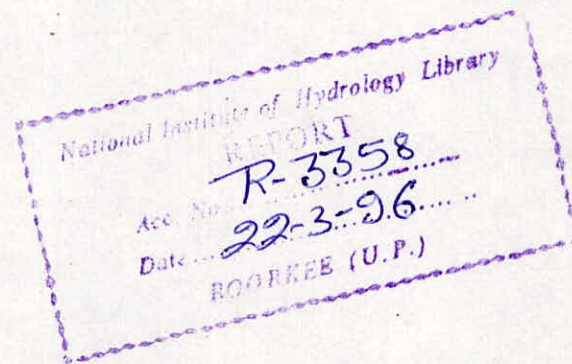


राष्ट्रीय जल विज्ञान संस्थान

रुड़की

NATIONAL INSTITUTE OF HYDROLOG
ROORKEE



वार्षिक - विवरण

(1979-80)

ANNUAL REPORT

1979-80

(द्विभाषीय)

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NATIONAL INSTITUTE OF HYDROLOGY ROORKEE

ANNUAL REPORT 1979-80

Introductory Remarks

The National Institute of Hydrology has been set up with effect from 16th December, 1978 as an autonomous Society registered under the Societies Registration Act, 1860 under the Ministry of Irrigation, Government of India with its headquarters at Roorkee, Uttar Pradesh.

The Institute is a premier National Research Organisation entrusted with carrying out systematic scientific research activities in basic theoretical and applied hydrology which has very great relevance to national planning and developmental activities in the area of water resources.

Organisation

The President of the Society is the Union Minister for Irrigation. The affairs and funds of the Society are being managed, administered, directed and controlled subject to rules, bye-laws and orders of the Society by the Governing Body with the Secretary, Department of Irrigation as its Chairman.

The other members of the Governing Body have been drawn from several other ministries and organisations including Central Water Commission, CGWB, IMD etc. The Institute is headed by a Director and he is assisted with the supporting administrative and technical staff. On the Scientific side there is an Officer of the level of Scientist 'E' (1500-2000) and on the administrative side a Chief Administrative Officer (1200-1600) and a Finance Officer (1100-1600). Other supporting staff in position in March 1980 include 1 Senior Research Assistant (550-900), 3 Research/Technical Assistant (425-800), 2 Stenographers (330-560) and 2 Lower Division Clerks (250-400). The Institute is functioning at Roorkee in the accommodation provided by UOR. The Institute will have its own building in about a year's time.

UNDP Project

The Project has been included in the Country Programme of UNDP assisted Project and the UNDP has agreed to contribute \$ 8,86,950 for establishing the Institute on which

5 years. The UNDP contribution is under three broad heads, viz.,

(i) **Consultancy** : It includes visits on a number of occasion for a total period of 12 months by the Chief Technical Advisor and 6 man-months consultancy by a number of other experts to be identified by the project. Prof. U. Maniak, Professor, Braunschweig University, West Germany has visited NIH 3 times approximately at 6 months intervals as the Chief Technical Advisor. During these visits the workplan was revised and the implementation of the project, in all respects, were followed up.

(ii) **Study tours and fellowships** : This includes a study tour for a period of 3 months each for Director and senior Scientists and training fellowships for the scientific personnel for a total period of 120 man-months. Proposals for a fellowship in the area of computer systems in 1980 and in the areas of groundwater hydrology, flood routing and watershed modelling in 1981 are under various stages of processing.

(iii) **Equipment** : UNDP provision for equipment is US \$ 4,54000. The Remote Job Entry Station with real time data logging facility will constitute a major share of the equipment provision.

Meetings of the Authorities

The First Annual General Meeting of the Society of NIH was held on 17th Feb. 1980 and in this meeting the progress and performance of the Institute was reviewed apart from other business. In addition the Governing Body of the Institute met 4 times during the year under review on 29-6-79, 20-9-79, 12-12-79 and 9-2-80. Several decisions concerning approval of work plan of the Institute, creation of posts in the Institute, procurement of equipment and provision of funds needed for the proper functioning of the Institute were taken.

