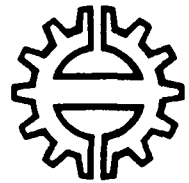


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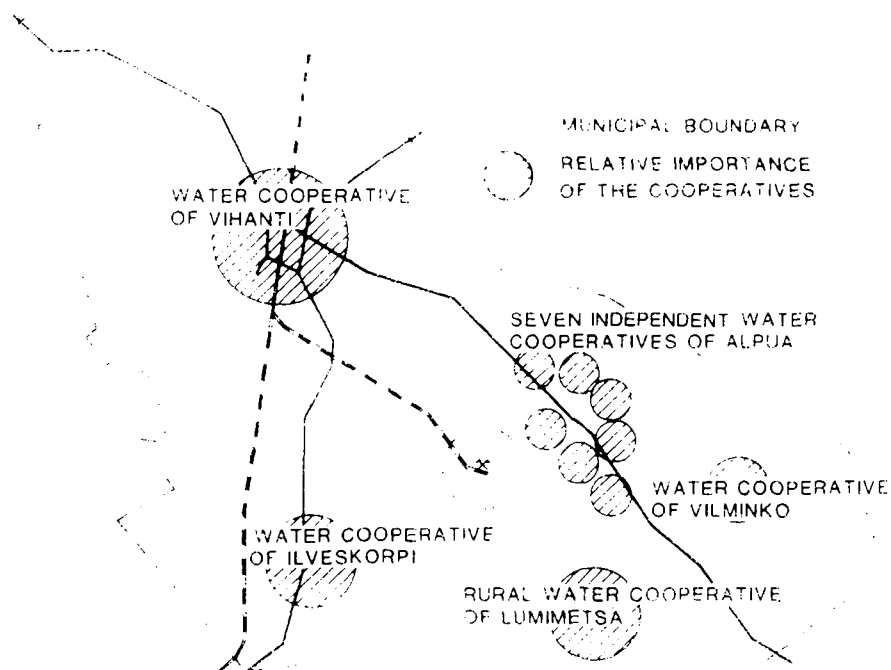
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-Seminar Paper

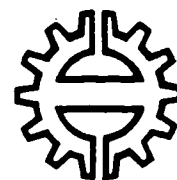


Tampere, Finland 1989

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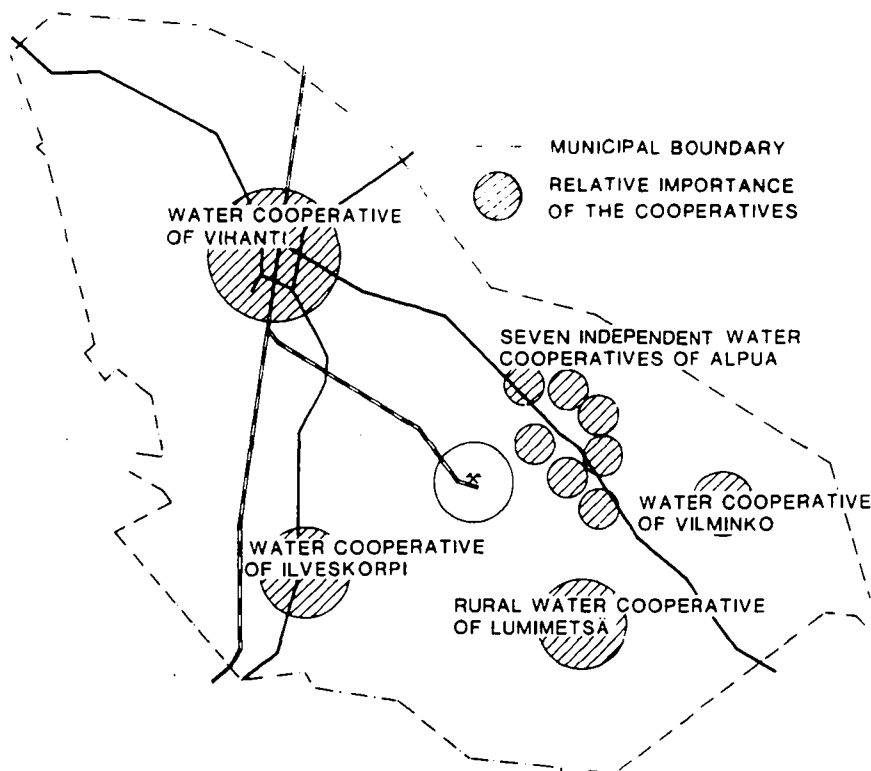
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INSTITUTIONAL ALTERNATIVES OF WATER SUPPLY SERVICES

Report of the Round-Table Seminar held 22 March 1989 at
Tampere University of Technology (TUT)

Edited by Mr. H. Morange and Mr. T. Katko (TUT).

June 1989

INSTITUTIONAL ALTERNATIVES OF WATER SUPPLY SERVICES Page

Round-Table Seminar, Wednesday 22 March 1989

TABLE OF CONTENTS

List of Participants	2
Opening Speech, Mr. R. Häkkinen, TUT	3
Concluding Remarks, Mr. H Morange, TUT	4
Additional Conclusion, Mr. T. Katko, TUT	6
Institutional Views on the Water and Wastewater Works of the City of Hyvinkää, Mr. M. Lahtinen, Hyvinkää City Water and Sewage Works	7
Discussion	21
Development of Consumer Initiated and Managed Water Supply Cooperatives in Vihanti, Mr. E. Kotila, Vihanti Water Company	24
Discussion	31
Recent Development Strategies of Water Supply in Sparsely Populated Rural Areas in Eastern and Central Finland, Dr E. Mälkki, Water and Environment District of Kuopio	35
Discussion	37
Examples of Institutional Constraints in Developing Countries, Mr. H. Vikman, the National Board of Waters and Environment	38
Discussion	44
Institutional Development Needs in Sub-Saharan Africa, Mr. T. Skyttä, The World Bank	47
Discussion	59
Institutional Development Trends of Water Supply in Finland, Dr H. Kiuru and Mr. M. Korhonen, The Association of Water Supply and Sewerage Works (summarized and presented by Mr. T. Katko)	62
Discussion	66

INSTITUTIONAL ALTERNATIVES OF WATER SUPPLY SERVICES

LIST OF PARTICIPANTS

Invited Reporters:

E. Kotila, Vihanti Water Cooperative
 M. Lahtinen, Hyvinkää City Water and Sewerage Works
 E. Mälkki, Kuopio District Office of Water and Environment
 T. Skyttä, The World Bank
 H. Vikman, National Board of Waters and Environment

Invited Experts:

H. Hermunen, Finnmap Ltd.
 P. Hämäläinen, Viatek/Finnconsult
 S. Lehtinen, Vesi-Hydro Ltd.
 M. Rantala, YIT Ltd.
 P. Rantala, Air-Ix Ltd.
 O. Seppälä, Plancenter Ltd.

