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WATER RESOURCES: PROGRESS IN THE IMPLEMENTATION  
 OF THE MAR DEL PLATA ACTION PLAN

Financing of water resources development

Report of the Secretary-General

SUMMARY

The present report has been prepared pursuant to paragraph 7 of Economic and Social Council resolution 1983/57. After providing an order of magnitude of the needs of developing countries for funds for water resources development, the report gives information concerning the flow of resources during the last 10 years through the United Nations system, both in terms of support for technical co-operation, and through loans and credits. It also discusses briefly the level of assistance provided by other international organizations and bilateral aid programmes. There is a need to continue and increase efforts by the international community to provide assistance to developing countries; at the same time, however, a decreased dependence on external financing by developing countries is an essential condition for achievement of long-term sustainable development. The report discusses the need for taking measures to improve the planning process leading to the efficient formulation of programmes and projects, as well as the need to improve the capacity of Governments to generate internal resources and to make more efficient use of existing ones. In particular, attention should be given to the formulation and implementation of cost recovery policies, maintenance procedures and to the choice of appropriate low-cost technologies.

\* E/C.7/1987/1.

## CONTENTS

	<u>Paragraphs</u>	<u>Page</u>
INTRODUCTION .....	1 - 3	4
I. THE NEED FOR FINANCIAL RESOURCES .....	4 - 5	4
II. EXTERNAL SUPPORT TO WATER RESOURCES DEVELOPMENT AND UTILIZATION .....	6 - 61	5
A. Resource flows through the United Nations system of organizations .....	6 - 48	5
1. Support by the United Nations system through technical co-operation .....	7 - 25	5
(a) Water supply and sanitation .....	12 - 16	6
(b) Water for agriculture .....	17 - 19	11
(c) Multi-purpose development .....	20	12
(d) Water resources assessment .....	21 - 23	12
(e) Flood control .....	24	13
(f) Planning and management, and environment .....	25	13
2. Loans and credits by the United Nations system of organizations .....	26 - 48	13
(a) Irrigation and drainage .....	32 - 38	18
(b) Drinking water supply and sanitation .....	39 - 43	20
(c) Hydropower .....	44 - 46	21
(d) Inland waterways .....	47	22
(e) Multi-purpose development .....	48	22
B. Resource flows through other external support organizations .....	49 - 53	22
C. Suggestions for approaches at the international level .	54 - 61	23
III. THE ROLE OF GOVERNMENTS .....	62 - 76	24

CONTENTS (continued)

	<u>Page</u>
<u>Tables</u>	
1. United Nations system: Disbursements in the form of technical co-operation for water-related projects, 1973-1985 .....	7
2. United Nations system: Relative share by region and by sector on disbursements on technical co-operation, 1973-1985 .....	8
3. Growth rates and percentage of total financing by sector and by region, 1973-1985 .....	9
4. United Nations system: Disbursements on loans and credits for water-related projects, 1976-1985 .....	15
5. United Nations system: Relative share by region and by sector on disbursements on loans, 1976-1985 .....	16
6. Growth rates and percentage of total yearly disbursements by sector and by region, 1976-1985 .....	17

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## INTRODUCTION

1. The Economic and Social Council, in paragraph 7 of its resolution 1983/57, requested the Secretary-General, in consultation with the organizations concerned, "to compile information on the activities of bilateral aid programmes and international organizations and on present capacities and the terms and conditions under which they provide finances for water resources development, with a view to examining possible measures to increase the flow of resources and to improve the terms and conditions, and to disseminating relevant information to countries and international organizations, and to report thereon to the Committee on Natural Resources at its tenth session".
2. The present report first provides an order of magnitude of the needs of developing countries for funds for water resources development. It then covers resource flows for water resources development during the last 10 years through the United Nations system, both in terms of support for technical co-operation and through loans and credits, and assistance provided by other international and regional organizations and bilateral aid programmes. It makes suggestions for approaches to be used at the international level for assisting Governments in generating greater flows of financial resources. Finally it comments on the role of Governments of developing countries in increasing the flow of both internal and external financial resources.
3. Information was collected on disbursements for technical co-operation and on expenditures from loans and credits by the United Nations system of organizations, as well as resources provided by other international and regional organizational and bilateral aid programmes. Further information was provided by the organizations concerned and was also drawn from the Catalogue of External Support of the World Health Organization (WHO) in the context of the International Drinking Water Supply and Sanitation Decade. 1/

### I. THE NEED FOR FINANCIAL RESOURCES

4. The current levels of financial resources available for water resources development and utilization need to be evaluated against estimated needs on the one hand, and the extent to which developing countries are dependent upon external resources on the other. It will be recalled that at the time of the United Nations Water Conference in 1977, it had been estimated that as far as water resources assessment was concerned, some \$600 million in annual disbursements (in 1980 prices) would be required for developing countries to complete the assessment of their water resources by the end of the century. However, given the deterioration of services that has occurred in many countries, it is likely that higher annual disbursements will be required to achieve this end. As far as drinking water supply and sanitation is concerned, the World Bank in 1980 estimated that the annual level of investment required to achieve the goals of the Decade would be somewhere between \$40 and \$80 billion depending on the type and levels of coverage and on the choice of technologies. Document E/C.7/1987/4, before the Committee, which provides a general perspective of the progress in coverage that is likely to

be achieved by the end of the Decade, shows that considerable gaps will remain with regard to service coverage especially in peri-urban and rural areas. As far as irrigation and drainage is concerned, estimates at the time of the Water Conference put annual investment requirements for new and improved irrigation and drainage between 1975 and 1990 at \$7.5 billion. Later, in a report entitled Agriculture: Towards 2000, the Food and Agriculture Organization of the United Nations (FAO) has upgraded these estimates to range between \$13.5 to \$16.7 billion per year. 2/

5. The evidence suggests that external assistance plays a much larger role than was assumed at the time of the Water Conference in financing water resources projects. Information collected by WHO in the context of the monitoring of the International Drinking Water Supply and Sanitation Decade shows a high dependence on external financing in that sector. Out of 62 countries for which information is available, 47 per cent have reported that external financing constitutes over 60 per cent of total funding for drinking water supply and sanitation. There is reason to believe that the situation is the same regarding other aspects of water resources development and utilization.

## II. EXTERNAL SUPPORT TO WATER RESOURCES DEVELOPMENT AND UTILIZATION

### A. Resource flows through the United Nations system of organizations

6. Assistance by the United Nations system of organizations takes place either in the form of technical co-operation activities, including the financing of local labour through payments in kind, or through loans and credits. Information has been gathered with regard to yearly disbursements under both these categories.

#### 1. Support by the United Nations system through technical co-operation

7. Information concerning disbursements for technical co-operation activities for water resources development was collected mainly from the United Nations Development Programme (UNDP), the Capital Development Fund, the World Food Programme and the United Nations Children's Fund (UNICEF). The figures presented below therefore provide an order of magnitude of disbursements since it was not always possible to isolate the cost of water components in multi-purpose projects.

8. In order to obtain a better sense of the flow of financial resources into various aspects of water resources development and utilization, projects were classified into the following 10 categories: assessment, planning, environment, drinking water supply and sanitation, agriculture, hydropower, waterways, multi-purpose development, flood control and non-conventional uses. These categories are far from being mutually exclusive and it is often difficult to determine to which of them a given project belongs. Disbursements were also disaggregated on a regional basis. The African region was further subdivided into Africa north and south of the Sahara.

9. Table 1 shows the estimated disbursements by the United Nations system in water resources-related projects from 1973 to 1985. Table 2 provides a regional breakdown of total disbursements, by each category. The first column for each region shows the relative share of each category out of total disbursements for the region, while the second column shows, for each category, its relative regional share out of total disbursements for all countries. Table 3 shows the growth rates for the various sources of financing, as well as the percentage of the total that they represent for each region and sector of activity.

10. In spite of the severe world economic problems of the early 1980s, overall disbursements for water-related projects underwent a significant increase during this period, in particular between 1978 and 1983. In fact, a slow-down became evident only in 1983. UNDP funding, which constituted 91 per cent of the total in 1973, decreased to 43 per cent of the total by 1985. By contrast, funding by UNICEF increased from 8.8 per cent of total financing in 1973 to 22.9 per cent in 1985. Disbursements by the Capital Development Fund increased from 0.7 per cent in 1974 to 4.9 per cent in 1985. The relative share of disbursements in dollar equivalent by the World Food Programme has increased from 9 to 26 per cent.