The Governing Body of National Institute of Hydrology, in its Meeting held on 2-2-1979, constituted a Technical Advisory Committee for technical scrutiny of programmes of work to be taken up by the National Institute of Hydrology Society under the Chairmanship of the Chairman, Central Water Commission with seven other members drawn from various field organisations. The functions of the Technical Advisory Committee are-

- (1) to undertake Technical Scrutiny of programmes of work to be taken up by NIH;

- (2) to lay down and review terms and conditions governing fellowships, scholarships, grants-in-aid, special programmes etc., in the Institute and to sanction proposals thereof.
- (3) to consider and approve of collaborative or sponsored research projects including their terms and conditions.

The Technical Advisory Committee met on three occasions during the year under review viz., 2-5-79, 10-9-79 and 4-10-1979.

Activities

As envisaged in the UNDP Project, a revised workplan was prepared by the Director and the Chief Technical Advisor UNDP during his first visit. This was discussed in detail by a Technical Advisory Committee, and based on its recommendations the Governing Body approved a revised workplan for NIH.

The activities of National Institute of Hydrology may be classified as follow :-

(i) Research which may involve development of systematic (mostly computer oriented) procedures for hydrologic analysis and synthesis including planning to enable less experienced personnel to use the procedures satisfactorily with minimum guidance and to save time for experienced specialists; and theoretical and basic studies in hydrology for understanding the component processes and their interactions.

In particular research activities deal with :

- a. Measuring techniques, data collection and processing ;
- b. Hydrological analysis of surface and/or groundwater systems and the component processes ; and
- c. Hydrological synthesis or planning of surface water, groundwater and conjunctive utilisation.

(ii) Methods systemisation : To standardise and systemise methods for analysis and synthesis on a national basis in collaboration with National and State Government Agencies :

(iii) Documentation : To develop a proper system of documentation of research results including working papers, reports, programmers' manuals, user manuals, training documents etc.

(iv) Training : One or two training seminars of a week's duration per year on new methodologies including the application of computer programmes with respect to intensive and effective training in hydrologic analysis.

(v) Special Assistance : To provide assistance and advice for engineers/scientists in the application of procedures developed or implemented by NIH and/or in the application of other procedures for unusual problems in the field.

(vi) Planning Assistance : To develop a consultation capability so that sponsored projects can be taken up by NIH outside its regular budget for the solution of complex problems.

The following problems were identified for being taken up by National Institute of Hydrology :-

(i) Hydrologic Analysis of Streamflows in a Basin :

Streamflows vary probabilistically in space and time. This is to be analysed using statistical and time series methods including multi-variate models for annual, monthly and ten daily streamflows, flood peaks, low flows, etc. It may also be necessary to fill in missing data and generate data when required for planning purposes.

(ii) Water Balance in River Basins :

The estimation of the availability of surface and groundwater resources and their variability may be based on the analysis of the water balance of river basins including lakes, surface and groundwater areas, etc. Methodologies for analysis of water balance of surface water, soil moisture, groundwater and river basin systems for different data availabilities and purposes will be developed, tested and implemented.

(iii) Watershed Models including those for Snowfed basins and basins with limited data :

The estimation of the water resources of small basins particularly with limited data require an adequate understanding of the hydrologic cycle with particular reference to each basin and the component processes of infiltration, evapotranspiration, soil moisture, and groundwater flow. Watershed simulation models are useful for simulation of the watersheds with limited concurrent precipitation and streamflow data. These models then can be used with longer period hydrometeorological data to synthesize streamflow records for planning purposes or for estimation of floods.

(iv) Method of Operation of a System of Reservoirs taking into consideration the effect of Irrigation, Flood control and Power Generation :

Surface water resources systems including reservoirs and diversion works can meet multipurpose water requirements for irrigation, flood control, power genera

tion, etc. The economic and optimal operation of multipurpose, multireservoir systems to meet conflicting and complementary seasonally varying demands from reservoir storage and probabilistic inflows may be studied by complex reservoir simulation models. It is proposed to develop methodologies for operation of single and multipurpose operation of single or multiple reservoir systems.