TUT: PG-Course Participants:

Asnake Azeb, Ethiopia
 Samson Babala, Tanzania
 Abate Demissew, Ethiopia
 Hagos Gebreyohannes, Ethiopia
 Worku Getachew, Ethiopia
 Kiflegiorgis Goitom, Ethiopia
 Modhakkiru Katakweba, Tanzania
 Edward Kelengwe, Kenya
 Beda Lyimo, Tanzania
 Yassin Makongwa, Tanzania
 Abdallah Matauna, Tanzania
 Lemma Mesfin, Ethiopia
 Anne Mwangi, Kenya
 Sheukindo Sabuni, Tanzania
 Marco Shakinyau, Tanzania
 Charles Sichizya, Zambia
 Joseph Singano, Tanzania
 Bamnew Tadesse, Ethiopia

TUT: Staff Members:

J. Hukka
 R. Häkkinen, chairman
 T. Katko, rapporteur
 H. Mattila
 H. Morange, rapporteur
 J. Peltokangas
 P. Pietilä
 S. Sandelin

OPENING SPEECH

By Mr. R. Häkkinen
Course Director, TUT

This round-table seminar continues the tradition of one day seminars, that have been organized during the present decade at TUT as a part of the training and research activities in water supply and sanitation for developing countries.

This time the topic of the seminar is "Institutional Alternatives of Water Supply Services"; the purpose of the seminar is firstly to present the variety of institutions that are in charge of water supply development in Finland. This is done by presenting a few case studies. Although the experiences are not necessarily directly transferable to or replicable in developing countries, it is believed that there are a number of important issues that could be relevant in any conditions. Secondly, two presentations will concentrate on the institutional development needs and possibilities in developing countries in the water supply and sanitation sector.

In the developing world water supply and sanitation have traditionally been the responsibility of central ministries or agencies. During the last few years interest for community-managed systems has increased and thus the topic is timely also in developing countries. International agencies in the sector are increasingly interested in the issue.

In addition to being a part of the postgraduate course training activities of TUT, the seminar hopefully will contribute to the currently planned TUT research project on the issue.

I wish you all heartily welcome to our seminar and wish you all will take part in lively and fruitful discussions.

CONCLUDING REMARKS

by Mr. H. Morange
Research Officer, TUT

We intended to organize this seminar to see whether there really exist alternatives within a country for organizing the water supply service.

Technical issues are of importance but the importance of institutional matters' is rising nowadays. We tried to show the Finnish case that several alternatives do exist. In the beginning we had a presentation by a person in charge of a water works governed by the local political body (the municipality). All along the day, in the discussions, the opportunity of continuing such systems has been debated. Other institutions managed directly by the consumers themselves exist, of which cooperatives were presented.

In both cases it appeared to be difficult to define the exact role of the central government as regards of these communities and schemes. In Finland the central government limits its support to financing and to some technical support (advice). It is also in charge of the control and monitoring of quality of environment. Some communities, however, refuse to accept financial support from the central body to preserve their independence and control over the vital element: water.

Thus, several institutional alternatives do coexist within a single country such as Finland. Let alone countries, where central governments have very different general policies.

It would be worthwhile for the technician and the engineer, to realize which kind of institutional structure he is working in and which kinds of proposals he could present to adapt the institutions to its aims.

There is still a lot to do, and we should not forget the improvement of existing institutions.

The problems are often expressed by central government agencies in economical terms, but other aspects might be even more important in explaining the failures of projects. The term "community participaton" is very often used, but we today hear also "community commitment" and "demand driven intervention" - this abundance of terms shows that the discussion is quite confusing, i.e. everybody does not mean the same thing with the terms. Of course each social group has its own interests which are discussed in the political arena. Technicians are also part of the society and, as such, should tell what they think.

Engineers, companies and constructors might fear that community participation could diminish their contracts. They believe that communities are not aware of their own needs. Still, community participation offers a good chance for projects in the long term. The role of water engineers should be redefined, and as a consequence their education should be structured. Water engineers should be able to listen to and to understand their countrymen. A real discussion could start between the population at large and the water supply manager; no longer would it be assumed that the latter knows everything in advance. Thus the fears of the engineers will disappear, the more they will see their interest in the long term, and as a consequence the structures will become more flexible and allow necessary changes.

ADDITIONAL CONCLUSIONS

by Mr. T. Katko
Research Officer, TUT

In spite of the differences in environmental, economic, cultural and social conditions between developing and developed countries the few examples on the institutions responsible for water supply services in Finland have a number of interesting implications for the developing world. The recent trend to hand over the management responsibility for rural type water supply systems to consumers means that appropriate institutions for those consumer or community-managed systems are necessary. It is also obvious that supporting services will be needed. Along with this the role of central agencies and ministries should be thoroughly reconsidered.

There seem to exist several different views on the actual meaning of community participation, involvement and responsibility. Whichever term is used, it should be understood so that the consumers should have the main responsibility and take the initiative, if possible, whereas the external and governmental involvement should be of supporting and not of imposing nature.

It is obvious that the experiences from community-managed water supply and their development paths in today's developed countries, and also in some developing countries should be analysed. Finland would be an appropriate case country for this kind of analysis due to the long tradition of consumer-managed water supply systems. It is also important to remember that there is a lot that the developed countries could learn from the less developed ones, particularly in the technical, financial, economic and organizational dimensions of water supply.