11. Approximately 80 per cent of total funding over the last 13 years has been channelled to Africa and to Asia and the Pacific. In the case of the African region, the bulk of the funding has been directed to countries south of the Sahara. Least developed countries have received about 33.5 per cent of total disbursements. There has been over the years a relative shift in regional shares towards Africa and Asia and the Pacific, and to a lesser degree towards Western Asia. The shift is most evident in the case of the least developed countries. Disbursements on projects dealing with water resources assessment, drinking water supply and sanitation, and with the use of water for agriculture constitute about 82 per cent of the total. Projects dealing with planning and multi-purpose development account for another 10.3 per cent of the total.

(a) Water supply and sanitation

12. The most important evolution in the financing of water-related projects has taken place in the case of drinking water supply and sanitation. Disbursements for projects in this sector amounted to 21 per cent of total disbursements in 1973. By 1983 the sectors' share had increased to 57.2 per cent, but decreased to 42.2 per cent in 1985. The average annual growth rate from 1973 to 1983, which amounted to 27.8 per cent, was followed by a sharp decrease in funding from 1983 to 1985.

13. Overall funding for this sector has been strongly influenced by UNICEF's increased involvement. Disbursements by UNICEF between 1973 and 1979 increased at the rate of 48.4 per cent; a second period of slower growth, at a rate of 6.6 per cent took place between 1979 and 1983, and was followed by a period of sharp decline between 1983 and 1985 at an average rate of 21 per cent per year.

Table 1. United Nations system: Disbursements in the form of technical co-operation for water-related projects, 1973-1985

(In millions of US dollars )

Sector	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Total	Percentage of total
Assessment	4.969	4.914	5.913	6.013	7.386	8.336	8.999	10.125	9.560	9.928	8.869	10.718	12.539	108.268	8.12
Planning	1.302	1.602	3.353	2.336	2.342	3.723	3.399	4.140	6.258	8.600	9.903	8.191	16.137	71.285	5.35
Environment	1.547	1.924	3.213	3.239	2.106	1.256	0.845	1.920	2.091	1.914	0.762	0.721	0.858	22.396	1.68
DWS&S	7.693	13.834	20.506	23.204	30.320	29.903	66.346	68.799	69.652	82.929	104.462	100.782	84.462	706.892	53.03
Agriculture	11.097	9.045	11.206	14.505	12.016	11.029	20.496	23.384	31.542	32.936	39.093	44.251	58.938	319.541	23.97
Hydropower	0.456	0.831	1.862	1.666	1.286	1.685	3.175	2.541	1.766	2.952	1.779	1.026	0.920	21.946	1.65
Waterways	0.255	0.478	0.322	0.437	0.503	0.624	0.360	1.033	0.379	0.491	0.149	0.032	0.046	5.111	0.38
Multi-purpose	3.643	3.990	3.189	3.331	2.482	4.728	4.650	4.939	4.217	5.729	8.370	7.957	8.279	65.503	4.91
Flood control	0.692	0.806	0.406	0.265	0.328	0.847	0.714	0.603	0.635	2.095	1.232	1.450	1.915	11.989	0.90
Non-conventional	0.061	0.010	0.007	0.000	0.000	0.000	0.000	0.000	0.047	0.017	0.006	0.021	0.017	0.186	0.01
Total	31.716	37.434	49.977	54.995	58.770	62.131	108.984	117.484	126.147	151.591	174.625	175.150	184.111	1,333.117	100.00

Table 2. United Nations system: Relative share by region and by sector on disbursements on technical co-operation, 1973-1985

(Percentages)

Sector	% of Total	Africa N.E.		Africa S.E.		Asia-Pac.		Europe		L. America		West. Asia		Israel		Interregional		Global		LDCs		
		% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of country	% of sect.	% of intral	% of sect.	% of global	% of sect.	% of LDCs	% of sect.	
Assessment	8.12	2.59	2.24	11.30	44.86	6.44	32.35	10.41	2.46	14.13	16.00	2.62	2.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.87	24.10
Planning	5.35	6.25	8.22	4.64	27.95	3.51	26.81	2.96	1.06	16.66	28.64	5.19	6.29	0.00	0.00	0.58	0.11	8.18	0.84	4.76	29.80	
Environment	1.68	3.58	14.99	0.32	0.25	1.17	28.41	20.80	23.72	2.86	15.64	2.87	11.07	0.00	0.00	0.00	0.00	0.00	0.00	0.88	17.60	
DWS&S	50.03	21.82	2.89	58.22	35.40	57.89	44.54	18.04	0.65	31.81	5.51	59.78	7.31	0.00	0.00	87.88	2.96	70.05	0.73	65.06	41.10	
Agriculture	23.97	65.36	19.16	19.91	26.78	19.60	33.36	31.88	2.55	22.67	8.70	29.31	7.93	0.00	0.00	10.94	0.82	21.77	0.50	18.22	25.40	
Hydropower	1.65	0.00	0.00	0.97	19.02	2.19	54.32	0.43	0.50	4.69	26.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.68	54.60	
Inland waterways	0.38	0.00	0.00	0.14	11.41	0.16	11.41	1.06	5.32	2.76	66.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Multi-purpose	4.91	0.39	0.56	3.81	24.97	7.50	62.32	14.37	5.60	3.41	6.39	0.00	0.00	0.00	0.00	0.47	0.17	0.00	0.00	1.56	10.60	
Flood control	0.90	0.00	0.00	0.68	24.38	1.53	69.36	0.04	0.09	0.41	4.24	0.23	1.67	0.00	0.00	0.13	0.27	0.00	0.00	0.97	36.00	
Non-conventional	0.01	0.00	0.00	0.01	30.84	0.00	0.00	0.00	0.00	0.08	50.00	0.00	0.00	100.00	19.16	0.00	0.00	0.00	0.00	0.00	0.00	
Total	100.00		7.03		32.34		40.80		1.92		9.19		6.49		0.003		1.79		0.55		33.50	



Table 3. Growth rates and percentage of total financing by sector and regions, a/ 1973-1985

