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DELFT HYDRAULICS with
HALCROW, TAHAL, CES,
ORG & JPS

VOLUME 1
HYDROLOGICAL INFORMATION SYSTEM

FIELD MANUAL - PART III
DATA NEEDS ASSESSMENT

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1 GENERAL

Purpose

An essential feature of the Hydrological Information System is that its output is **demand driven**. This means that its output responds to the hydrological data needs of the users assembled in the Hydrological Data Users Group (HDUG). Therefore, the existing and potential data users have to be interviewed to assess their hydrological data requirements (including meteorological, surface water, groundwater and water quality data) in view of their mandate/objective. To streamline the data need assessment a questionnaire has been designed. The purpose of this questionnaire is to provide in a structured manner information on:

1. The profile of the users of hydrological data
2. The current and proposed use of water systems
3. Current hydrological data availability and requirements
4. Future hydrological data requirements.

This information provides basic input for the design/review of the network, site selection, type of data collected, frequency of observation and the methods of data storage and dissemination.

Interview team

Small interview teams (IT's) are to be constituted to visit the existing and potential data user with the questionnaire. Per state the IT should include a representative of the State Surface Water Department and one of the State Groundwater Department. It is essential that the team members have thorough knowledge of the Hydrological Information System and possible outputs of the system. For important (potential) data users the Head of the Data Centre should lead the IT.

Approach

The (potential) data users are approached for an interview one by one. An appointment is made with the manager/director of the data user organisation/company for a meeting with him/her and relevant staff members, who actually use or may use the data in their day to day work.

The interview comprises two visits:

1. In the first visit the IT first explains the concept of the Hydrological Information System, its objectives and possible output and subsequently explains the contents of the questionnaire and how questions have to be interpreted. It is essential to get a proper impression of their mandate/objective, and based on that, to assess possible uses of hydrological data to improve their functioning/output: the data market should be properly explored. At the end of the visit a date has to be set for the follow up visit, which should be scheduled within one month from the first. In between the first and the follow up the (potential) data user has to complete the questionnaire.
2. In the second visit, the IT reviews with the data user the answers to the questions and checks if the questions have properly been understood and sees to it that the replies do comply with the objectives of the data user need assessment.

The results of the interviews should be thoroughly analysed, in two ways:

1. Have the results immediate effects for the data made available through the Data Centres, and
2. Do the results lead to adjustments in the approach of data users and possible alterations in the questionnaire.

2 QUESTIONNAIRE FOR HYDROLOGICAL DATA USERS

The questionnaire includes the following topics:

A. Details about the organisation

- particulars of organisation
- services provided
- personnel
- financing

B. Current water system

- use of water system
- classification of use
- quantification of use
- changes in use
- responsibility for use

C. Current hydrological data availability and uses

- Sources of data
- Standards of services

D. Data requirements

- Classification of data
- Proposed use of data
- Data parameter requirement

QUESTIONNAIRE FOR HYDROLOGICAL DATA USERS

This questionnaire is intended to collect information on hydrological data needs for the further development of the Hydrological Information System. This questionnaire serves to identify:

- A. The profile of the users of hydrological data
- B. The current and proposed use of water systems
- C. Current hydrological data availability and requirements
- D. Future hydrological data requirements

STATE/CWC/CGWB:.....

Date of interview:

INTERVIEWERS:

Name:

Designation:

INTERVIEWEE(S):

Name:

Designation:

A. DETAILS OF YOUR ORGANISATION

A1. Particulars of your organisation

i) Name of organisation.....

Address.....

.....

.....

Telephone:.....

Fax:.....

Sector: Governmental/Semi-governmental/Public Sector Undertaking/Private

(please delete as appropriate)

ii) If non-private, please specify to which ministry or local authority your organisation belongs:

iii) What are your organisation's responsibilities/obligations/mandates (legal mandates?) and objectives?

A2. Services Provided

i) Please provide details, supported by examples, of the type of services you provide:

ii) Who are your main customers/clients ?