INSTITUTIONAL VIEWS ON THE WATER AND WASTEWATER WORKS OF THE CITY OF HYVINKÄÄ

by Mr. M. Lahtinen
Hyvinkää City Water and Sewage Works

General

Hyvinkää is a middle-sized city with 39000 inhabitants in southern Finland. The total number of municipal employees is about 2200, or about 5.7 % of the total population. Traditionally Finnish municipalities have had a high degree of self-administration regulated by laws and they have received subsidies from the state budget. Their total expenditure in 1987 was 657 million Finnish marks of which municipal taxes covered 289 million marks (44 %), government subsidies 127 million marks (19 %), municipal charges (water, wastewater etc.) 51 million marks (8 %), and the rest came from other sources (29 %). The total expenditure on water supply was 31 million marks. *

Statistics

The amount of water pumped into the network in 1987 was about 3.35 million m³, and the amount of water sold was about 2.78 million m³. That means that the wastage rate (leakages etc.) was about 17 %. The number of inhabitants joined to the public water supply was 35.500 which means 91 % of the total population. The number of service connections was 4751. The daily per capita consumption was 260 l/p.d, and the total length of waterpipes 197 km.

The amount of waste water treated was about 5.07 million m³ which means that leakages and rain water entering sewers were more than 50 % of the pumped water. About 2.63 million m³ of wastewater was charged for. The total length of sewage pipes was 181 km and there was 45 km of rainwater pipes.

The total number of employees was 55 (Appendix 1).

Organization

The technical office attends to technical matters. The organization chart is shown in appendix 2. The water supply department is responsible for water and wastewater works overall and plant desing, operation and maintenance, house connection and pipe laying. It is also responsible for water and wastewater quality. From the beginning of 1989 also the collection and dumping of municipal wastes became a responsibility of the department.

The water supply department also bills for water and wastewater. In densely populated areas private households are required to join the municipally organized waste collection and treatment system and the water supply department also bills for these services.

*) 1 Finnish Mark (FIM) = 0.23 UD\$ (1989)

Personnel

The organization chart of the water supply department is shown in appendix 3.

Office activities:

- director has to have a suitable Master's degree from recognized university of technology.
- administration: 1 technician and 2 clerks who perform the normal administrative functions including billing for water. It also employs one person for meter reading.
- planning and design: 2 technicians and 2 draughtsmen.
- inspection: 1 technician who inspects water supply system plans of new customers and also their construction work. One clerk performs clerical duties.

Field activities:

- operation's manager (B.Sc. (Eng)) works under the director, and is responsible for operation and maintenance of plants and networks.
- pumping stations and treatment plants: four ground water pumping stations and one artificial ground water plant. One technician and three operators. The operators work in two shifts from 6 a.m. to 2 p.m. and from 2 p.m. to 10 p.m. The pumping stations are highly automated, and possible alarms are displayed to a private security company with which we have an agreement. They contact the operator in charge if an alarm goes off at night.
- pipeline network: the same technician as in the case of the pumping stations is in charge of the maintenance and laying of water pipelines. Under him works one foreman and 5-7 pipefitters.
- plumbing: 1 technician and 3-5 pipefitters. Depending on what needs to be done, the fitters do both house plumbing and pipe laying work. This team does minor repairs and construction work in municipal buildings.
- service connections: 1 technician and 3-5 workers. The water supply department builds service connections from the delivery line up to the plot border, and from there on to the water meter. All the other work including sewage pipe laying in private areas is done by a private contractor employed by the owner of the house.
- sewage water treatment plants: There are four wastewater treatment plants in Hyvinkää. A technician is in charge of their operation and he has 7-8 workers under him. The plants are automated to such a degree, that the personnel works in only one shift. Outside working hours the alarms are registered in the central alarm center as in the

case of pumping stations, and the person on duty is alarmed either by portable radiotelephone or by telephone if he is at home.

- wastewater network: A technician is in charge of the wastewater and storm water pipelines and he has 3-5 men under him. A sewer cleaning truck, a tv-camera and video equipment are also available for the maintenance and inspection of sewers.
- planning: There are two technicians working directly under the director. Two draughtsmen work under the technicians.
- administration: The office has one technician who is in charge of the clerical side of water works. There are also two clerks taking care of billing for water, records, typing and other clerical duties. One person is employed for meter reading.
- inspection: One technician is in charge of inspecting customers' plumbing plans. One person performs clerical duties.
- laboratory: There are two laboratory assistants for both drinking and wastewater analyses.

ECONOMY

Waterworks

Expenditure		Income	
- interests and amortizations	49 %	- water rate incomes	74 %
- salaries and other personnel expenditures	33 %	- water meter rents	3 %
- operation of pumping stations	7 %	- other incomes	23 %
- maintenance of pipelines	7 %		
- others	4 %		

Cashflow calculation:

cash income	9.8 mill.mk
<u>running costs</u>	<u>-6.2 mill.mk</u>
cash surplus	3.6 mill.mk
<u>investments</u>	<u>-3.1 mill.mk</u>
income surplus	0.5 mill.mk
(Appendix 9)	

Sewage works:

Expenditures		Incomes	
- interest an amortizations	68 %	- wastewater rate income	97 %
- personnel costs	4 %	- other income	3 %
- operation of treatment plants	20 %		
- maintenance of pipelines	5 %		
- others	3 %		

Cashflow calculation:

cash income	10.6 mill.mk
<u>running costs</u>	<u>-6.0 mill.mk</u>
cash surplus	4.6 mill.mk
<u>investments</u>	<u>-6.9 mill.mk</u>
income deficit	-2.3 mill.mk
(Appendix 10)	

APPENDICES:

1.	Statistics	10
2.	Organization chart of the technical office	11
3.	Organization chart of the water supply department	12
4.	Water and wastewater charges	13
5.	Water meters 1987	14
6.	Service connection charging principles	15
7.	Example of a service connection	16
8.	Cost and income structure of water and wastewater works	17
9.	Cash flow calculation for waterworks	18
10.	Cash flow calculation for wastewater works	19

