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Importance of Real-Time Data for Effective Decision Making

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Importance of Real-Time Data for Effective Decision Making

REAL-TIME DATA

Definition: “Real-Time Data: data that is delivered immediately after collection, so that there is no loss of currency”

With real-time data it is possible to watch a situation as it is unfolding.



Importance of Real-Time Data for Effective Decision Making

In practice, the term is usually extended to cover data that is made available *after a short delay* also.

The permissible delay depends on the type of application.

(Near-real-time data is an IT term. Not defined for water resources or hydrology.)



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Importance of Real-Time Data for Effective Decision Making

**In Sri Lanka – No real-time data* yet!.
(... in the accepted sense)**

***This presentation is confined to water-related data only.**



Importance of Real-Time Data for Effective Decision Making

Main collections of Sri Lanka water data:

- **Hydrological Data**
- **Reservoir Data**



Importance of Real-Time Data for Effective Decision Making

Hydrological Data (principally):

- Manually collected hourly, but delivered the first week of following month.
- This delay was not a problem for main types of use.
- A few stations used to send data at three hourly intervals for Flood Forecasting.

(by UHF Radios, now telephone)



Importance of Real-Time Data for Effective Decision Making

Reservoir Data:

- Collected by reservoir owners – largest owners ID, MASL : smaller owners CEB, NWSDB
- Used to be posted to head office. Received on ???
- Now using telephone to convey daily data for major reservoirs



Importance of Real-Time Data for Effective Decision Making

The situation will change with the Hydro
Meteorological Information System (HMIS)

HMIS will provide a reliable, automated data network with central and backup databases and modern data analysis tools.