1. Central/State Government Departments:

2. Semi-Government Organisations:

3. Municipal Corporations/Local bodies:

4. Voluntary Organisations:

5. Private Sector:

A3. Personnel (optional)

i) Please provide information on personnel employed by your organisation, in accordance with the following:

	<u>Numbers of personnel</u>			
<u>Category</u>	<u>Unskilled/ semi-skilled</u>	<u>Skilled</u>	<u>Professional (Graduate/ post graduate)</u>	<u>Total</u>
1. Administrative				
2. Technical				
TOTAL				

ii) Of your professional staff please indicate the numbers under each of the following categories:

<u>Category</u>	<u>Number of professional staff</u>
Meteorologists	
Civil Engineers	
Hydrologists	
Hydro-geologists	
Chemists	
Environmental Scientists	
Computer specialists	
Science	
Other (please specify).....	
TOTAL	

A4. *Financing (optional)*

i) What is your annual turnover?

ii) Is your organisation self-supporting? If not what is your source of revenue?

iii) Do you charge for your services?

iv) Do your charges cover all your real costs?

B CURRENT WATER SYSTEM USE

B1. Use of water system

Do you make use of a water system (not necessarily consumption only)?

- i) surface water (river, lake, creek, canal)
- ii) groundwater (spring, well, borehole)

B2. Classification of use

How do you classify your type of use (please tick where appropriate):

Classification	Please ✓
Flood control	
Domestic (domestic use, livestock watering)	
Irrigation	
Fisheries	
Forestry	
Food processing	
Industry (textiles (dyes, leather), pulp and paper, cement, petrochemical, pharmaceutical, fertiliser)	
Mining (coal, ore)	
Water transportation	
Hydroelectric power generation	
Thermal power generation	
Nuclear power generation	
Wild life and nature reserve management	
Tourism, recreation	
Other (please specify).....	

B3. Quantification of use (optional)

Please quantify the use

Amount('):

Where required('):

How much required('):

(')Please provide this information on a separate sheet (if necessary)

Timing: e.g. equally distributed around the year, peak periods, needs in low flow period

Quality: Specify the standards adopted (e.g. BIS)

Tick the important issues from the following list:

Issue	✓
Bacteriological quality	
Suspended solids	
Aesthetic items (odour, colour)	
Temperature	
Turbidity	
Salinity	
Hazardous wastes	
Acidity, corrositivity	

B4. Changes in use

Do you expect the current use to change significantly within the next 10 years? Quantify if possible.

Where required?

How much will be required?

Timing?

Quality?

B5. Responsibility for use

Are you responsible for the provision and/or discharge of water and/or the control of its water quality?

C. Current hydrological data availability and uses**C1. Sources of data**

- i) Does your organisation operate and/or own a (geo-)hydrological and/or meteorological network?

YES/NO?

- ii) If “YES” could you please provide an inventory.

- iii) Who or who else supplies your organisation with (geo-)hydrological and/or meteorological data at present? Please provide an inventory of the information needed/supplied.

- iv) How, when and with what frequency and in what form do you receive this data?

How is data received? e.g. post, courier, telephone (voice and/or modem) etc.

When is data received? e.g. on request, monthly, annually etc.

Frequency of data? e.g. daily, monthly, ad-hoc etc.

Form of data? e.g. hard copy, on disk etc.

- v) What charges are made, if any, to supply the data referred to above?

C2. Standards of service

- i) Is your organisation satisfied with the current standards of water data services?

YES/NO?

- ii) If the answer to C.2 (i) is "NO", what are your suggestions and where do you feel improvements can be made?

D Data Requirements

D1. Classification of data

How do you classify the type of data required:

- historical data¹
- real-time data²

D2. Proposed uses of data

Use the following table to specify for which purpose you need the data.

Classification	<u>Planning</u>	<u>Design</u>	<u>Management & operation</u>
Flood control			
Domestic (domestic use, livestock watering)			
Irrigation			
Fisheries			
Forestry			
Food processing			
Industry			
Mining (coal, ore)			
Water transportation			
Hydroelectric power generation			
Thermal power generation			
Nuclear power generation			
Wild life and nature reserve management			
Tourism, recreation			
other (please specify).....			

¹ Historical data is data that is collected for planning and design purposes i.e. it is past data. For example the collection of a 10 year sequence of river flow data for reservoir capacity design purposes;

² Real time data is data that is required for day to day operational purposes e.g. river levels for flood management and warning purposes.

