SPRINKLER IRRIGATION SYSTEM

SURVEY AND COLECTING DATA

What is sprinkler irrigation system?

A sprinkler irrigation system generally includes sprinklers, laterals, submains, main pipelines, pumping plants and boosters, operational control equipment and other accessories required for efficient water application. In some cases, sprinkler systems may be pressurized by gravity and therefore pumping plants may not be required.

Why need planning and design?

The planning and design of irrigation systems should aim at maximizing the returns and minimizing both the initial capital outlay and the costs per unit volume of water used, thus contributing both directly and indirectly to the overall reduction of the production costs and the increase of returns. In other words, planning and design is a process of optimizing resources.

Step for design

The first step in the preliminary design phase is the **collection of basic farm data**. The data include:

❖ a topographic map showing:

• The proposed irrigated area, with contour lines

• Farm and field boundaries and water source or sources

• Power points, such as electricity lines, in relation to water source and area to be irrigated, roads and other relevant general features such as obstacles

❖ Data on water resources, quantity and quality over time, on water rights and on cost of water where applicable

❖ the climate of the area and its influence on the water requirements of the selected crops

❖ the soil characteristics and their compatibility with the crops and irrigation system proposed

❖ the types of crops intended to be grown and their compatibility with both the climate in the area, the water availability and the soils; current agricultural practices should be identified

SURVEY LOKASI

SURVEY SUMBER AIR

The next step is to **analyze the farm data** in order to determine the following preliminary design parameters:

- peak and total irrigation water requirements
- infiltration rate of soils to be irrigated
- maximum net depth of water application per irrigation
- irrigation frequency and cycle
- gross depth of water application
- preliminary system capacity

Once the preliminary design parameters are determined, the next phase is to reconcile them with the performance of the irrigation equipment and arrive at the final design. The final design steps involve:

- identification of irrigation system options with farmer participation
- preparation of system layout for the field shape and topography
- the hydraulic design and iterative adjustments
- irrigation equipment selection taking into consideration economic and financial aspects
- final irrigation system selection as well as options, taking into consideration farmers' preferences, management capabilities, labour aspects, financial capabilities and constraints

Preliminary sprinkler irrigation design steps

The preliminary design factors that need to be established are: depth of water application per irrigation, irrigation frequency, duration of irrigation per set and required system capacity (flow rate). All these design parameters are derived from the data on climate, water, soil and plant.

PT DAYA SANTOSA REKAYASA
A Complete Irrigation Solution

TERIMA KASIH