City of Hyvinkää

WATER AND SEWAGE WORKS

Statistics 1987

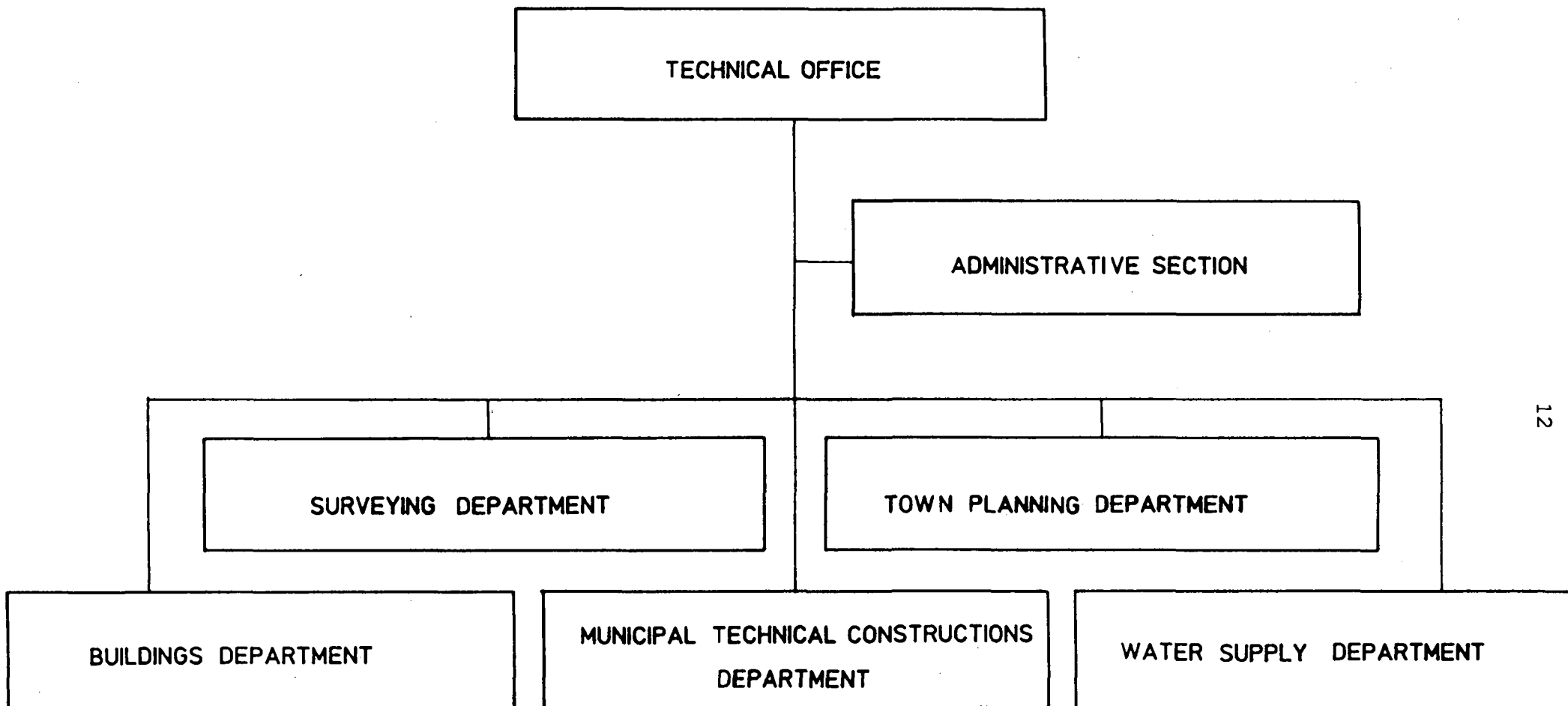
39.000 inhabitants
 35.500 (91%) joined to the public water supply

2200 municipal employees (5.7 % of pop.)
 55 employees in water and sewage works

Total municipal expenditure 657 mill.mk
 taxes 44%
 state subsidies 19%
 municipal charges (water etc.) 8% Others 29%

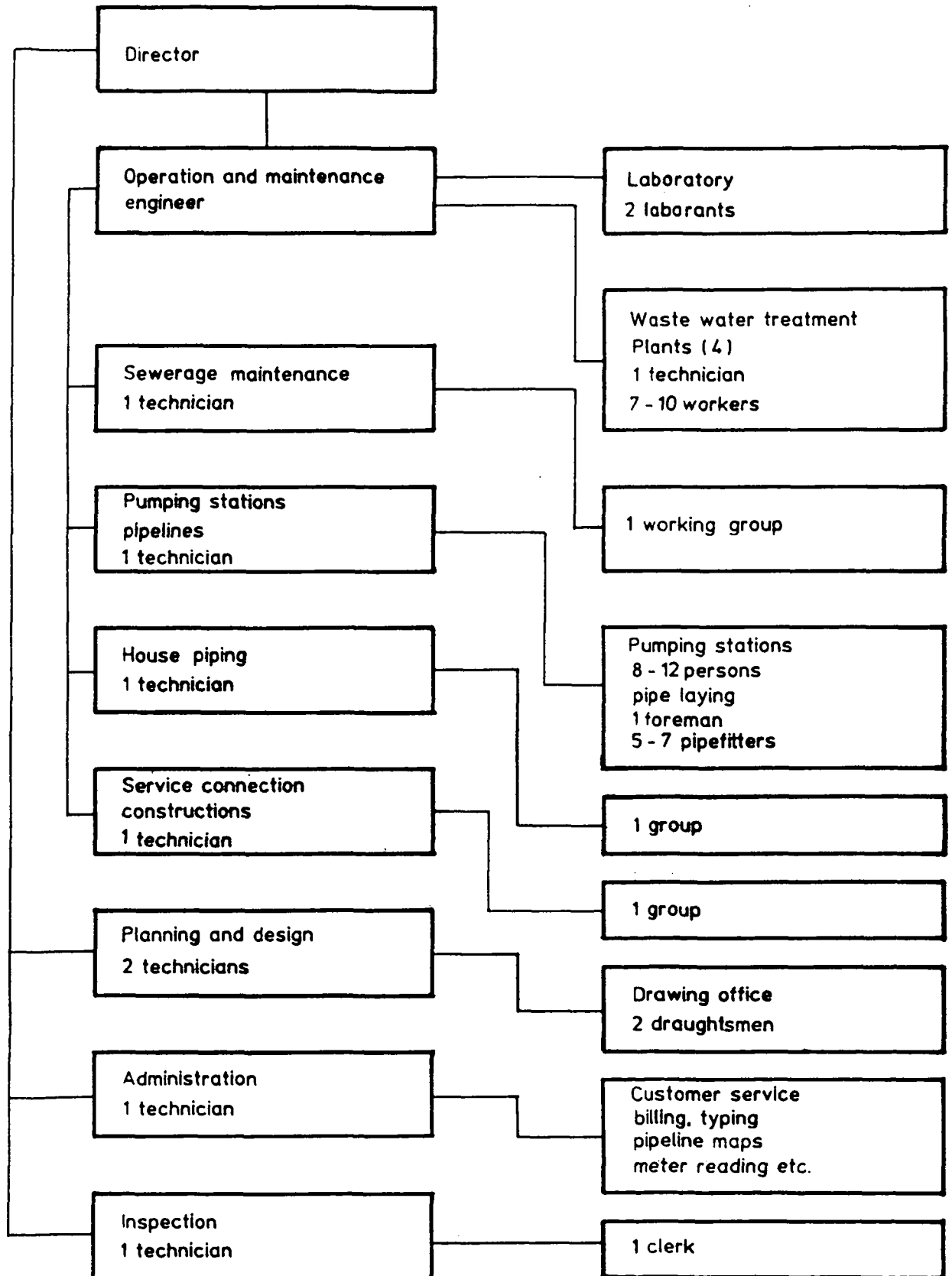
Water and sewage works expenditure 31 mill.mk

