SOCIO-ECONOMIC BENEFITS OF METEOROLOGICAL AND HYDROLOGICAL SERVICES

INVENTORY OF DECISION SUPPORT TOOLS

Irrigation Water Demand – Water Conservation

ITEM	DESCRIPTION
Sector	Water
Sub-sector	Irrigation Water Use Efficiency
Tool Name	IWD: Irrigation water demand model – is one example, other systems are also available
Tool Description	IWD is meant as a pre-processor for the water resources model WRM: it generates (daily) time series of supplementary irrigation water requirements that can be used as the demand time series of an irrigation demand node.
Weather, Climate or Water inputs	Rainfall and temperature data and water use data
Specific weather, climate, water data required	Air temperature (from which potential evaporation is estimated), the user can supply a time series (from the model TS data base, or use the interpolated values from the nearest climate station, 30 year average climate); Precipitation; time series of daily precipitation values selected by the user from the model TS data base; and Potential Evapotranspiration:
Spatial resolution	Nearest climate station – point data
Temporal resolution	Daily rainfall data; monthly temperature and evapotranspiration data
Delivery methodology	Historical data
Frequency of data requirement	Data required on a daily basis, but not in real-time
Other	Crop information; irrigation technique; soil type
Detailed Tool Description	The model estimates supplementary irrigation water requirements to maintain optimal conditions for plant growth: for that it maintains a soil moisture level between field capacity and **MAD**: Management Allowed Depletion, expressed as a percentage of field capacity (e.g., 50%). If the lower MAD threshold is being reached, supplementary irrigation water is added; How much depends on irrigation technology: for each technology, a target (expressed as % of MAD (where 100% means up to field capacity, and 0 means up to MAD level) and a maximum daily application rate in mm can be specified. The defaults are 0 % (only apply up to MAD) and unlimited (whatever amount of water is required to reach the target soil water content.) The MAD level for a crop is either constant, or can optionally be specified as a time series of 10 values, each representing 1/10 of the crowing period. Excess water from rainfall above field capacity (or maximum depth for paddy cultivation) is lost to percolation to the groundwater, or in the case of rice paddies will overflow. The (default) buffer between field capacity and MAD is the soil moisture reservoir that rainfall can replenish.
Spatial resolution	For each area, estimates demand, estimates effective rainfall and determines the difference – irrigation requirement
Temporal resolution	Daily
Delivery methodology	Data tables – time series and statistics
Frequency of provision	As required
Benefits of tool application	One of the main benefits identified is in avoiding waterlogging situations and maintaining crop quality.

	Maintenance of crop quality was also identified as a major issue, rather than water savings. Short-term forecasting works best on farms with water-on-demand, rather than farms with prior water ordering arrangements.
Possible future advances	Option for extension to real-time management of irrigation water to crop areas
Comments	
URL	http://www.ess.co.at/MANUALS/WATERWARE/webiwd.html
Others	This is only one such model/tool. There are many others available through the Internet.