

## A. Small Water Impounding Project (SWIP)

A small scale earth dam structure with height of 5 to 15 meters, constructed across a narrow depression or valley to collect and store rainfall and runoff during rainy season for immediate and future use.

### Major component of water impounding system

#### 1. Watershed



Watershed is the area that contributes water for impoundment, serves as a water collecting and natural storage facility. It is hydrologically stable if

#### 2. Dam and Reservoir Area



Reservoir



Embankment  
(modified homogeneous earthfill)



Spill way

## 3. Irrigation distribution facilities

Consisting of facilities for the purpose of releasing and controlling water to the farm and distributing water to the service area .



Intake control structure



Outlet structure



Lined canal structure



Earth canal structure

### Uses of SWIP

- collect and store surface run-off water during the rainy season for immediate and future use
- conserve soil and water
- irrigate crops and/or water livestock
- use for fish production or duck raising
- minimize flooding
- minimize soil erosion and siltation of fertile bottom lands
- use as a community recreational area

### Beneficiaries of SWIP

- organized farmers' association (FA)
- areas with no "rights of way" and other social problems
- FA that is capable and willing to shoulder full cost of operations and maintenance

## B. Diversion Dam (DD)



A concrete or rockfill structure constructed across a channel or river with continuous flow to raise the water level and allows diversion of water by gravity from the source to the service area

### Physical components

Components consist of watershed area, concrete dam, (ogee shape or broad crested weir), outlet works and irrigation & canal facilities and appurtenant structures.

### Uses of DD

- Supplemental irrigation for small farm holders

## C. Pump Irrigation System from Open Sources (PISOS)



In this type of irrigation system, a pump is used to lift water from river, stream, marsh to the main canal for the distribution to the service area

### Features:

- low investment cost
- high water use efficiency (75%)
- simple to operate and maintain
- sustainable development
- empowerment of farmers

# Small Scale Irrigation Technologies

## D. Shallow Tubewell (STW)



### Site Criteria for STW

1. Average slope of irrigable area is within 0-3%
2. There is potential for shallow tubewells with safe yield of 100 gpm or more. Suction head not exceeding the allowable 6.5 m for centrifugal pump.

Potential shallow groundwater source areas are those:

- a. ground water table depth is located 2 to 3 meters or less below ground surface at the onset of the dry season.
- b. top soil profile is 1 to 2 meters deep and the succeeding 3 to 7 meters thick are sand and gravel.
- c. soil texture is light to medium. Whenever possible, information on depths of the water table, groundwater yield must be obtained from existing wells nearby.

An irrigation system consists of one or more fully developed shallow tubewell equipped with appropriate pumping units that can serve a contiguous area owned by an individual or groups of farmers. An STW pumping unit consists of a centrifugal pump powered by a 5-10 diesel engine or electric motor. A tube or pipe vertically set into the ground at depth of 20 to 60 feet for the purpose of suction lifting of water from shallow aquifers. The tube or pipe usually is a 3" to 4" diameter schedule 40 G.I. pipe.

### Features

- can irrigate 3-5 ha per unit
- low investment cost
- high water use efficiency
- simple to operate and maintain
- short gestation period (2-3 weeks)
- sustainable development
- empowerment of farmers



## E. Small Farm Reservoir (SFR)



### Ideal sites for SFR

- SFR can be constructed in flat areas or sloping land with up to 18% slope (undulating topography is most suitable)
- Soil type for embankment are loam, sandy loam, sandy clay loam or clay loam
- There is sufficient watershed area
- Average annual rainfall is 1,5000 mm
- Farm size is about 0.5 ha or larger.

### Uses and benefits of SFR

- ensure crop intensification and diversification
- ensure improved farm income
- recharge ground water
- minimize soil erosion and nutrient losses

A small water impounding earth dam structure to collect rainfall and run-off, designed for use in a single farm, and typically has a reservoir area of about 300-2,000 m<sup>2</sup>. The embankment height above ground level is less than 4 meters. It can easily be constructed with a bulldozer or manual labor. Irrigation is done with PVC siphon pipes or pumps.

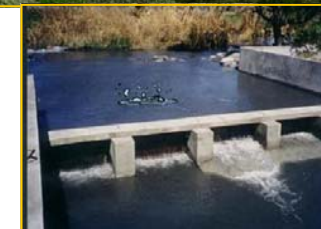
### Advantages of SFR

- less capital intensive
- easy to construct and maintain
- empower individual farmers



For further information please contact:

Water Resources Management Division  
Bureau of Soils and Water Management  
Elliptical Road, corner Visayas Ave. Diliman, Quezon City, Philippines  
Tel. (02) 9230462



Department of Agriculture  
BUREAU OF SOILS AND WATER  
MANAGEMENT