(v) Evolution of Mathematical Models for Storm Precipitation for Flood Estimation :

Design of flood control systems very often require an estimation of the design storms for which each engineering structure is to be designed. The estimation of the design storm/probable maximum precipitation for large basins, and depth area duration frequency relationships for small basins are important problems to be studied in this area.

(vi) Evolution of Methodologies for Flood Estimation, Forecasting and Control:

Estimation, forecasting and control of floods involve different hydrologic methodologies including statistical approaches, time series and adaptive control models, unit hydrograph and other rainfall runoff procedures, flood estimation and routing procedures, comprehensive flood simulation models, etc. Because of the monsoon climate which causes very intensive and extensive storm precipitation in India and because of the varied physical and hydrometeorological nature of the process over different regions of India, there is an urgent need to develop, implement, test and validate suitable methodologies for estimation and routing of floods taking into account the data limitations. Methodologies for flood forecasting and flood regulation as part of the above problem are also to be studied.

(vii) Methodologies for Groundwater Estimation and Development :

Several regions of India including the Indo-Gangetic plains and the coastal plains have extensive groundwater reservoirs. The estimation of groundwater resources in these regions as well as the impact of groundwater development and interaction of groundwater with surface water require mathematical modelling of groundwater systems and the hydrologic processes taking place through aquifers. Development of methodologies in these areas including water quality aspects are very much needed.

(viii) Study of Extreme Storms and floods and their Implications in Hydrologic Synthesis :

Extremely intense storms and large floods which may be rare in a statistical sense occur repeatedly in one part of India or another. While it may not be possible to provide full protection against these extremely rare storms, it is possible to study their hydrometeorological characteristics for taking adequate measures for forecas-

ting such rare storms and for providing timely warning against hazards due to floods.

Building and Services

The National Institute of Hydrology (NIH) is to be located in an area of 6.5 acres within the University of Roorkee campus. The specific area has already been identified and agreed upon between University of Roorkee and the Government of India. Preliminary plans for the administrative building with floor area of 1400 sq.m. have been prepared earlier by the CPWD. The Governing Body has since decided that the construction of the building may be entrusted to the University of Roorkee as a deposit work. The detailed plans and specifications for this building are being finalised in consultation with the University of Roorkee. It is expected that the building may be ready by the end of 1981. Preliminary actions are being taken up for the provision of services for NIH including boundary walls, roads, lighting, substation, air-conditioning and tubewell.

Equipment

There is a provision for equipment of US \$ 454 000 under the UNDP project. For the research work to be taken by NIH it is necessary to have a Remote Job Entry Station (mini-computer) with real time data logging facility, which may be connected to the Roorkee University Regional Computer Centre. A VAX-11/780 mini-computer system has been identified for the above purpose and action to procure the same is in progress.

Since the administrative building where the mini-computer is to be finally located will not be ready in time, it is proposed to locate temporarily the mini-computer in the present premises of NIH and to shift it later to the administrative building.

Ancillary equipment available in India for use with the mini-computer system are being identified. Furthermore, equipment to be provided for research work during the remaining period of project which can be procured within India or under UNDP project are also being identified.

Accounts and Finance

The Government of India, Ministry of Irrigation provided as grant-in-aid an amount of Rs. 7.5 lacs to the Institute during the year under review. The actual expenditure for the year 1979-80 was of the order of Rs. 3.65 lacs. A provision of Rs. 19.50 lacs has been made in the budget estimate for the year 1980-81.

The audited statement of accounts for the year 1979-80 consisting of Receipts and Payments Account, Income and Expenditure Account and Balance Sheet as at 31.3.80 duly certified by the Auditors are enclosed.

Acknowledgement

In conclusion, it may be stated that whatever progress the NIH has made till now it is because of the advice, guidance and help received by the Hon' ble Minister for Irrigation, who is the President of the Society. Our thanks are due to the Chairman, Shri C.C. Patel Secretary, Ministry of Irrigation for his advice and support. We are also thankful to the members of the Governing Body and to the Vice-Chancellor, University of Roorkee for extending the co-operation and help of the University to us.

THAKUR VAIDYANATH AIYAR & Co.
CHARTERED ACCOUNTANTS
New Delhi, Calcutta, Bombay, Madras,
Patna, Kanpur and Chandigarh.