Pumped water	3.35 mill.m ³
Water sold (flushing, leakages etc. 17%)	2.78 mill.m ³
Service connections	4751 pieces
Daily per capita consumption	260 l/p.d
Total length of water pipeline	197 km
Treated waste water (leakages and rainwater entering the sewers amount to more than 50% of pumped water)	5.07 mill.m ³
Amount of waste water charged for	2.63 mill.m ³
Total length of sewage pipes	181 km
Total length of rainwater pipes	45 km



WATER AND SEWAGE WORKS ORGANIZATION

APPENDIX 3



Water and sewerage works

WATER AND WASTE WATER CHARGES 1.1.1989

- WATER CHARGE 2.90 mk /m³

-WASTE WATER CHARGE 4.70 mk/m³

Charges are based on water meter readings.

Connection only to sewer

- watertap outside the house 5m³/inh./year
 - water inside the house (pressure) 20m³/inh./year

Water meter rates

meter size mm	annual rate Fmk	meter size mm	annual rate Fmk	meter size mm	annual rate Fmk
20	48.00	80	480.00	100/25	1.896.00
25	72.00	100	552.00	100/30	2.004.00
30	78.00	125	756.00	100/50	2.208.00
40	120.00	150	1.200.00	150/25	2.208.00
50	192.00	100/20	1.800.00	150/40	2.400.00
				150/50	2.808.00

Waterwork's meter charge is 300 Fmk

(If error is less than ±5% the customer pays.)

WATER METERS 1987

meter size mm	5-year changes pcs.	other changes pcs.	new meters pcs.	removed pcs.	changed to bigger size pcs.
20	453	27	124	33	20/30 1pc
25	33	5	7	5	20/40 2pcs.
30	21	—	3	—	20/50 1pc
40	6	3	7	2	40/50 2pcs.
50	1	—	1	—	
65	—	—	—	—	
80	4	2		1	
100	3		2	1	
Yht.	521	37	144	42	6pcs.

meter size mm	changed to smaller size pcs.	inspection reports pcs.	frozen meters pcs.	abandoned pcs.	repaired meters pcs.
20	25/20 16pcs.	9	73	164	285
25	30/20 1 pcs.	—	8	40	—
30	50/30 1pcs.	—	1	23	6
40	80/40 6pcs.	2	1	4	5
50	80/50 3pcs.	—	—	5	6
65	100/40 1pcs.	—	—	—	—
80	100/50 1pcs.	—	—	8	4
100	150/50 1pcs.	—	—	6	2
150				2	
Yht.	30pcs	11	83	252	308

Total amount

15 mm	1 pcs.
20 mm	3.958 pcs.
25 mm	372 pcs.
30 mm	147 pcs.
40 mm	206 pcs.
50 mm	46 pcs.
80 mm	15 pcs.
100 mm	5 pcs.
150 mm	1 pcs.

4.751 pcs. at the end of 1987

103 pcs. increase

Water and sewerage works

APPENDIX 6

SERVICE CONNECTION RATING PRINCIPLES

Only the water supply department is allowed to do house connection work in public areas (streets etc.).

In private areas the water supply dep. Only provides drinking water pipe material and lays the pipe up to the water meter; sewer pipe laying and earth digging are done by approved contractors.

SERVICE CONNECTION, water: work and material from the delivery line up to the water meter. Distance less than 100m.

pipe diameter	charge
32 mm	1400 mk
50 mm	1700 mk
63 mm	2700 mk

· Bigger than 63 mm service connections charged according to real costs.

SERVICE CONNECTION, sewer: work and material from the delivery line to the plot border. Storm water connection is charged for separately.

pipe diameter	charge
110 mm plastic	1200 mk
160 mm plastic	1600 mk
200 mm plastic	2000 mk
150 mm concrete	900mk