D3. Data parameter requirements:

Please complete Table 1 indicating the type of data you require.

TABLE 1**QUESTIONNAIRE FOR HYDROLOGICAL DATA USERS - USER DATA PARAMETER REQUIREMENTS**

Data On	Type of data	Importance	Interval	Frequency	Form	Accuracy
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Meteorology	1. Rainfall					
	2. Air temperature					
	3. Air pressure					
	4. Humidity					
	5. Wind speed					
	6. Wind direction					
	7. Sunshine duration					
	8. Evaporation					
Surface water	<u>Water quantity</u>					
	1. Water level					
	2. Flow velocities					
	3. Stage-discharge data					
	4. Discharge					
	5. Sediment concentration					
	6. Water use					
	<u>Water quality</u>					
	1. Colour & odour					
	2. Dissolved oxygen					
	3. Electrical conductivity					
	4. pH					
	5. Water temperature					
	6. Solids dissolved/suspended					
	7. Turbidity					
8. Alkalinity (carbonate/bicarbonate)						
9. Chloride						
10. Sulphate						
11. Calcium						
12. Magnesium						
13. Potassium						
14. Sodium						
15. Nitrogen (ammonia, organic, nitrite, nitrate)						

Data On	Type of data	Importance	Interval	Frequency	Form	Accuracy
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Surface water	16. Phosphate					
	17. Boron					
	18. Fluoride					
	19. Iron					
	20. Manganese					
	21. Silica					
	22. Chemical Oxygen demand					
	23. Biochemical Oxygen Demand					
	24. Coliform bacteria (total, faecal)					
	25. Trace heavy metals (arsenic, cadmium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, zinc)					
	26. Cyanide Trace organics (phenols, petroleum, derivatives, detergents, pesticides)					
	27.					
	<u>Other</u>					
	1. River basin maps					
	2. Hydraulic infrastructure					
	3. Stage-discharge ratings					
4. Sediment-discharge ratings						

- Legend: (3) Importance of parameter: 0 = not required, 1 = important, 2 = indispensable/essential
 (4) Required time interval of data series e.g. hour, hour, day, week, month, annual
 (5) If data are required on regular basis indicate at what frequency e.g. receive on monthly basis
 (6) Indicate the form in which the data is required: 1 = hard copy; 2 = computer file
 (7) Specify the required accuracy of the data in absolute or relative values e.g. +/- 10 mm, +/-15%.

TABLE 1 (contd.)

QUESTIONNAIRE FOR HYDROLOGICAL DATA USERS - USER DATA PARAMETER REQUIREMENTS

Data On	Type of data	Importance	Interval	Frequency	Form	Accuracy
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Groundwater	<u>Water quantity</u>					
	1. Piezometric level					
	2. Water use					
	<u>Water quality</u>					
	1. Colour & odour					
	2. Electrical conductivity					
	3. pH					
	4. Water temperature					
	5. Solids dissolved/suspended					
	6. Alkalinity (carbonate/bicarbonate)					
	7. Chloride					
	8. Sulphate					
	9. Calcium					
	10. Magnesium					
	11. Potassium					
	12. Sodium					
	13. Nitrate					
	14. Phosphate					
	15. Boron					
	16. Fluoride					
	17. Iron					
	18. Manganese					
	19. Silica					
	20. Trace heavy metals (arsenic, cadmium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, zinc)					
	21. Cyanide					

Data On	Type of data	Importance	Interval	Frequency	Form	Accuracy
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	22. Trace organics (phenols, petroleum, derivatives, detergents, pesticides)					
	<u>Other</u>					
	1. Geo-hydrological maps					
	2. Aquifer parameters/pump test data					
	3. Observation well data					
	4. Production well data					

- Legend: (3) Importance of parameter: 0 = not required, 1 = important, 2 = indispensable/essential
 (4) Required time interval of data series e.g. hour, hour, day, week, month, annual
 (5) If data are required on regular basis indicate at what frequency e.g. receive on monthly basis
 (6) Indicate the form in which the data is required: 1 = hard copy; 2 = computer file
 (7) Specify the required accuracy of the data in absolute or relative values e.g. +/- 10 mm, +/-15%.