Telegrams : "AUDIT"
Telephones : 310008 (3 Lines)
Thapar House, 124, Janpath,
New Delhi-110001.

**AUDITORS REPORT TO THE MEMBERS
OF
NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE**

We have audited the attached Balance Sheet and the Income and Expenditure Account of the National Institute of Hydrology as on 31st March, 1980 and report that we have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purpose of our Audit and that in our opinion and to the best of our information and according to the explanations given to us the accounts give a true and fair view :

1. In case of the Balance Sheet, the state of affairs of the Institute as on 31st March, 1980, and
2. In case of Income and Expenditure Account of the deficit for the period ended on that date.

Sd/-
CHARTERED ACCOUNTANTS

SEAL

THAKUR VAIDYANATH AJYAR & Co.
CHARTERED ACCOUNTANTS
New Delhi, Calcutta, Bombay, Madras,
Patna, Kanpur and Chandigarh.

Telegrams : "AUDIT"
Telephones : 310008 (3 Lines)
Thapar House, 124, Janpath,
New Delhi-110001.

UTILISATION CERTIFICATE

Certified that the National Institute of Hydrology has incurred a sum of Rs. 3,57,758.66 (Rupees Three Lacs Fifty Seven Thousand Seven hundred Fifty Eight and Paise Sixty Six only) out of which Rs. 1,77,619.94 (Rupees One lac Seventy Seven Thousand Six Hundred Nineteen and paise Ninety Four only) on acquisition of fixed and other assets and Rs. 1,80,138.72 (Rupees One lac Eighty Thousand One Hundred Thirty Eight and Seventy Two Paise Only) on revenue expenditure against the Grant-in-Aid of Rs. 7,50,000 (Rupees Seven Lacs Fifty Thousand Only) given to the Director, National Institute of Hydrology, Roorkee and the same has been verified with reference to the account records maintained by the Institute and has been found to be correct.

Dated : 28th August, 1980

Sd/-

Place:- New Delhi

CHARTERED ACCOUNTANTS

SEAL

RECEIPTS & PAYMENT ACCOUNT FOR THE YEAR ENDED 31st March, 1980

| Previous Year | RECEIPTS | Amount Rs. | Previous Year's Figure | PAYMENTS | Amount Rs. |
|-------------------|---|------------|------------------------|---------------------------------|------------|
| | CASH & BANK BALANCE | | 5,711.10 | Salaries, Wages & Allowances | 89,946.50 |
| | i) Cash-in-hand | 1,000.00 | 3,733.55 | Travelling & Conveyance | 27,467.05 |
| | ii) Balance with State Bank of India in Savings Bank A/c | 11,412.17 | 1,459.16 | Printing & Stationery | 13,944.83 |
| | iii) Drafts-in-hand | 14,388.86 | 536.90 | Postage & Telegrams | 2,222.65 |
| | GRANT-IN-AID | | 100.17 | Office Expenses | 99,255.43 |
| | Received from Govt. of India Ministry of Irrigation, Dept. of Irrigation, New Delhi | 750 000.00 | — | T.A./D.A. to non-Officials | 1,859.90 |
| 100,000.00 | Interest on Savings Bank | 2,794.12 | 19,101.00 | Purchase of Furniture & Fixture | 33,919.12 |
| — | Miscellaneous Receipts | 2,850.00 | 10,038.73 | Purchase of Books & periodicals | 16,688.48 |
| — | House Rent Recoveries | 1,157.60 | — | Rent, Rates & Taxes | 815.10 |
| — | Water & Electricity Charges Recoveries | 1028.88 | — | Audit Fee & Expenses | 1,769.30 |
| | | | — | Festival Advance to Employees | 480.00 |
| | | | — | Buildings | 57,240.00 |
| | | | — | Stores & Equipment | 1,167.70 |
| | | | — | Deposit with BHEL | 1,000.00 |
| | | | — | Computer charges | 5,000.00 |
| | | | — | Hospitality Expenses | 1682.60 |
| | | | — | Grants-in-aid/Contribution | 3300.00 |
| | | | | Subsidies | |
| <u>100,000.00</u> | | | | | |

Contd.....

