caused by water challenges.
4. They will learn that a plan can be developed to help community members reduce each area of risk.
5. Let them know that a water management professional will accompany them on the journey of developing the plan
6. Assign one committee member to be responsible for the overall production of the plan.
7. Discuss how the plan may take several months to develop.

**Workshop Participants:**

Have participants talk about what they do and don’t understand, what they do and don’t like.

**Activity 2. One hour. Prioritizing the results of the participatory capacity and vulnerability assessment**

**Purpose:** To review, prioritize, and clearly state the results of the recently completed PCVA.

**What to do**

1. Clearly note what water related risks the community suffers from or may potentially suffer from.
2. Clearly note where (location) the community is most vulnerable and which community members are most vulnerable.
3. Clearly note what livelihood assets and resources are most vulnerable.
4. Note what the community's knowledge of water conservation and water management are.
5. Make a prioritized list of the vulnerable locations in the community, and livelihood assets and lives most at risk.

**Workshop Participants:**

Have participants talk about what they do and don’t understand, what they do and don’t like.

**BREAK: 15 MINUTES**

**Activity 3. 30 minutes. Introduction to consciousness-raising within the community**

**Purpose:** For committee members to better understand the need for consciousness-raising within the community.

**What to do**

1. Review what the community members do and don't know about water management.
2. Discuss how some community members are illiterate and so posters and handouts should not have written words.
3. Describe different ways of getting information out to the community to increase capacity and develop responsibility.
4. Discuss how important schools and school children can be in disseminating this information.
5. Discuss how after initial consciousness-raising, teams will need to provide capacity building to the community.

**LUNCH: 30 minutes.** If the workshop is to be held in two sessions, this is a good breaking point.

**Activity 4. 30 minutes. Introduction to the restoration of environmental services**

**Purpose:** For participants to learn what environmental services are and how important they are.

1. Participants will learn that watersheds provide both agricultural and household water.
2. Discuss how deforested watersheds can reduce the amount of water available year-round and contribute to flooding.
3. Tell them how reforesting watersheds can allow for rainwater to percolate slowly into the soil and be released over a longer period of time.
4. Describe to them how reforesting watersheds can reduce soil erosion and the silting up of rivers.
5. Tell them how by plugging gullies they can also restore soil in a watershed can reduce flooding.
6. Discuss with them how a plan for restoring the watershed can be phased over several years.

**Activity 5. 30 minutes. Introduction to water harvesting**

**Purpose:** To learn about different kinds of water harvesting.

**What to do**

1. Describe how earthen dams can collect and store rainwater.
2. Describe how rocky outcroppings can collect and store rainwater.
3. Describe how subsurface dams can help in recharging wells adjacent to try streambeds.
4. Describe how gutters connected to the eve of houses can collect water which can be stored in barrels or ponds.
5. Describe how household level water purification is a health benefit to community members.
6. Describe how by working with a water management expert they can receive assistance in identifying the best options.
7. Describe how the water management expert can also help them with larger storage system such as reservoirs.

**Activity 6. 30 minutes. Share with them the challenges and solutions that you've investigated over the past few assignments**

**Purpose:** To have a simple introduction to potential design approaches for their project.

**What to do**

1. Describe the basic environmental restoration techniques that you studied.
2. Describe the basic water harvesting techniques that you studied.
3. Describe which of the techniques that you studied may be most appropriate for the community's challenges.
4. Describe which of the techniques may be the best fit for their skill sets and their resources.
5. Show them how several of the techniques fit nicely into their original project outline.
6. Show them how several of the solutions look superimposed on their hazard map.
7. Ask for their feedback on which of the techniques are most interesting to them and why.
8. Ask for a vote on the prioritization of the techniques.

**Workshop Participants:**

Have participants talk about what they do and don’t understand, what they do and don’t like.

**BREAK: 15 MINUTES**

**Activity 7. 30 minutes. Discuss the various steps in developing a plan**

**Purpose:** To discuss the steps in developing a water management plan over a six-month period of time.

**What to do**

1. Consult with a water management expert to develop a participatory planning program.
2. Prioritize which challenges to approach first.
3. Investigate the restoration of environmental services.
4. Investigate water sourcing alternatives.
5. Investigate water harvesting alternatives.
6. Prioritize the alternatives, estimate time for implementation, estimate costs (cash and labor costs).
7. Discuss designing an infrastructure installation, maintenance, and repair program.
8. Discuss who will be in charge of the design of the different alternatives of the plan.
9. Discuss who will be in charge of the different components of developing the plan.
10. Compile these steps into a comprehensive water use management plan.

**Workshop Participants:**

Have participants talk about what they do and don’t understand, what they do and don’t like.

**BREAK: 15 MINUTES**

**Activity 7. 30 minutes. Conclusion**

**Purpose:** To review the elements of developing a water management plan.

**What to do**

1. Reinforce the benefits of developing a water management plan. Review the basic components of the plan.
2. Review who is in charge of which components (the writing of the plan and the formation of the teams).
3. Set a goal for a timeframe of completing the plan. Set a goal for a timeframe for implementation.
4. Your NGO will help in developing the plan.
5. Ask the committee members for initial feedback on which of these activities presented in the workshop are the most interesting/appropriate for their needs. This is not a binding list – but will help start them thinking about what may need to be included in a plan.
6. Ask the committee members which one of their selected activities would they feel would be the best one for the first community member training workshop.
7. Have participants talk about what they do and don’t understand, what they do and don’t like.

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