Sector/Organization	Dev. countries		Africa N.Sahara		Africa S.Sahara		Asia-Pacific		Europe		L.America-Cst.		West. Asia		LDCs	
	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate
<b>Assessment</b>																
Total	100.0	7.6	100.0		100.0	9.8	100.0	13.5	100.0	-2.0	100.0	-1.5	100.0	25.4	100.0	7.1
UNDP	99.9	7.6	100.0		100.0	9.8	99.8	13.5	100.0	-2.0	100.0	-1.5	100.0	25.4	100.0	7.1
<b>Planning</b>																
Total	100.0	20.2	100.0	21.6 b/	100.0	19.5	100.0	26.2	100.0	-	100.0	13.6	100.0	-	100.0	22.0
UNDP	99.2	20.3	100.0	21.6 b/	99.3	19.2	99.5	26.1	100.0	c/	100.0	13.6	100.0	c/	100.0	22.0
<b>Environment</b>																
Total	100.0	-8.1	100.0	-8.67	100.0	-	100.0	-8	100.0	-13.0	100.0	c/	100.0	28.4	100.0	9.1
UNDP	100.0	-8.1	100.0	-8.7	100.0	-	100.0	-8	100.0	-13.0	100.0	c/	100.0	28.4	100.0	9.1
<b>DMS&amp;S</b>																
Total	100.0	22.7	100.0	16.5	100.0	28.6	100.0	19.3	100.0	-	100.0	17.8	100.0	23.8	100.0	26.2
UNDP	24.0	15.0	26.4	-7.1	32.1	16.8	12.5	14.2	98.5	c/	17.6	1.8	13.2	1.8	22.6	22.0
CDP	6.5	45.5 d/	-	-	12.0	40.1 d/	1.5	22.5 e/	-	-	8.7	-6.3 e/	14.8	26.9 f/	15.1	43.8 d/
UNICEF	64.5	25.3	66.0	57.3	51.5	48.3	82.6	18.5	1.5	b/	42.5	12.4	72.0	51.6	59.3	48.3
WFP	5.0	21.4 a/	7.5	-	4.5	-2.1 h/	3.4	136.2 i/	-	-	31.2	44.3 a/	-	-	3.0	-10.9 a/
<b>Agriculture</b>																
Total	100.0	16.5	100.0	28.7	100.0	13.1	100.0	26.8	100.0	4.9	100.0	12.2	100.0	-9.5	100.0	19.3
UNDP	48.2	3.3	8.2	-22.1	69.4	5.5	41.5	9.8	58.3	1.6	61.4	2.6	75.0	-15.1	73.1	13.5
CDP	4.9	54.5 b/	-	-	10.1	82.5 a/	5.2	18.7 i/	-	-	4.8	84.4 i/	-	-	13.0	96.6 a/
WFP	44.8	39.2 g/	90.7	12.4 i/	15.5	50.8 i/	53.0	84.1 f/	38.3	c/	31.4	77.3 g/	22.4	-15.9 g/	13.9	65.7 g/
<b>Hydropower</b>																
Total	100.0	4.4	-	-	100.0	-	100.0	10.6	100.0	-	100.0	-2.8	-	-	100.0	15.5 b/
UNDP	87.8	-1.2	-	-	78.9	-	84.9	6.5	100.0	-	100.0	-2.84	-	-	92.7	2.39 h/
WFP	12.2	-	-	-	21.1	-	15.1	-	-	-	-	-	-	-	7.3	112.9 g/
<b>Multi-purpose</b>																
Total	100.0	8.6	100.0	-	100.0	10.4	100.0	11.4	100.0	-5.1	100.0	-	-	-	100.0	76.8
UNDP	100.0	8.6	100.0	-	100.0	10.4	100.0	11.4	100.0	-5.1	100.0	-	-	-	100.0	76.8
<b>Flood control</b>																
Total	100.0	12.0	-	-	100.0	-	100.0	28.1	100.0	-	100.0	-	100.0	-	100.0	102.3 j/
UNDP	89.3	8.8	-	-	61.0	-	98.4	28.1	100.0	-	100.0	-	100.0	-	71.9	80.2 j/
CDP	10.1	-	-	-	36.8	-	1.6	-	-	-	-	-	-	-	28.1	h/
<b>Total disbursements</b>																
Total	100.0	16.9	100.0	19.3	100.0	19.0	100.0	19.1	100.0	-5.5	100.0	8.2	100.0	10.0	100.0	51.1
UNDP	46.9	8.8	24.0	-3.94	53.9	10.6	37.5	12.2	86.4	-7.25	64.9	2.3	40.8	-1.8	44.3	16.7
CDP	4.7	48.2 b/	-	-	9.2	45.0 d/	1.9	48.5 j/	-	-	3.9	89.7 i/	8.9	-26.9 f/	12.5	49.2 d/
UNICEF	34.2	25.5	14.4	57.3	30.0	48.3	47.8	18.5	0.3	c/	13.5	12.4	43.0	51.4	38.6	48.3
WFP	13.6	33.2 a/	60.1	12.3 i/	5.9	17.8 a/	12.7	90.7 f/	12.2	c/	17.2	43.5 a/	6.6	-15.9 a/	4.7	10.6 a/

(Footnotes on following page)

(Footnotes to table 3)

- 
- a/ Growth rates computed through the regression line  $\log y = a + bx$ .
- b/ For the period 1974 to 1985.
- c/ No disbursements for the last year or two.
- d/ For the period 1978 to 1985.
- e/ For the period 1981 to 1985.
- f/ For the period 1977 to 1985.
- g/ For the period 1976 to 1985.
- h/ Including an annual rate of decline of -19.9 between 1976 and 1982, followed by a growth rate of 63.7 from 1982 to 1985.
- i/ For the period 1979 to 1985.
- j/ For the period 1978 to 1985.
- k/ Disbursements shown only for 1984 and 1985.

14. The most important growth in disbursements has taken place in Africa south of the Sahara, where yearly disbursements from the various sources grew steadily between 1973 and 1983, and then decreased. From 1983 to 1985, during the first period, UNICEF's disbursements to that region increased at an average annual rate of 61.2 per cent which, together with Africa north of the Sahara, were the highest of any region. Decreases in UNICEF disbursements over the last three years were offset to some extent by UNDP funding. In Africa north of the Sahara overall disbursements for the whole period under consideration increased steadily at an average annual rate of 16.5 per cent.

15. In the case of Asia and the Pacific, total disbursements increased rapidly between 1973 and 1979, but have decreased at an annual rate of 3.7 per cent from then to 1985. This pattern is strongly influenced by UNICEF's disbursements which increased at an annual rate of 41 per cent in the first period, and then decreased at an average annual rate of 10.1 per cent. In Latin America disbursements increased at an average annual rate of 17.8 per cent, mostly because of increases in UNICEF and World Food Programme support. The pattern of disbursements for the least developed countries as a whole, where disbursements increased at an annual rate of 32.8 per cent between 1973 and 1983, were also influenced by UNICEF disbursements, with decreases at the end somewhat offset by other sources of funding.

16. Together with UNDP's moderate but steady growth in disbursements, sufficient to stay ahead of inflation, other sources of financing, most particularly UNICEF, have played a most significant role in bringing about these gains. Their continued involvement will remain essential if the system is to continue to increase, or at least maintain, its existing capacity to assist developing countries in this sector. Not only have efforts been focused on the low-income countries and on the improvement of services in rural areas, but also in the development of low-cost reliable technology, and on improving operation and maintenance procedures, particularly in these rural areas.

(b) Water for agriculture

17. Increases in assistance for this sector have not been as impressive as for drinking water supply and sanitation. Funding from the various sources increased at an annual average rate of 16.5 per cent from 1973 to 1985. The most significant factor in this picture stems from disbursements from the World Food Programme which increased at an annual rate of 39.2 per cent since 1976.

18. The highest overall growth in disbursements on a regional basis took place in Africa north of the Sahara, where the average annual rate of increase amounted to 28.7 per cent, in spite of a yearly decrease of 22.1 per cent in UNDP financing. Disbursements for Asia and the Pacific increased at the rate of 26.8 per cent per annum, including increases in UNDP financing at a rate of 9.8 per cent. Increases for Africa south of the Sahara were smaller. It is hoped, however, that ongoing efforts by international organizations including efforts to increase the role of small-scale farming will improve the situation in coming years. In the case of the least developed countries, disbursements increased at an annual average rate of 19.3 per cent, including an increase of UNDP funding at a rate of

13.5 per cent. Average annual increases of 12.2 per cent for Latin America and the Caribbean were due to funding increases by the World Food Programme and the Capital Development Fund.

19. In the case of agriculture, including irrigation, development is dependent on a number of complex factors, including international prices of export crops, as well as food production policies which sometimes are at variance with each other. The effective demand for external funding is heavily dependent on such factors, as well as on the ability to produce well formulated projects which take into account the need for adequate organizational structures at the farm level, and the need for human resources development.

(c) Multi-purpose development

20. In Asia and the Pacific and Africa south of the Sahara, some growth in disbursements in real terms seems to have taken place. Disbursements for multi-purpose projects also increased quite significantly in the case of least developed countries. In most other developing countries, however, little attention seems to have been paid to the financing of multi-purpose projects. It has often been observed that, as a general rule, the development of water resources tends to be too specifically project-oriented without adequate links to broader economic development needs. Greater linkages between economic development needs and plans and the development potential of ground water and river basins would undoubtedly lead to increased demands for integrated basin projects.

(d) Water resources assessment

21. It would appear that concurrent with the curtailment of national funding for water resources assessment that has taken place in many developing countries coinciding with the recent recession, some Governments may have assigned less importance to this type of project within their allocations for UNDP funding, relative to other economic development projects. Overall growth in disbursements for water resources assessment projects from 1973 to 1985 amounted to 7.6 per cent per annum which may not have been enough to keep up with the rate of inflation. The growth rate in current dollars between 1973 and 1980 averaged 11.6 per cent per annum. From 1980 to 1983 disbursements decreased at a yearly average rate of 3.5 per cent.