| Previous Year | RECEIPTS | Amount Rs | Previous Year's Figure | PAYMENTS | Amount Rs. |
|-------------------|-----------|-------------------|------------------------|--|-------------------|
| | | | 13,918 36 | Purchase of Duplicating Machine | — |
| | | | 18,600.00 | OYT Deposits | — |
| | | | | <u>CASH & BANK BALANCE</u> | |
| | | | 1000.00 | (i) Cash-in-hand | 1,000.00 |
| | | | 11,412.17 | ii) Balance with State Bank of India in Savings Bank A/c | 425,873.47 |
| | | | 14,388.86 | iii) Drafts-in-hand | — 426,873.47 |
| <u>100,000.00</u> | Total Rs. | <u>784,632.13</u> | <u>100,000.00</u> | | <u>784,632.13</u> |

T.V.A. & Co.
Chartered Accountant
New Delhi.

(SEAL) Flat No. 3, Thapar House,
124-Janpath, New Delhi-1
Dated : 28 Aug. 1980

As per our report of even date
Examined & found correct
Sd/-
Thakur Vaidyanath Aiyar
CHARTERED ACCOUNTANT

Sd/-
(D. Ramanathan)
Finance Officer
N.I.H. ROORKEE

Sd/-
(Dr. S. Ramaseshan)
Director
N.I.H. ROORKEE

THAKUR, VAIDYANATH AIYAR & CO.
Chartered Accountants

NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE
(Registered under the Societies Registration Act, 1860)

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st March, 1980

| Previous year | EXPENDITURE | AMOUNT Rs | Previous year | INCOME | AMOUNT Rs. |
|------------------|---|-----------------------|------------------|------------------------------|-----------------------|
| 10,136.60 | Salaries, Wages & Allowances | 110,760.85 | — | Interest on Bank Deposit | 2,794.12 |
| 3,733.55 | Travelling & Conveyance | 29,329.95 | — | Miscellaneous Income | 2,850.50 |
| 1,459.16 | Printing & Stationary | 13,944.83 | | Amount transferred from | |
| 536.90 | Postage & Telegrams | 2,222.65 | | Grant-in-aid account to meet | |
| 100.17 | Office Expenses | 18,473.17 | 17,466.38 | the deficit | 197,613.52 |
| 1,500.00 | Audit Fee and Expenses | 1,769.30 | | | |
| — | Stores & Equipment | 1,167.70 | | | |
| — | Computer, Charges | 5,000.00 | | | |
| — | Grant-in.aid/Contribution/ Subsidies | 3,300.00 | | | |
| — | Expenditure on WAPCOS Project | 858.00 | | | |
| — | Hospitality Expenses | 1,682.60 | | | |
| — | Advertisement Expenses | 14,752.09 | | | |
| <u>17,466.38</u> | TOTAL | Rs. 203,258.14 | <u>17,466.38</u> | TOTAL | Rs. 203,253.14 |

(SEAL) Flat No. 3, Thapar House,
124-Janpath, New Delhi-1
Dated : 28 Aug. 1980

As per our report of even date
Examined & found correct
Sd/
Thakur Vaidyanath Aiyar
CHARTERED ACCOUNTANTS

Sd/
(D. Ramanathan)
Finance Officer
N.I.H. ROORKEE

Sd/-
(Dr. S. Ramaseshan)
Director
N.I.H. ROORKEE

THAKUR, VAIDYANATH AIYAR & CO.
Chartered Accountants

NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE
(Registered under the Societies Registration Act, 1860)

