

Improving Water Use for Dry Season Agriculture by Marginal and Tenant Farmers in the Eastern Gangetic Plains

TECHNICAL NOTE

Decision Support Tools and Mobile Apps



Activity 3.4 in the DSI4MTF project involves the development of interactive tools to support the understanding and knowledge of improved irrigation, water and energy management. Some prototype software tools have also been developed to assist the project staff to capture field data. This Technical Note details some of the tools, their function, intended audience and potential improvements.

Decision support tools

Mobile phones, particularly internet connected smartphones are efficient tools for sending and receiving information in the field. Simple interfaces can capture data, process it and/or instantaneously send it to cloud databases for processing and storage. Using these tools can reduce the time delay for data transfer (from the field to the office) and any potential transcription errors.

Inputs and outputs

Some of the tools (e.g. Water Level Tool) have been designed for the one way transfer of data, and are aimed at the DSI4MTF field staff to collect and send data. Other tools are quick calculators (e.g. Conversion Calculator, Orifice Discharge Tool, etc.) that will give fast feedback to a query, but don't store any data. The remaining tools are a combination of both data capture and information feedback tools. These tools are capturing information and performing calculations but are also sending the data to a cloud database to build a time series dataset. These tools allow the analysis of trends but also help users make some estimate of what can be expected in the future.

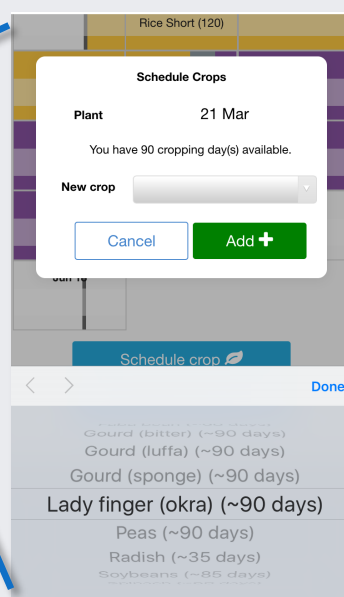
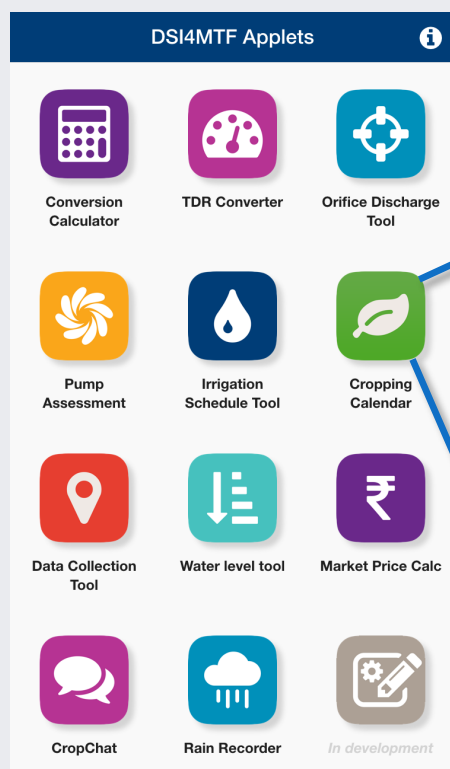


Figure 1: The DSI4MTF Applets portal contains a growing number of prototype apps. An example of an applet (above) is the Cropping Calendar, which allows farmers to investigate potential cropping rotations based on the planting of paddy and the remaining cropping days in a given year

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Icon	Tool	Function	Audience	Inputs	Outputs	Potential
	Conversion Calculator	Converts units of area, weight and currency from SI/ Australian/US units to local measurements and currencies	Primarily those working in projects that cross state or country borders	Ha, or m ² , or Bihari Bigha, or Nepali Katta, or AUD	Other units i.e. West Bengali Bigha or INR, or BDT	Could also be expanded to rates i.e. convert quintals /katta to tonnes /hat
	TDR Converter	Converts the millivolt reading from a MP406 probe into volumetric soil moisture	DSI4MTF technical staff	Calibration curve	Point readings of volumetric soil moisture	Logging ability connected to phones GPS
	Orifice Discharge Tool	Calculated the flow rate from a pump using a velocity head and the orifice equation	DSI4MTF and SRFSI technical staff	Pump outlet diameter and the discharge velocity head	Flow rate in L/s and a graphic of the flow rate curve	
	Pump Assessment Tool	Calculates the cost of pumping (Rupees per kL). Captures assessment data and compare one scenario with another	DSI4MTF and SRFSI technical staff	Pump discharge and diesel usage	Cost of pumping at a point in time	Incorporate suction and discharge pressures and calculate % efficiency
	Irrigation Schedule Tool	Uses FAO56 methodology to calculate an irrigation schedule. Also records rainfall and irrigation applied	Initially DSI Team—eventually farmers with smartphones	Crop setup (soil, plant dates, etc) irrigation & rainfall data	How much irrigation to apply and when	Automatically capture rainfall and evapotranspiration data from a weather station
	Cropping Calendar	Scenario based assessment to determine the potential cropping rotations in a given year	DSI4MTF and SRFSI technical staff and farmers with smartphone	Paddy plant date, then choice of rabi and pre-khariff crops	Calendar of potential cropping rotations	Filter cropping options based on season Exporting of scenario reports
	Data Collection Tool	GIS data collection of fields and monitoring locations (ponds, tubewells) for real time relay to cloud database	DSI4MTF Team	Field polygons & pins, daily and weekly monitoring data	Field and infrastructure maps. GIS data	Improve the user interface and further simplify
	Water Level Tool	Simple tool for capturing real time pond and tubewell levels and water quality data	DSI4MTF Team	Weekly water level measurements	Auto uploads to the GIS data tables	Link to GPS to identify ponds and shallow tubewells
	Market Price Calculator	Allows users to collect data and watch produce market prices at the nearest 4 markets	DSI4MTF and SRFSI technical staff and farmers with smartphone	Regular prices of commodities at local markets	Best price for individual commodity, best market overall	Ability to compare seasonal and annual trends in market prices with climatic conditions
	Rainfall Recorder	Simple tool for the collection of site specific rainfall	DSI4MTF and SRFSI technical staff and farmers with smartphone	Daily rain gauge readings in mm	Rainfall chart and tracking against long term average	Link to display some forecasting
	Crop Chat	Forum for discussing agronomy and irrigation technical problems between the field and the advisors	DSI4MTF and SRFSI technical staff and farmers with smartphone	Questions on and photos of crop problems or irrigation hardware	Open, searchable discussions and answers	Categorisation of forum posts Alerts and notifications