22. Yearly disbursements for Africa south of the Sahara, which accounted for 44.9 per cent of expenditures in this sector, show an annual growth rate of 9.8 per cent over the whole period, which at best, is barely sufficient to compensate for increases in cost. The average growth rate of 13.5 per cent for Asia and the Pacific region (32.4 per cent of disbursements in the sector), is explained by a sharp rise in disbursements up to the year 1980 followed by a period of stagnation lasting until 1984. In the case of Latin America and the Caribbean (16 per cent of the total), disbursements actually decreased at an annual rate of 1.5 per cent. Only the Western Asia region, which accounted for 2.1 per cent of total disbursements for the sector, showed significant increases amounting to

25.5 per cent per annum between 1973 and 1985. For least developed countries as a group a growth rate of 18.7 per cent between 1973 and 1978 was transformed into a negative rate of 2.1 per cent between 1978 and 1985.

23. On the whole, therefore, assistance to developing countries in this area of activity has not fared well. The levels of assistance received by developing countries have been far below the investment levels needed in accordance with the estimates prepared at the time of the Water Conference.

(e) Flood control

24. Projects dealing with flood control constitute a small component of total disbursements, the bulk of which are financed through UNDP projects. Of total disbursements in this field, 76.4 per cent have been in Asia and the Pacific, where they have grown at an annual rate of 28.1 per cent between 1973 and 1985. Disbursements on flood control projects in the region peaked in 1982, after which time there has been a significant decrease.

(f) Planning and management, and environment

25. Although disbursements for projects dealing exclusively with water resources planning, management, administration and legislation constitute a relatively small percentage of the total, their rate of growth (20.2 per cent), particularly in the cases of Africa, Asia and the Pacific, and of the least developed countries, is worth noting. In addition, it is also felt that these are underestimated, as a large number of projects dealing with other aspects of water resources inevitably include a component which concerns itself with one or several issues under this classification. By contrast, disbursements on projects dealing with water pollution control have shown a sharp decline, with the exception of the Western Asia region and of the least developed countries. These figures do not necessarily suggest a decline in the emphasis given to water quality control. It may well be that water quality considerations are increasingly being integrated into other types of projects such as those dealing with industrial processes, and that disbursements are included under them.

2. Loans and credits by the United Nations system of organizations

26. Loans and credits by the United Nations system of organizations are provided by: the World Bank, in the form of World Bank loans and International Development Association (IDA) credits; and the International Fund for Agricultural Development (IFAD) in the form of loans. World Bank loans are repayable over a period of 20 years with a grace period of five years. Interest rates are established quarterly at one half per cent above the cost of funds to the Bank. Interest rates charged by the Bank from 1975 to 1985, have fluctuated from 8.0 per cent in early 1975, down to 7.0 in the first quarter of 1979, and to a high of 11.6 per cent between late 1981 to mid-1982. IDA credits have a 50-year maturity period with 10 years grace, and a service charge of 0.75 per cent per year on the disbursement portion of the credit. IFAD loans on highly concessional terms

carry a service charge of 1 per cent per year, and a maturity period of 50 years, including a grace period of five years. Loans on intermediate terms carry an interest rate of 4 per cent, and a maturity period of 20 years, including a grace period of five years. Loans on ordinary terms are charged an interest rate of 8 per cent, with a maturity period of 15 to 18 years, including a grace period of 3 years. Of the 86 loans reported by IFAD as dealing with water resources, 60 were of a highly concessional nature, 21 were intermediate, and 5 were ordinary loans. Table 5 below shows the regional distribution of loans under these three conditions.

27. In the case of World Bank loans and IDA credits, information was collected with regard to disbursements on projects dealing with irrigation, drinking water supply and sanitation, hydropower development, and inland waterways. To some extent these figures underestimate disbursements, in that they do not include disbursements for the water component of projects dealing with other subjects, such as urban development, where this component could not be identified. In the case of IFAD, information was provided on loans for irrigation and rural water supply projects.

28. Table 4 shows yearly disbursements for World Bank loans, IDA credits, and IFAD loans for water-related projects in developing countries between 1976 and 1985. For the 10-year period under consideration, disbursements from World Bank loans amounted to 69.5 per cent of total disbursements from loans and credits. IDA provided 28.8 per cent, and IFAD 1.7 per cent; the latter having grown from less than 1 per cent at its inception in 1979, to 3.1 per cent in 1985. Table 5 provides a regional break-down of shares of total disbursements and for disbursements for each category. Table 6 shows the relative share of each source of finance as well as growth rates by sector and region.

29. Overall disbursements on loans and credits for developing countries for water-related projects grew at an average annual rate of 16.6 per cent. Rates of increase were highest for IFAD since its inception in 1979, and for IDA credits. The share of World Bank loans, which amounted to 72 per cent of disbursements in 1976, decreased to 63.1 per cent by 1985. These overall increases in funding are not uniform in all regions. The highest rate was registered in Asia and the Pacific, followed by Europe, Latin America and the Caribbean, and Africa north of the Sahara. The average annual rate of increase for disbursements in Africa south of the Sahara, and for Western Asia, were not sufficient to compensate for losses in purchasing power. Disbursements for the least developed countries increased at an average annual rate of 12.6 per cent.

30. As a net effect of these growth patterns there has been a trend towards an increasing concentration of disbursements in a few regions, and in particular in Asia and the Pacific, which accounted for 44.4 per cent of the total in 1985. This shift was accompanied by an increase in the proportion of World Bank loans and IDA credits going to that region. The share going to Latin America and the Caribbean decreased from 1976 to 1979 and then began to increase again through 1985. The share of World Bank loans to that region followed the same pattern, while the region's share of IDA credits declined steadily through 1985. The percentage going to Europe declined throughout the period, with IDA credits ceasing altogether by 1981. The relative share for Africa south of the Sahara decreased from 1976 to 1985, following the same trend as its share of World Bank loans. The share of IDA

Table 4. United Nations system: Disbursements on loans and credits for water-related projects, 1976-1985

(In thousands of United States dollars)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	TOTAL	Per cent of total
<u>Agriculture</u>												
World Bank	92 700	151 260	154 450	282 220	295 100	414 600	560 370	482 770	587 010	494 900	3 515 380	58.7
IDA	111 950	105 400	86 820	152 330	216 610	234 400	255 530	334 610	373 440	427 520	2 298 610	38.4
IFAD	-	-	-	1 443	10 393	18 343	23 849	30 475	40 280	48 311	173 093	2.9
Total	204 650	256 660	241 270	435 993	522 103	667 343	839 749	847 855	1 000 730	970 731	5 987 083	54.6
<u>Hydropower</u>												
World Bank	167 670	143 720	159 650	134 250	162 460	115 790	138 370	164 360	170 220	184 410	1 540 900	91.4
IDA	6 440	2 640	4 450	8 530	6 670	30 750	12 800	18 190	22 230	31 900	144 600	8.6
Total	174 110	146 360	164 100	142 780	169 130	146 540	151 170	182 550	192 450	216 310	1 685 500	15.4
<u>Waterways</u>												
World Bank	0	0	0	0	0	73 890	26 120	0	0	0	100 010	71.7
IDA	4 410	13 710	2 720	1 530	1 720	390	1 040	8 100	4 810	1 070	39 500	28.3
Total	4 410	13 710	2 720	1 530	1 720	74 280	27 160	8 100	4 810	1 070	139 510	1.3
<u>DWS&amp;S</u>												
World Bank	103 210	143 780	133 650	153 520	204 400	200 420	320 990	341 800	427 290	425 230	2 454 290	78.1
IDA	18 340	26 420	37 390	57 900	61 340	70 280	68 230	100 760	104 940	129 380	674 980	21.4
IFAD	-	-	-	-	35	489	1 472	3 294	3 622	6 084	14 997	0.5
Total	121 550	170 200	171 040	211 420	265 775	271 189	390 692	445 854	535 852	560 694	3 144 267	28.7
<u>Total developing countries</u>												
World Bank	363 580	438 760	447 750	569 990	661 960	804 700	1 045 850	988 930	1 184 520	1 104 540	7 610 580	69.5
IDA	141 140	148 170	131 380	220 290	286 340	335 820	337 600	461 660	505 420	589 870	3 157 690	28.8
IFAD	-	-	-	1 443	10 428	18 832	25 320	33 769	43 902	54 395	188 090	1.7
Total	504 720	586 930	579 130	791 723	958 728	1 159 352	1 408 770	1 484 359	1 733 842	1 748 805	10 956 360	100.0

Table 5. United Nations system: Relative share by region and by sector on disbursements on loans, 1976-1985

(In percentages)