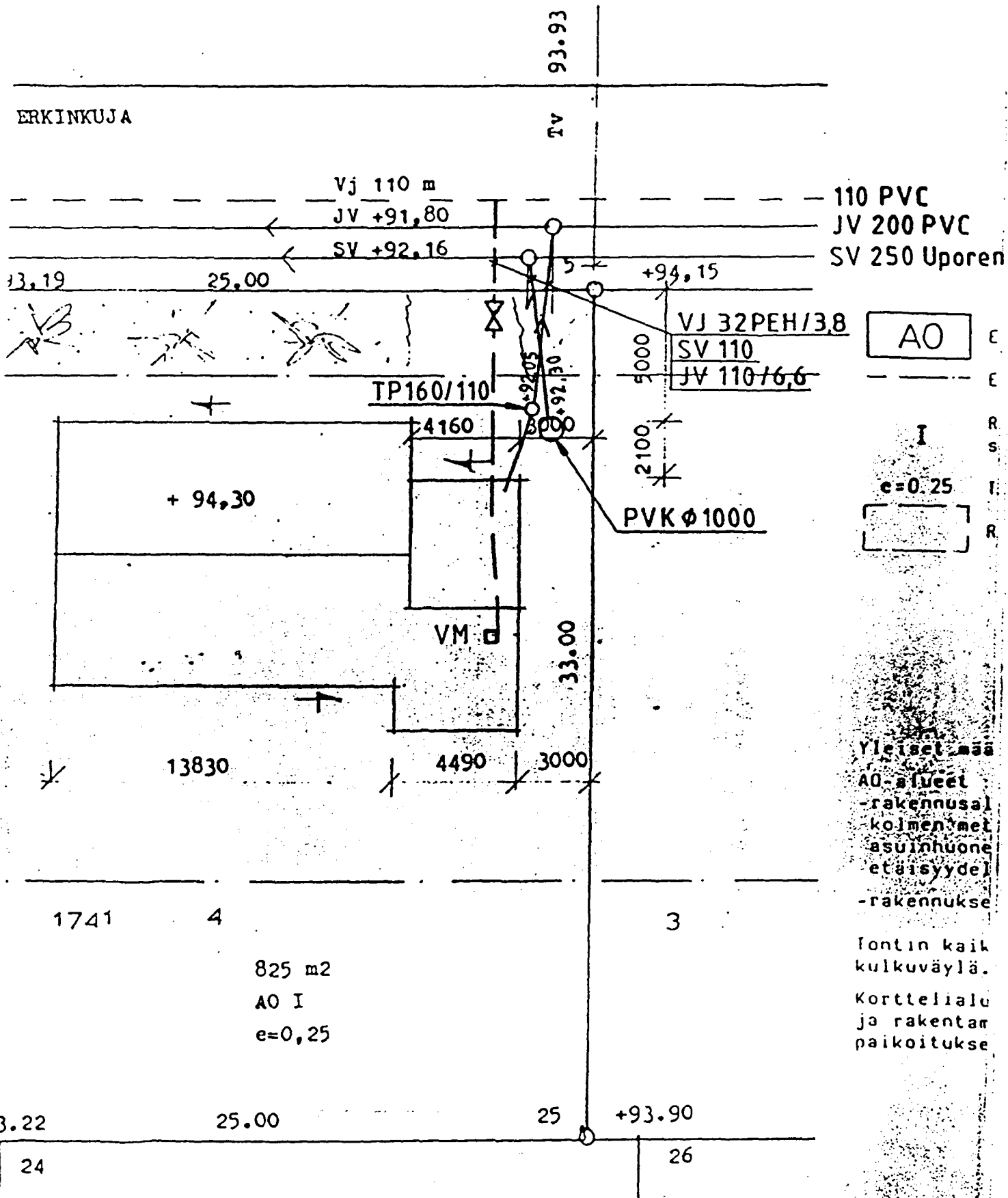
Pipes of different size and material are charged for according to real costs.

EXCAVATION AND FILLING WORK IN STREET AREAS

Asphalt work , rock blasting etc. special work is charged for according to true costs.

In rural areas outside the town plan, service connections are charged for according to true costs.

EXAMPLE OF A SERVICE CONNECTION



A0

I

e=0.25

R
S
I
R

Yleiset mää

A0-alueet

- rakennusaj
- kolmen met
- asuinhuone
- etäisyydel
- rakennukse

fontin kaik

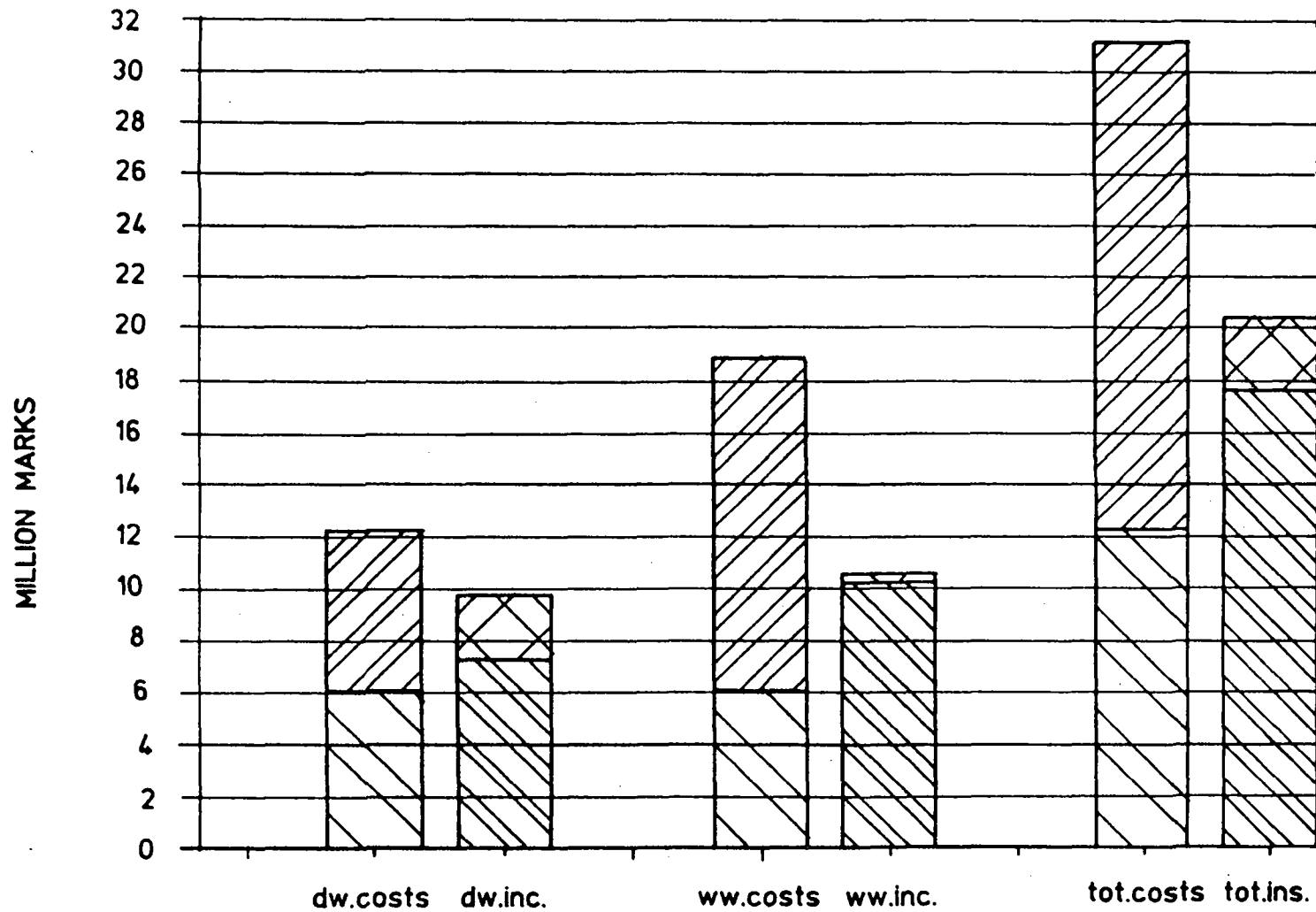
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Korttelialu

ja rakentam

paikoitukse

CITY OF HYVINKÄÄ WATER AND SEWAGE WORKS



COST AND INCOME STRUCTURE



ECONOMY

Water works:

