

ICID Young Professionals e-Forum (IYPeF)

**On-farm Irrigation Efficiency for Small Scale Farming**

**Background Note for Discussion**  
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**Introduction**

In general, the term efficiency is used to quantify the relative output obtainable from a given input. Referring to the use of water in irrigation, not all water taken from a source (river, well) reaches the root zone of the plants but part of the water is for example lost during transport through the canals and in the fields., The remaining part is stored in the root zone and eventually used by the plants., In other words, only a part of the water is used efficiently, and the rest of the water is wasted from the point of view of the irrigated crops.

In this note, we are concerned about two types of irrigation efficiencies. The first one is called "Conveyance efficiency" and it is defined as the net amount of water delivered to a farm gate and its mainly depends on 1) evaporation from the water surface (in open canals) 2) Deep percolation to soil layers underneath the canals (unlined canals) 3) Overflow of water quotas by other farmers., The second one is "on-farm application efficiency or field application efficiency" and generally refers to the fraction of the water volume applied to a farm or a field that is "consumed" by a crop, relative to the amount applied. Field application efficiency mainly depends on the irrigation method and the level of farmer discipline., Some indicative values of the average field application efficiency are given in Table 1. Lack of discipline may lower the values found in Table 1.

**Table 1.** Indicative average field application efficiencies.

<b>Irrigation methods</b>	<b>Field application efficiency</b>
Surface irrigation (border, furrow, basin)	60%
Sprinkler irrigation	75%
Drip irrigation	90%

BY FAW Irrigation / Water Management: Irrigation Scheduling

Finally, we can summarize the ways to improve water-use efficiency as follows:

- (1) Reduce conveyance losses by lining channels or, preferably, by using closed conduits.
- (2) Use the modern field irrigation methods (sprinkler and drip irrigation systems),
- (3) Reduce direct evaporation during irrigation by avoiding midday sprinkling. Minimize foliar interception by under-canopy, rather than by overhead sprinkling
- (4) Reduce runoff and percolation losses due to over irrigation
- (5) Reduce evaporation from bare soil by mulching and by keeping the inter-row strips dry
- (6) Reduce transpiration by weeds, keeping the inter-row strips dry and applying weed control measures where needed



- (7) Establish water user's associations for to ensure that quotas are not exceeded by increasing understandings among farmers.

### **Expected outcome**

- (1) What are the activities to be taken by YPs to raise awareness of farmers against wasting water which leads to reducing irrigation efficiency?
- (2) How irrigation planners and officers currently aim to improve the rate of water conveyance efficiency?
- (3) How you rate the field application efficiency in your agricultural land area and what appropriate means to development?
- (4) What are the ways of transferring modern technology in your area to raise the rates of On-farm efficiency? Training courses, Model Farms, etc.

### **References**

- Food and Agriculture Organization (1997). Small-scale irrigation for arid zones, Rome, Italy.
- Food and Agriculture Organization (1989) Irrigation Water Management: Irrigation Scheduling, Rome, Italy.
- Japan International Cooperation Agency (2017). Sustainable Irrigation Water Management Work Plan Project in the Republic of Iraq.