Sector	Africa N.S.		Africa S.S.		Asia & Pac.		Europe		L. America		West. Asia		Israel		LDCs		
	% of total	% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of reg.	% of sect.	% of country	% of sect.	% of LDCs	% of sect.
<b>Agriculture</b>																	
World Bank	32.1	27.5	3.6	6.2	1.0	35.1	26.9	61.8	14.5	23.0	10.9	31.8	1.8	--	--	11.8	0.2
IDA	21.0	18.0	2.4	29.8	4.9	38.4	29.4	2.4	0.6	0.5	0.3	16.9	0.9	--	--	57.1	7.4
IFAD	1.5	0.4	a/	1.2	0.02	2.4	a/	0.4	0.1	0.4	0.1	1.6	0.1	--	--	3.4	0.4
Total	54.6	45.9	6.1	37.3	6.1	76.6	58.7	64.2	15.1	23.9	11.3	50.3	2.8	--	--	61.5	8.0
<b>Hydropower</b>																	
World Bank	14.1	1.0	4.6	14.9	8.7	3.1	8.4	12.3	10.3	35.3	59.5	--	--	--	--	2.2	1.0
IDA	1.3	--	--	6.4	3.7	1.2	3.4	--	--	0.9	1.5	--	--	--	--	3.0	1.4
Total	15.4	1.0	4.6	21.3	12.4	4.3	11.8	12.3	10.3	36.2	61.1	--	--	--	--	5.2	2.4
<b>Waterways</b>																	
World Bank	0.9	--	--	--	--	--	--	7.1	71.7	--	--	--	--	--	--	--	--
IDA	0.4	--	--	1.3	8.9	0.5	19.3	--	--	--	--	--	--	--	--	1.6	8.8
Total	1.3	--	--	1.3	8.9	0.5	19.3	7.1	71.7	--	--	--	--	--	--	1.6	8.8
<b>DWS&amp;S</b>																	
World Bank	22.4	42.7	10.7	25.6	8.0	8.8	12.8	16.3	7.3	39.4	35.6	26.7	2.8	100.0	0.9	5.5	1.4
IDA	6.2	1.7	0.4	14.0	4.3	9.6	14.0	--	--	0.4	0.4	21.6	2.3	--	--	24.9	6.2
IFAD	0.1	--	--	0.5	0.2	a/	a/	a/	a/	0.1	0.01	1.4	0.1	--	--	1.2	0.3
Total	28.7	44.4	11.2	40.1	12.5	18.4	26.9	16.3	7.3	39.9	36.1	49.7	5.2	100.0	0.9	31.6	7.8
<b>Total</b>																	
World Bank	69.5	79.9	5.8	46.8	4.2	47.0	19.7	97.5	12.5	97.6	25.3	58.5	1.8	100.0	0.2	8.8	0.6
IDA	28.8	19.7	1.4	51.5	4.6	49.8	20.8	2.4	0.3	1.9	0.4	38.4	1.2	--	--	86.6	6.2
IFAD	1.7	0.4	a/	1.7	0.1	3.2	1.3	0.1	a/	0.4	0.1	3.1	a/	--	--	4.6	0.3
Total	100.0		7.2		8.9		41.8		12.8		25.9		3.0		0.2		7.1

a/ Less than 0.01 per cent.



Table 6. Growth rates and percentage of total yearly disbursements by sector and by region, a/ 1976-1985

Sector/organization	Devel. countries		Africa N.Sahara		Africa S.Sahara		Asia - Pacific		Europe		L.America - Car.		W. Asia		LDCs	
	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate	% of fin.	Growth rate
<u>Agriculture</u>																
Total	100.0	21.43	100.0	6.08	100.0	5.49	100.0	29.43	100.0	18.18	100.0	24.34	100.0	0.69	100.0	8.59
World Bank	58.7	21.89	60.0	8.89	16.8	18.36 <u>b/</u>	45.8	25.32	96.2	27.41	96.4	25.77	63.2	4.10	1.91	<u>e/</u>
IDA	38.4	19.42	39.3	-1.05	80.0	1.50	50.1	31.59	3.7	-59.35 <u>d/</u>	2.4	-	33.5	-7.93	92.63	7.20
IPAD	2.9	63.41 <u>e/</u>	0.7	231.71 <u>f/</u>	3.2	92.21 <u>e/</u>	4.1	58.56 <u>e/</u>	0.1	-17.90 <u>g/</u>	1.2	34.83 <u>h/</u>	3.3	85.78 <u>f/</u>	5.46	86.48 <u>e/</u>
<u>Hydropower</u>																
Total	100.0	2.72	100.0	3.91	100.0	-26.29	100.0	-0.58	100.0	20.01	100.0	4.10	0.0	-	100.0	-
World Bank	91.4	1.18	100.0	3.91	70.1	-29.49 <u>c/</u>	71.5	-38.05	100.0	20.10	97.5	4.12	0.0	-	41.96	-
IDA	8.6	26.74	0.0	-	2.9	-0.51	28.5	251.68 <u>i/</u>	0.0	-	2.5	-	0.0	-	58.04	-
<u>Waterways</u>																
Total	100.0	-1.34	0.0	-	100.0	-	100.0	27.41 <u>j/</u>	100.0	-	0.0	-	0.0	-	100.0	<u>j/</u>
World Bank	71.7	-	0.0	-	0.0	-	0.0	-	100.0	-	0.0	-	0.0	-	-	-
IDA	28.3	-9.78	0.0	-	100.0	-	100.0	-27.41 <u>j/</u>	0.0	-	0.0	-	0.0	-	100.0	<u>j/</u>
<u>DWS &amp; S</u>																
Total	100.0	18.81	100.0	22.50	100.0	26.18	100.0	24.16	100.0	5.14	100.0	19.57	100.0	-1.07	100.0	27.88
World Bank	78.0	17.96	96.1	23.48	63.9	22.42	47.7	21.28	99.7	4.98	98.9	18.58	53.7	-14.58 <u>b/</u>	17.26	18.83
IDA	21.5	22.01	3.9	-	34.9	34.31	52.2	27.22	0.0	-	1.1	48.65 <u>e/</u>	43.4	-6.74	78.89	30.34
IPAD	0.5	154.55 <u>e/</u>	0.0	-	1.2	180.10 <u>h/</u>	0.1	75.30 <u>h/</u>	0.3	-17.92 <u>a/</u>	0.01	126.30 <u>h/</u>	2.9	185.15 <u>f/</u>	3.84	223.54 <u>h/</u>
<u>Total disbursements</u>																
Total	100.0	16.64	100.0	11.99	100.0	7.71	100.0	25.35	100.0	17.15	100.0	13.49	100.0	0.22	100.0	12.62
World Bank	69.5	14.91	79.9	14.55	46.8	3.11	47.0	20.40	97.5	21.16	97.7	14.06	58.5	5.16	8.81	7.10
IDA	28.8	19.35	19.8	1.31	51.5	10.60	49.8	28.90	2.4	-	1.9	-3.69	38.4	-7.33	86.61	11.62
IPAD	1.7	66.93 <u>e/</u>	0.3	231.71 <u>f/</u>	1.7	107.71 <u>e/</u>	3.2	58.86 <u>e/</u>	0.1	-17.91 <u>g/</u>	0.4	44.72 <u>h/</u>	3.1	102.55 <u>f/</u>	4.58	110.19 <u>e/</u>

a/ Growth rates computed through the regression line  $\log y = a+bx$ .

b/ From 1977 to 1985.

c/ No disbursements from 1983 to 1985.

d/ From 1976 to 1980; no disbursements after 1980.

e/ From 1979-1985.

f/ From 1981-1985.

g/ From 1983-1985; no disbursements prior to 1983.

h/ From 1980-1985.

i/ From 1982-1985; no disbursements between 1973 and 1981.

j/ From 1976-1984; no disbursements for 1985.

credits to that region increased from 1976 to 1979, declined through 1984 and picked up again in 1985. Shares of loans and credits to Africa north of the Sahara and Western Asia declined throughout the period. The least developed countries as a group, however, were able to increase their share from 7.5 per cent in 1976, to 8.7 per cent in 1985. In this particular case, the share of disbursements from total World Bank loans decreased from 1 per cent in 1976, to 0.6 per cent in 1985. IDA credits increased from 10.3 to 22.3 per cent.