Expenditures

-interests and amortizations	49%
-salaries and other personnel expenditures	33%
-operation of pumping stations	7%
-maintenance of pipelines	7%
-others	4%

Incomes

- water rate incomes	74%
- water meter rents	3%
- other incomes	23%

Cashflow calculation:

cash income	9,8 mill.mk
running costs	-6,2 mill.mk

cash surplus	3,6 mill.mk
investments	-3,1 mill.mk

income surplus	0,5 mill.mk
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ECONOMY

Sewage works:

Expenditures

- interests and amortizations	68%
- personnel costs	4%
- operation of treatment plants	20%
- maintenance of pipelines	5%
- others	3%

Incomes

- waste water rate incomes	97%
- other incomes	3%

Cashflow calculation:

cash income	10,6 mill.mk
running costs	- 6,0 mill.mk

cash surplus	4,6 mill.mk
investments	- 6,9 mill.mk

income deficit	-2,3 mill.mk
----------------	--------------

DISCUSSION *

Mr. Demissew:

How do the new houses connect? And who pays the high cost of the main pipe? Especially when new houses are built later on and some of the plots have no direct access to the road and the main pipe?

The Reporter:

They all connect directly to the main pipe. In vacant areas meant for construction, connections are made ready for each lot in advance, even if the lot is still without a house. It is cheaper to build everything at the same time.

Mr. Singano:

Do these high rates for sewerage (even higher than those for drinking water) not discourage the users to connect?

The Reporter:

It is a difficult political question. In Finland it is compulsory.

Mr. Morange:

In France house-owners have two years to connect to municipal sewers but lack of money makes it sometimes difficult to implement the policy. The municipalities generally have too low sewerage charges which cannot cover the inherent costs. It is a problem in the long term.

The Reporter:

Neither here. Other financial sources are necessary to cover the costs of sewers. It is also difficult in Finland.

Mr. Hermunen:

It is a pure political question to decide who pays: the consumer directly or society.

Mr. Skyttä:

If one considers the depreciation, what is then the rate of return? You showed your cashflow, but is there any limit in Finland for municipal support to water services? In such cases as in Hyvinkää where all inhabitants are not connected these persons pay for the others via taxation!

The Reporter:

There is undoubtedly a deficit, but the law does not even oblige the municipality to collect any charge from the consumer for water and wastewater services, it can be totally dependent on the general budget. (The law allowed municipalities to charge for wastewater only after 1974, note of the editors).

*) The statements by participants are only slightly modified to preserve their authenticity as far as possible.

Mr. Vikman:

In Finland the Government has participated in the financing of water supply and waste-treatment since the early 1950's. Nowadays this participation is limited to investment cost, and its share is about 10 % of the total annual costs. If we consider that investment and operation costs are equal, the Government subsidies represent only five percent of the sector finances.

Within each municipality, the politicians decide whether municipal taxes or water charges will cover the service.

Mr. P. Rantala:

It seems difficult for the waterworks to ask for more money from the city if its budget shows an increase in the cash flow. The aim of the calculated scheme proposed by the Association of Finnish Cities is to show a cash flow balance: no surplus, no deficit. Unfortunately, the lifetime of the pipes used in the calculations is about 30 years. But in practice the investment rate is lower, so that pipes should last 400 years to be renewed with financing. This causes the political discussion concerning the water rate.

The Reporter:

Only the general planning. The other departments do the detailed planning, and the construction. The water and sewage works takes care of operation, maintenance, and general planning.

Mr. Morange:

Was the water network from the beginning in the hands of the municipality? How willingly do people connect to the system? What is the rate of connection?

The Reporter:

Hyvinkää is a new city, and from the beginning the waterworks has been owned by the municipality. It was quite natural that everybody was connected to the service - 100 % in the city itself. Only in the countryside do some non-connected houses exist. The total rate of connection is 91 percent.

Mr. P. Rantala:

There is a law, which forces every household within the planning areas to be connected to the networks.

The Reporter:

But there is one addition to this law: depending on economic conditions.

Mr. P. Rantala:

Yes, but the planning area itself is limited in such a way that it is economically feasible.

Mr. Seppälä:

Concerning income structure, are you still collecting a fixed connection fee from new consumers?

The Reporter:

We never have used any connection fee. They are typically not used in bigger cities in Finland.

Mr. Skyttä:

Do your waterworks have any responsibility over the water quality of the 9-10 % of non-connected users?

The Reporter:

There is no requirement, only an inspector checks the standard of the new buildings under construction. If someone wants to check the water quality, the laboratory of the works can make the analysis for a special charge.

Mr. Vikman:

The municipal health board is responsible for the monitoring of water quality.

Mr. M. Rantala:

Nowadays, the water departments collect their revenues mainly from the consumers. Has this changed the relationships with the municipal political board?

The Reporter:

There has not been any actual change except in the way the money is collected. The waterworks are basically only "technicians" but the politicians decide.

Mr. Hukka:

Is there any discussion concerning change of the status of the department in Hyvinkää (privatization, more independence..)?

The Reporter:

The aim is to cover fully the costs although the municipality has other possibilities. Still it is its aim. Providing sewerage is more expensive than providing water supply. The principle is to collect the costs from those who pollute. Water consumption decreased after the sewerage charge was introduced.

DEVELOPMENT OF CONSUMER INITIATED AND MANAGED WATER SUPPLY COOPERATIVES IN VIHANTI

by Mr.E. Kotila,
Managing Director, Vihanti Water Company

1. General background

The Commune of Vihanti is situated in Northern Ostrobothnia about 70 km south of Oulu (Appendix 1). It has approx. 4000 inhabitants of whom less than a half live in the main village of Vihanti and the rest live in other rural villages and dispersed rural areas. Vihanti is a typical rural commune even though the mining industry, carried on for over 40 years, has had its impact on the economy of the commune (Appendix 2).