BALANCE SHEET AS AT 31ST MARCH, 1980

| Previous year | LIABILITIES | Amount | Previous year | ASSETS | Amount |
|------------------|----------------------------|-------------------|---------------|---------------------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| | Grant-in-Aid | | | Fixed Assets (At Cost) | |
| ... | Balance brought forward | 20,875.53 | | Furniture & Fixtures | |
| | from previous year | | | Balance brought forward | |
| | Add : | | | from previous | |
| | Received from Government | | | year : | 19,101.00 |
| | of India, Ministry of | | | Add : | |
| | Irrigation, Department of | | | Additions during the | |
| 100,000.00 | Irrigation, New Delhi | 750,000.00 | 19,101.00 | year : | 33,919.12 |
| | | <u>770,875.53</u> | | | <u>53,020.12</u> |
| | Less : | | | Duplicating Machines | |
| | 1. Cost of acquisition | | | Balance brought forward | |
| | of fixed and other assets | | | from previous | |
| | transferred to Asset Fund | | | year : | 13,918.36 |
| 61,658.09 | Acocunt: 1,77, 619.94 | | | Add : | |
| | | | 13,918 36 | Additions during the | |
| | | | | Year : | ... |
| | 2. Transferred to Income | | | | 13,918.36 |
| | & Expenditure A/c to | | | Books & Periodicals | |
| | meet the deficit for | | | Balance brought forward | |
| | the yr: <u>1,97,613.52</u> | <u>375,233.46</u> | 395,642.07 | from previous year. | 10,038.73 |
| <u>17,466.38</u> | | | | | |
| 20,875.53 | | | | | |

| Previous year | LIABILITIES | | Amount | Previous year | ASSETS | | Amount |
|---------------|-------------|---|--------|---------------|--------|---|--------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| <u>Liabilities for Expenses</u> | | | |
|---------------------------------|--|------------|------------|
| 4,425.50 | Salaries | 14,344.30 | |
| | WAPCOS Project | 858.00 | 10,038.73 |
| 1,500.00 | Audit Fee | 1,500.00 | |
| — | Office Expenses | 1447.07 | |
| — | Water & Electricity | 1028.88 | |
| — | House Rent Recoveries | 1,157.60 | |
| — | Leave Salary, Pension etc. contribution | 10,895.55 | 31,231.40 |
| | <u>Asset Fund Account</u> | | |
| | Balance brought forward from previous year | 61,658.09 | |
| | <u>Add:</u> | | |
| 61,658.09 | Transferred from Grant-in-Aid A/c | 177,619.94 | 239,278.03 |

| | | | |
|-----------|--|-----------|-----------|
| | <u>Add :</u> | | |
| | Additions during the year. | 16,688.48 | 26,727.21 |
| | <u>Office Equipments</u> | | |
| | Balance brought forward | | |
| | <u>Add;</u> | | |
| | Additions during the year: | 16,611.11 | 16,611.11 |
| | <u>Vehicles</u> | | |
| | Balance brought forward from previous year | | |
| | <u>Add:</u> | | |
| | Additions during the year | 49,318.10 | 49,318.10 |
| | <u>Building work-in-progress</u> | | |
| | Advance to University of Roorkee 50,000.00 | | |
| | other expenses | 7,240.00 | 57,240.00 |
| | 216,834.90 | | |
| | <u>Other Assets</u> | | |
| 18,600.00 | OYT Deposits | 18,600.00 | |
| | Deposit with BHEL | 1,000.00 | |
| | Festival Advance | 480.00 | |
| | Prepaid Expenses | 2,363.13 | 22,443.13 |

| Previous year | LIABILITIES | Amount | Previous year | ASSETS | Amount |
|------------------|-------------|-------------------|------------------|----------------------------------|-------------------|
| 1 | 2 | 3 | 4 | 6 | 8 |
| | | | | <u>Cash & Bank Balances</u> | |
| | | | 1,000.00 | Cash-in-hand | 1,000.00 |
| | | | | Balance with State Bank of India | |
| | | | 11,412.17 | In Savings Bank A/c | 425,873.47 |
| | | | 14,388.86 | Drafts in hand | — |
| <u>88,459.12</u> | TOTAL | <u>666,151 50</u> | <u>88,459.12</u> | TOTAL | <u>666,151 50</u> |

NOTE:—No depreciation has been provided on fixed Assets.

(SEAL) Flat No. 3, Thapar House,
124-Janpath, New Delhi-1
Dated : 28 Aug. 1980.

As per our report of even date
Examined & found correct
Sd/
Thakur Vaidyanath Aiyar
CHARTERED ACCOUNTANTS

Sd/
(D. Ramanathan)
Finance Officer
N.I.H. ROORKEE

Sd/-
(Dr. S. Ramaseshan)
Director
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