31. A concentration of loans and credits in a few countries is also noticeable in each of the regions. In Asia and the Pacific, 87.9 per cent of disbursements on World Bank loans for the region have taken place in four countries (Indonesia, the Philippines, the Republic of Korea, and Thailand). India accounted for 62.8 per cent of disbursements of IDA credits (34 per cent of total IDA disbursements for water-related projects in all developing countries). In Latin America and the Caribbean, three countries (Brazil, Colombia and Mexico) received 80.5 per cent of disbursements from World Bank loans; while five countries (Bolivia, the Dominican Republic, Ecuador, Haiti and Honduras) accounted for 98.7 per cent of disbursements from IDA credits. In Africa south of the Sahara three countries, Côte d'Ivoire, Kenya and Nigeria, accounted for 61 per cent of disbursements from World Bank loans; another four countries, Cameroon, Ghana, Malawi and Zambia, accounted for an additional 27.3 per cent. Two countries, Madagascar and the Sudan, accounted for 39.1 per cent of disbursements from IDA credits. Another five countries, Chad, Ethiopia, Malawi, Senegal and Zaire, accounted for an additional 26.1 per cent of disbursements. In Africa north of the Sahara, Egypt accounted for 97.6 per cent of IDA disbursements. In Western Asia, the Syrian Arab Republic accounted for 77.9 per cent of World Bank loans, while Yemen accounted for 49.7 per cent of IDA credits. In the case of the least developed countries, the totality of disbursements for World Bank loans took place in four countries, namely, Botswana (30.2 per cent), Ethiopia (9.9 per cent), Malawi (38.1 per cent), and the United Republic of Tanzania (21.8 per cent). As far as IDA disbursements in the least developed countries are concerned, 58.5 per cent accrued to them; to Bangladesh (27.4 per cent), Nepal (11.9 per cent) and the Sudan (19.2 per cent).

(a) Irrigation and drainage

32. Disbursements from loans and credits for irrigation and drainage increased at an overall annual rate of 21.4 per cent. The highest growth rates were registered in Asia and the Pacific, followed by Latin America and the Caribbean. In the latter, IDA credits diminished steadily from 1976 until 1983 and then ceased altogether. In Europe, where disbursements from IDA credits for irrigation and drainage ceased by 1981, yearly disbursements from various sources increased at an average rate of 27.4 per cent.

33. Disbursements from World Bank loans and IDA credits for irrigation and drainage in Asia and the Pacific accounted for 74.7 per cent and 77 per cent respectively of all disbursements for water-related projects in the region. Out of these, three countries (Indonesia, the Philippines and the Republic of Korea) accounted for 76.9 per cent of World Bank disbursements in the sector, and another two countries (Malaysia and Thailand) accounted for an additional 19.9 per cent of

disbursements. In the case of IDA credits, India accounted for 63.4 per cent of total disbursements for the sector. In Latin America and the Caribbean, where irrigation and drainage accounted for 23.6 per cent and 30.2 per cent of World Bank and IDA disbursements respectively, one country, Mexico, received 80.7 per cent of World Bank funding for the sector, and one country, the Dominican Republic, received 75 per cent of disbursements from IDA credits.

34. Overall rates of increase in funding for irrigation and drainage in Africa north and south of the Sahara were insufficient to compensate for inflation. In Africa south of the Sahara, disbursements for World Bank loans for irrigation and drainage, distributed among four countries, Côte d'Ivoire, Kenya, Malawi and Nigeria, accounted for only 13.3 per cent of the total for water-related projects. For IDA credits which accounted for 57 per cent of the total, one country (the Sudan) received 43.9 per cent of the total for the sector, and another four countries (Chad, Ethiopia, Madagascar and Senegal) accounted for an additional 33.6 per cent.

35. In Western Asia, disbursements for irrigation and drainage in current dollars remained at a stand-still over the 10-year period. In fact, the decrease in real terms in IDA credits was quite significant (about 15 per cent per year). Two countries, the Syrian Arab Republic and Iraq, received the totality of World Bank funding for the sector, while one country, Yemen, received 69.4 per cent of IDA funding for the sector. Two other countries, the Syrian Arab Republic and Jordan, received the remainder of the funding in this sector.

36. In the case of the least developed countries, increases in overall disbursements for irrigation and drainage barely kept pace with inflation. Disbursements from World Bank loans, all of which accrued to Bangladesh, ceased altogether by 1983; while disbursements from IDA credits remained stagnant in real terms (increasing at an average rate of 7.3 per cent in current dollars). Only disbursements from IFAD registered any significant growth. Disbursements from IDA credits for irrigation and drainage accounted for 65.9 per cent of the total for water-related projects. Two countries, Bangladesh and the Sudan, received 59.5 per cent of the total for the sector. Another three, Equatorial Guinea, Nepal and Yemen, received an additional 26.9 per cent.

37. Regardless of whether repayments for loans and credits are made directly from project-generated finances, or from general economic development funds, it is unlikely that in the long run Governments would have an increasing or even steady demand for them unless returns from the related investment projects are commensurate with the terms and conditions associated with the source of finances. It is not surprising, therefore, that loans and credits would tend to flow at a higher rate towards regions, and to countries within them, where agricultural production yields greater returns, and where irrigation and drainage have traditionally received greater institutional, technical and managerial support. Nor is it surprising that regions and countries where irrigated agriculture is less profitable would be more vulnerable to unfavourable overall economic conditions. In the latter, it could be expected that soft loans or credits would fare better than loans provided under harder conditions. Yet, for Africa south of the Sahara and for Western Asia even soft loans were not forthcoming. In many cases the issue

at this point seems to be whether investment projects are capable of generating sufficient returns to justify repayment regardless of the rate of interest charged on credits or loans.

38. To the extent that this holds true, there is a need for greater efforts in the form of technical co-operation projects, not only for the identification and design of viable investment projects, but also, and perhaps most particularly, for the purpose of bringing about the social, economic, managerial and technical infrastructure needed for the development of the agricultural sector.

(b) Drinking water supply and sanitation

39. Drinking water supply and sanitation, accounting for 28.7 per cent of the total, constituted the second largest recipient of disbursements from loans and credits. Disbursements from World Bank loans accounted for 78 per cent, while credits from IDA provided 21.5 per cent of the total. IFAD provided a small (0.5 per cent) but significant proportion of the total, in that it provided funding for rural water supply projects. The bulk of World Bank and IDA financing (between 80 to 90 per cent of the total) was allocated to urban projects.

40. Rates of increase for Africa (both south and north of the Sahara), Asia and the Pacific, Latin America and the Caribbean, and for the least developed countries as a group were in the range of 19.5 to 27.8 per cent. In Europe, the rate of increase in funding was insufficient to compensate for inflation, and disbursements actually decreased since 1982. Disbursements for Western Asia decreased over the 10-year period at a rate which, in real terms, was quite significant (about 8.6 per cent per annum).

41. As in the case of irrigation and drainage, there is a tendency, although perhaps not as pronounced, toward a concentration of funding in a limited number of countries in each region. In Africa south of the Sahara, 73.2 per cent of disbursements from World Bank loans was allocated to three countries (Côte d'Ivoire, Kenya and Nigeria), while eight other countries accounted for the remainder. Two countries (Zaire and Somalia) accounted for 37 per cent of disbursements from IDA, while the rest of the funds accrued to 15 other countries. In Latin America and the Caribbean, Brazil and Bolivia accounted for 75.9 per cent of World Bank funding, the rest going to 11 other countries in the region. Bolivia and Haiti accounted for the near totality of IDA credits. In Asia and the Pacific, India received 68.7 per cent of IDA credits, and six countries accounted for the totality of World Bank loans. In Western Asia, the Syrian Arab Republic accounted for 89.5 per cent of World Bank funding. In the case of the least developed countries, total disbursements from loans were divided among Botswana (48.9 per cent), Ethiopia (15.9 per cent) and the United Republic of Tanzania (35.2 per cent). IDA credits were more evenly divided among 13 countries.

42. The question of the socio-economic viability of projects, and more specifically the capacity for cost recovery from water supply and sanitation facilities, is as crucial an issue in this sector as it is for irrigation and drainage, or for that matter any other sector, especially in terms of securing loans and credits. Governments can, if they choose, repay loans out of general

economic development funds, without recourse to at least a partial cost recovery policy, if they deem that the expected benefits from specific investment projects warrant this approach, or if they decide not to pursue an explicit cost recovery policy. On the whole, however, such an approach is less likely to secure increasing amounts of external financing in the form of loans and credits designed to bring about a rapid and steady expansion of water supply and sanitation services. The existing bias toward urban water supply and sanitation projects, therefore, should not be surprising.