Importance of Real-Time Data for Effective Decision Making

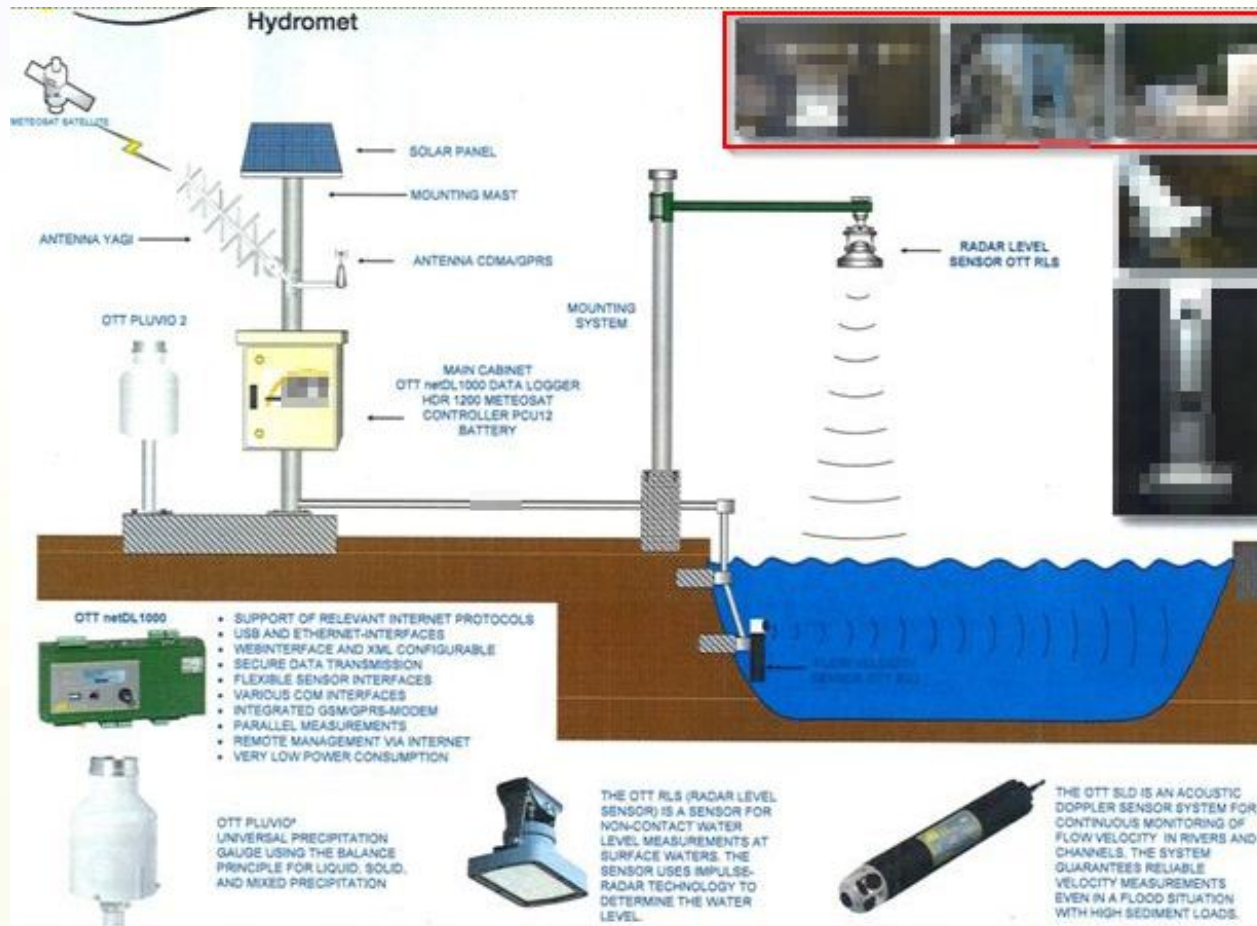
HMIS in brief-

- **122 monitoring stations, which are functionally,**
 - **73 discharge sites**
 - **109 rainfall sites**
 - **35 water level sites**
 - **19 climate data sites**



Importance of Real-Time Data for Effective Decision Making

Typical HMIS Station with Sensors.





Importance of Real-Time Data for Effective Decision Making

HMIS in brief, continued ...

- Automated measurements and logging at site
- Automated data transmission to main Data Centre via METEOSAT satellite
- Two Data Centers with modern DBMS and analytical tools
- Dissemination of data via Internet



Importance of Real-Time Data for Effective Decision Making

HMIS is implemented under Component 2 of the Dam Safety and Water Resources Planning Project (DSWRPP), a World Bank funded project. It is currently underway.

HMIS will provide Automated Real-Time Data for the first time in Sri Lanka.



Importance of Real-Time Data for Effective Decision Making

Decision Making and Real-Time Data:

Types of Decisions:

- Long term
- Short term
- Urgent



Importance of Real-Time Data for Effective Decision Making

Long-term decisions such as Planning, Investment, Infrastructure development etc.

- Dependent on reliable water data, such as mean annual flow, average precipitation, 100-year return period flood, inundation areas etc.
- However these decisions do not need real-time data.



Importance of Real-Time Data for Effective Decision Making

Short-term decisions such as making or updating Seasonal Operating Plans (SOP) etc

- Rely on the historical patterns of catchment rainfall and stream flow, command area rainfall and user patterns.
- Real-time data will be useful for the initialization of the plan and for the adjusting of the plan during the season.



Importance of Real-Time Data for Effective Decision Making

Short-term decisions such as Reservoir Operation

- Without real-time data, the Engineer has to make decisions based on his experience.
- Real-time data on the catchment rain fall, stream flow etc allows him to make a better decision balancing user demand against the storage and inflow.



Importance of Real-Time Data for Effective Decision Making

Immediate decisions such as Spill gate Operation for safety

Flood time challenge for reservoir managers:
how much water to be released to
accommodate impending flood wave?

- Too little and the dam will be imperiled.
- Too much and the next season may suffer.



Importance of Real-Time Data for Effective Decision Making

Immediate decisions such as Spill gate Operation for safety (contd...)

If he has real-time data of the catchment rainfall, upstream inflows etc, he can run a mathematical model.

With this, his decisions will be informed decisions, not a gamble depending on luck.



Importance of Real-Time Data for Effective Decision Making

Immediate decisions such as Flood Forecasting

Flood forecasts are one type of decision making, which cannot be done without real-time data.

To have an accurate and timely forecast, it is essential to have real-time data from the catchment – rainfall, discharge values of influent streams and spill data of any catchment tanks.



Importance of Real-Time Data for Effective Decision Making

Immediate decisions such as Flood Forecasting (contd ...)

Using these values in an appropriate model, it is possible to calculate the inflow hydrograph.

Note: Forecast must be accurate *and* allow sufficient lead-time. The two are often incompatible. Only with more data, can both be improved.



Importance of Real-Time Data for Effective Decision Making

In conclusion, it was seen that the availability of real-time data will have different effects.

- **Long term decisions** will not be improved.
- **Short term decisions** will be somewhat improved.
- **Urgent decisions** that affect immediately will be highly improved or become possible with real-time data.



Thank you!