43. There is little doubt that if significant amounts of additional funding were to become available, particularly for rural water supply and sanitation, most Governments would need to pursue systematically at least partial cost recovery policies. Clearly, this may not be possible or desirable in all instances. Often, the expected health and other benefits to be derived from improved rural water supply and sanitation may outweigh the very limited or even non-existent capacity for the payment of services by the rural poor. Still, there is growing evidence that a potential for cost recovery in rural areas exists more frequently than had previously been suspected. Often the question is more one of finding suitable ways of generating local financing than whether the capacity for payment exists.

(c) Hydropower

44. Disbursements from loans and credits for hydropower development, the bulk of which were provided by World Bank loans, constituted another 15.4 per cent of total funding. As far as possible, figures on disbursements reflect investments in the water resources development component, excluding investments in electricity generating equipment and transmission lines. The importance of the sector varied significantly among regions. Latin America and the Caribbean received 61 per cent of disbursements in the sector, and in turn, these disbursements constituted 36.2 per cent of the total for the region, second only to the drinking water supply and sanitation sector. In Europe, and in Africa south of the Sahara, where disbursements for hydropower development accounted for 10.3 and 12 per cent of the total respectively, they also constituted 10.3 and 12.4 per cent of disbursements in these regions. In Asia and the Pacific, disbursements for the sector (11.8 per cent of the total) constituted 4.3 per cent of disbursements for the region.

45. Disbursements on hydropower development over the last 10 years have increased at a very slow rate of 2.7 per cent per year. In real terms this represents an actual decrease of approximately 5 per cent per year. The only overall significant increase in funding took place in the case of IDA credits, especially to Africa south of the Sahara between 1976 and 1982 (followed by a sharp decrease in the following two years), to Latin America and the Caribbean in 1981 and to Asia and the Pacific between 1982 and 1985.

46. As for World Bank loans, disbursements to Africa north of the Sahara rose between 1977 and 1979 and have subsequently declined. Similarly in Asia and the Pacific disbursements have fallen dramatically after a period of increases between 1976 and 1979. In Africa south of the Sahara disbursements fell steadily from 1976 to 1984, when they ceased altogether. Europe is the only region that showed any

consistency in increases in funding with the exception of a three-year period between 1978 and 1981.

(d) Inland waterways

47. To the extent that it has been possible to determine disbursements concerning the development of inland waterways (exclusive of port and other facilities), it would appear that only a very minor part of loans and credits (about 1.3 per cent of the total) were directed to this sector. It seems that disbursements in the sector were significant only in Europe, which accounted for 71 per cent of the total. Funding for this sector has been sporadic in nature, and limited to a few countries.

(e) Multi-purpose développement

48. Clearly, not every project lends itself to a multi-purpose development of a river or ground-water basin. Nevertheless, the evidence at hand seems to suggest that while a multi-purpose approach to water resources development is not the exception, it is not being utilized to its full potential. To the extent that this is the case, investment funds are not being utilized as efficiently as they could be, nor are the benefits derived from projects as large as could be expected. The problem arises from the lack of integration of water resources planning within overall economic development planning, and among the various possible water resources uses themselves.

B. Resource flows through other external support organizations

49. Information concerning resource flows through international and regional organizations and funds outside the United Nations system, and bilateral programmes was collected through WHO's catalogues of external support. Additional information was sought directly from a number of organizations in order to supplement that available in the WHO catalogues.

50. The information collected does not lend itself to an analysis of trends. Reporting periods differ in length and time from one organization to another. In some cases organizations reported disbursements for a given year or number of years, while others reported cumulative disbursements for a given period of time, without indicating the pattern of disbursements for each year; or even commitments in the form of loans and grants for a number of projects. In these cases, some inferences were made as to what the order of magnitude of disbursements for a given year would be on the basis of average yearly disbursements over the apparent life of projects, or on the basis of assumptions as to what the rate of disbursements might be for commitments for the funding of projects. Clearly, this procedure can only provide a general order of magnitude of disbursements for a given year.

51. These general estimates include assistance given in the form of both grants and loans. Again, it was not always possible to distinguish between the two forms of support, as figures from some organizations included both. Interest charges on loans and credits ranged between a service charge for the disbursed parts of the loans, to rates comparable to those charged on World Bank loans.

52. Total yearly disbursements in the form of grants, credits and loans from sources other than the United Nations system of organizations seem to be on the order of \$2.5 billion. Of this total, some 52 per cent has been disbursed for drinking water supply and sanitation projects, 15 per cent to irrigation and drainage, 19 per cent to hydropower development and multi-purpose projects, and some 14 per cent to management and environmental aspects of water resources. While the available information does not shed light on trends for disbursements in these various aspects, it is known that in recent years organizations have attached a great deal of importance to drinking water supply and sanitation projects, and that in some cases, significant increases in funding for this purpose have taken place. Within this sector, organizations have endeavoured to stress the expansion of services in rural areas.

53. Again, it was not possible to make a regional analysis of disbursement patterns because of the lack of sufficiently detailed information. It is known, however, that bilateral aid programmes in general have focused particularly on assistance to Africa, and that in some cases, as much as 60 to 70 per cent of their disbursements are channelled to that region, with emphasis on drinking water supply and sanitation. In the case of funding from regional banks and funds, it would appear that the resources available to those specifically for Africa are much smaller than those for Latin America and for Asia and the Pacific.

#### C. Suggestions for approaches at the international level

54. Total disbursements from external support organizations for water resources development have grown to approximately \$4.5 billion per year. Increases in funding, both on a regional and sectoral basis, have been impressive in some cases and disappointing in others. There is no question, however but that the International Drinking Water Supply and Sanitation Decade has made a significant contribution in mobilizing resources for the purpose of drinking water and sanitation.

55. Increases in external support, however, need to be seen in the context of two disturbing facts, namely the very high estimated funding requirements for water resources development, and the heavy dependence of many developing countries on external financing.

56. On a global basis, disbursements from the international community in support of water resources assessment may constitute as little as one fiftieth of total yearly requirements as estimated at the time of the Water Conference. For drinking water supply and sanitation, total external support may constitute anywhere between one twentieth and one fortieth of total requirements. In the case of irrigation and drainage, funding requirements may be close to 15 times the current levels of yearly disbursements.

57. It is beyond doubt that increases in external support will continue to be important in the near future, and that these increases need to be particularly significant in the case of grants and concessional financing. Yet, no matter how rapid the growth in external financing may be in the near future, such efforts will

remain vastly insufficient unless they are matched by much larger increases in national investment. On a global basis it seems highly unlikely that the prevailing patterns of funding would produce long-term sustainable development.

58. It is suggested, therefore, that financial and technical support for water resources development and utilization from the international community must continue to increase, and that, in addition, the efficiency of procedures for the approval and implementation of projects must be improved. At the same time, there is a need for international organizations to increase their efforts aimed at strengthening countries' capacity to generate larger amounts of national and local financial resources, and to use more efficiently those that are already available.

59. External support organizations, together with recipient Governments are turning their attention to finding solutions to these problems. They are focusing increasingly on the institutional and legal aspects of water resources but within the context of the International Drinking Water Supply and Sanitation Decade and with regard to water resources development in general. More attention is also being given to the use of suitable low-cost technologies and to operation and maintenance.

60. The project-oriented approach prevailing in most developing countries is often reflected in the nature of the financial and technical co-operation provided by external support organizations. Inevitably, external support to developing countries also tends to be project-oriented, lacking a concerted approach which responds to priority needs and well-defined strategies. National authorities need to develop a co-ordinated approach to external financing in order to achieve as good a response as possible to their priorities.

61. Although much remains to be done in this regard, there is an increasing awareness, both at the national and international level, of the need to bring about greater cohesion in approaches to external support for water resources development. In the case of drinking water supply and sanitation, an increasing number of national or regional consultative meetings are being organized between various external support organizations and Governments designed to define priorities, strategies and programmes. It is suggested, however, that such consultations need to be broadened to bring about a more integrated approach to co-operation for all aspects of water resources development, including such activities as water resources assessment, designed to provide basic information for planning and project formulation.

### III. THE ROLE OF GOVERNMENTS

62. As mentioned previously, a very large proportion of the financial resources needed for the development and utilization of water resources still stems from external sources. If significant progress is to take place in the future, the developing countries themselves will inevitably have to bear a greater share of the burden for mobilizing the financial resources required to accelerate the pace of water resources development. A decreasing dependence on external financing is a necessary condition for sustained development, although this alone will not be enough. Developing countries need to take measures aimed at increasing the flow of



national financial resources for water resources development and utilization, and they also need to take measures designed to increase the efficiency of such investments.

63. The availability of well formulated and soundly designed projects, with clearly stated objectives and well defined costs and benefits, remains a critical element in securing both internal and external financial resources. Unless water resources projects are demonstrably capable of generating socio-economic benefits commensurate with those being generated by other sectors of the economy, they will not be able to command the necessary financial resources. In order to formulate effective projects it is necessary to undertake a process that takes into account the relevant socio-economic objectives and policies.

64. As in other cases, water resources development need not, and often does not, depend exclusively on general development financing. Policies aimed at securing direct payments from beneficiaries can be instrumental in securing predictable sources of financial resources commensurate with the demand for them, provided they are compatible with the socio-economic objectives of the country.

65. The concept of direct payments by beneficiaries is gaining increasing support for different water resources uses. In some cases, it may also be appropriate to develop a system of direct payments for intermediate services, such as those required for water resources assessment, which are designed to produce technical and economic information needed for efficient project planning, design and management. Since the information is usually produced by a government ministry or office, and used by another, payment for the information involves transfers between ministries or departments. Nevertheless, the application of this approach may be quite useful in the case of water resources assessment, in that offices dealing with this aspect of water resources development have been particularly vulnerable to budgetary cuts at times of economic hardship, without necessarily benefiting during times of prosperity.

66. The use of water tariffs is most prevalent in the case of urban water supply systems, to the point where urban utility organizations are often in a position to seek partial, if not full, recovery of fixed and operating costs. It is not surprising, therefore that urban water supply utilities are often able to generate a large proportion of internal and external financing. Consequently, the objectives of the International Drinking Water Supply and Sanitation Decade are more likely to be reached in this sector than in others.

67. The provision of services to the population in peri-urban areas, which represents a growing problem in several areas of the world, often requires costly expansions of existing systems. Although the inhabitants of these areas constitute the poorer strata of the urban population, the available evidence suggests that there is, nevertheless, a potential for some kind of payment for water supply services. In fact, in many cases services provided by properly organized and managed utilities could require lower payments than those being exacted from other sources. To the extent that services are provided by the same utility companies which supply the rest of the urban population, the rates charged to the inhabitants of the poorer areas could be integrated into an overall rate system.

68. The question of generating financial resources for water supply and sanitation in the rural areas of developing countries is a much more difficult one. It is now becoming increasingly evident that, while rural areas may be in no position to be financially self-sufficient, there is often a greater potential for the generation of funding and for cost recovery than has been generally assumed, and, as noted above, there is growing evidence of the willingness and ability of rural populations to pay some form of fees for the provision of improved services. The key lies in community participation, not only for the design and implementation of projects, but also for their financing. Strong local organizations are needed, with a managerial component capable of designing cost recovery policies and operation and maintenance programmes, as well as monitoring their implementation.

69. To the extent that cost recovery policies are compatible with Governments' socio-economic objectives, and with the capability of rural populations to pay for improved services, Governments might actively pursue the formulation and implementation of such policies, coupled with the establishment of strong managerial structures at the level of rural communities. Also, both Governments and the international community, should seek to make more funding available specifically for project development in such communities.

70. In this regard, Governments could consider organizing revolving funds for the financing of rural water supply and sanitation projects through credits to communities which are in a position to repay them over a period of time. International, regional and bilateral organizations could also envisage the possibility of channelling larger amounts of funding in the form of loans and credits for rural water supply and sanitation projects which demonstrate a capability for repayment. Alternatively, they could contribute, through loans, credits and grants, to the establishment of national revolving funds, which in turn would deal with the rural communities. Where such conditions exist, and where it would be compatible with national socio-economic and political objectives, a more active role for the private sector could also be encouraged.

71. The use of some form of water tariff is equally important in the case of irrigation and drainage. As in the case of drinking water supply and sanitation, the effective implementation of water pricing policies depends on the existence of suitable administrative structures. In the case of irrigation and drainage, however, the economic viability of projects is further complicated by conditions prevailing in international and national markets for agricultural products, and by the nature of national agricultural policies. It is evident that the successful implementation of cost recovery policies for irrigation and drainage would increase the possibilities for obtaining additional loans and credits. In this regard, suitable cost recovery policies could be an important element of small-scale irrigation programmes, particularly in Africa. The concept of national revolving funds is probably as applicable to small-scale irrigation as it is to rural water supply and sanitation.

72. The development of water resources, and the generation of the necessary financing, has for the most part been considered a government function, owing to the magnitude of the investment required for this purpose, the need to weigh the importance of social benefits relative to expected economic returns, and the nature

of existing legislation which restricts the provision of water-related services to State-owned enterprises. There are, nevertheless, opportunities for meaningful participation by the private sector, whenever such policies are compatible with socio-political structures and objectives of the country. Flexible approaches to the participation of the private sector, whereby enterprises are carefully regulated and monitored, could at times bring about an increased flow of resources and a provision of services that might otherwise not become available.

73. The efficient utilization of investment funds is as important as increasing their availability. This involves choices as to the type and levels of services to be provided, technology and designs, the efficient administration of projects, and effective operation and maintenance. Efficiency in design and choice of technology have proved to be extremely important in the case of rural water supply and sanitation. Decisions as to the type, location and level of service coverage have significant impacts upon choices of technology and ultimately on unit costs. The choice of designs and construction techniques, and the choice of equipment have a profound effect on the life-span of supply sources, and on costs of production. In the case of irrigation and drainage, investment costs in Africa are known to be much higher than in other regions, thus not only increasing investment requirements, but also diminishing the profitability of projects.

74. The existence of efficient operation and maintenance procedures is without a doubt one of the most critical elements in the successful running of projects and the efficiency of investments. It is well known that the very high rates of break-down of rural water supply and sanitation installations, and similar problems in the case of irrigation, significantly reduce services, and increase investment requirements for the rehabilitation of old systems or the establishment of new ones. Unless adequate operation and maintenance procedures are an integral part of a project, whether it be water supply and sanitation, irrigation and drainage or any other type of project, the project will inevitably operate well below normal efficiency, and the benefits derived from it will be short-lived.

75. It is encouraging to note that the importance of this issue is gaining increasing recognition. Operation and maintenance have become major areas of concern within the International Water Supply and Sanitation Decade, as well as in the development of irrigation and drainage. There is an increasing realization of the need to place responsibility at the project level where services are provided, and recognition that any serious attempt at improving operation and maintenance implies a strengthening of local and regional authorities. The importance of community involvement is now being recognized as essential and, at the same time, that community participation needs to be developed through well-defined organizational structures, including the delegation of responsibility to village committees specifically organized for that particular purpose. Likewise, the experience with irrigation and drainage projects argues in favour of a delegation of responsibilities to the farm level, together with strong centralized national technological and organizational support including the training and motivation of users.

76. As has been mentioned previously, there is a strong tendency in all countries to approach the question of water resources development from a very project-specific point of view, without adequately taking into account other uses and possible related benefits. It is increasingly apparent that the efficient development of water resources is seriously hampered by a lack of linkages with overall economic development planning and policy formulation, and poor co-ordination and integration among various government agencies dealing with water resources development and utilization. A lack of coherence between socio-economic policies and water resources policies plans and programmes can easily result in over-investment in services for which there may be a lack of effective demand, thus bringing about imbalances among alternative investment possibilities. A lack of proper plans and inadequate project definition, where technological and human resources requirements have not been properly assessed, may result in programmes which are difficult or impossible to implement.

#### Notes

1/ World Health Organization, Catalogue of External Support, International Drinking Water Supply and Sanitation Decade, publication No. 7 (Geneva, 1985).

2/ See Food and Agriculture Organization of the United Nations, Agriculture: Towards 2000, Economic and Social Development Series, No. 23 (Rome, 1981).

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