2. Water supply organizations in vihanti

The first network of water pipes and sewers in Vihanti was built in the mining village of Lampinsaari while mining activities began in the early 1950's. The water supply system of Lampinsaari has been owned and maintained by the Outokumpu mining company.

Organized water supply began elsewhere in the commune in 1957 when Vihanti Water Cooperative was established. The initiators of the Cooperative were some inhabitants of the village. One of the initiators, Mr. Jaakko Kotila, an 87 year old gentleman, is still a member of the cooperative's board.

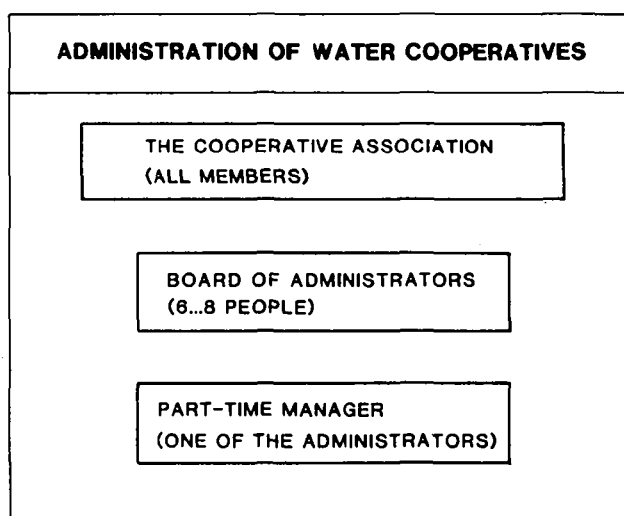
Later on, mainly in the 1960's water supply cooperatives were established in different parts of the commune so that nowadays the total number of independent cooperatives is thirteen. Three of the cooperatives, including Vihanti Water Cooperative, are of a bigger size (between 100 and 500 joined households) and the rest of them are quite small (from 5 to 50 joined households). The rural Village of Alpua has seven independent water cooperatives. Four cooperatives have their own source of water supply, the rest draw water from the mining company's water supply system.

The main difficulty in establishing water cooperatives has been in finding charter members. For instance, when the Vihanti Water Cooperative was established there were only 28 charter members while building costs were millions of marks. The initiators did not let that stop them and started construction work and after having proceeded so far that the first households could be connected to the network, there were no more problems in getting more members to join the water cooperative.

When establishing water cooperatives one of the principal problems is to find a suitable water source. In Vihanti that has never been too difficult due to the ample resources of ground water.

3. Administration of water supply cooperatives

The administration system of water supply cooperatives consists of a board of administrators elected yearly by the cooperative association. Each member has the right to participate in the annual meeting of the cooperative association. The board of administrators decides the charges and dues as well as fees for joining the cooperative and takes care of the finances of the cooperative. As a rule one of the administrators especially in small cooperatives, acts as a part-time manager. His duty is to take care of construction and maintenance tasks. The administration of water supply cooperatives is shown in the figure below.



4. Some statistics of water cooperatives in vihanti

Ilveskorpi is a typical rural village in the southwestern part of Vihanti (Appendix 3). The area of Ilveskorpi has approximately 400 inhabitants. People earn their living mainly by dairy farming. Ground water in the area is scarce and often of bad quality.

The Ilveskorpi Water Cooperative was established in 1966. There were twelve charter members. The cost of the water supply system was about 250 000 marks consisting of the waterworks and a network of pipelines about 22 km in length.

When the construction of pipelines and the waterworks was finished in 1970 the Water Cooperative had about 50 consumers as members. The costs of construction were financed by government subsidized loans and joining fees.

Today the Ilveskorpi Water Cooperative has 105 members. The water charge is 1.20 FIM/m³ whereas in an additional annual fee of 100 mk per household. Nowadays the cooperative has pipelines with a total length of 35 km. Water consumption is about 250 m³ per household per year. The cooperative has 65.000 FIM in outstanding loans.

The corresponding data of Lumimetsä Water Cooperative are: established 1975, members 120, watercharge 2.00 FIM/m³ (initially 3.50 FIM/m³), annual fee 200 FIN a year per household, total length of pipelines 53 km, outstanding loans approx 500 000 FIM.

Today almos 100 % of the households in Vihanti receive piped water. Daily domestic water consumption in the commune is now approx 800 m³.

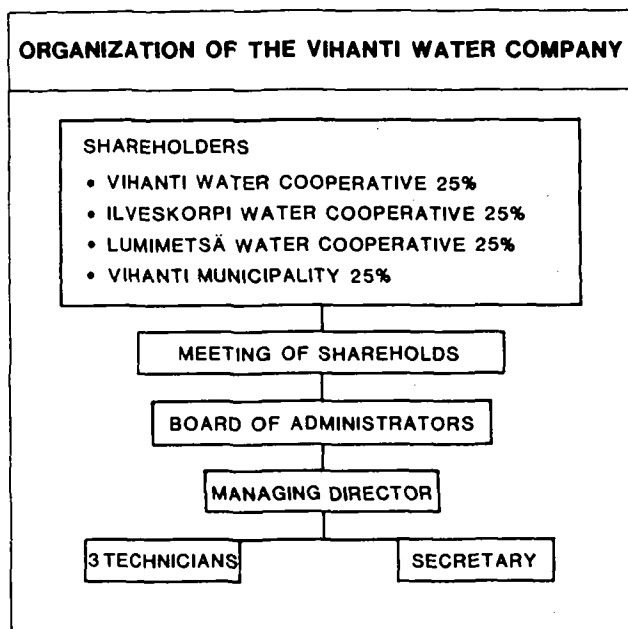
5. The Vihanti Water Company

The groundwater reserves in the area of Vihanti have been identified by assessments equivalent to daily consumption of approx 20 000 m³. The groundwater reserves are located in a long esker chair running across the commune.

Because of the large groundwater reserves there is still one water supply organization in Vihanti called The Vihanti Water Company. It is owned by a number of water supply cooperatives and the Vihanti municipality. The Vihanti Water Company is responsible for purchasing water and supplying it to local cooperatives and municipalities in the neighbourhood.

The Vihanti Water Company was established in 1978 and now has contracts to supply the water cooperative of Vihanti the municipalities of Merijärvi and Pyhäjoki, the towns of Raahe and Oulainen.

The Vihanti Water Company employs 4 people including the Managing Director.

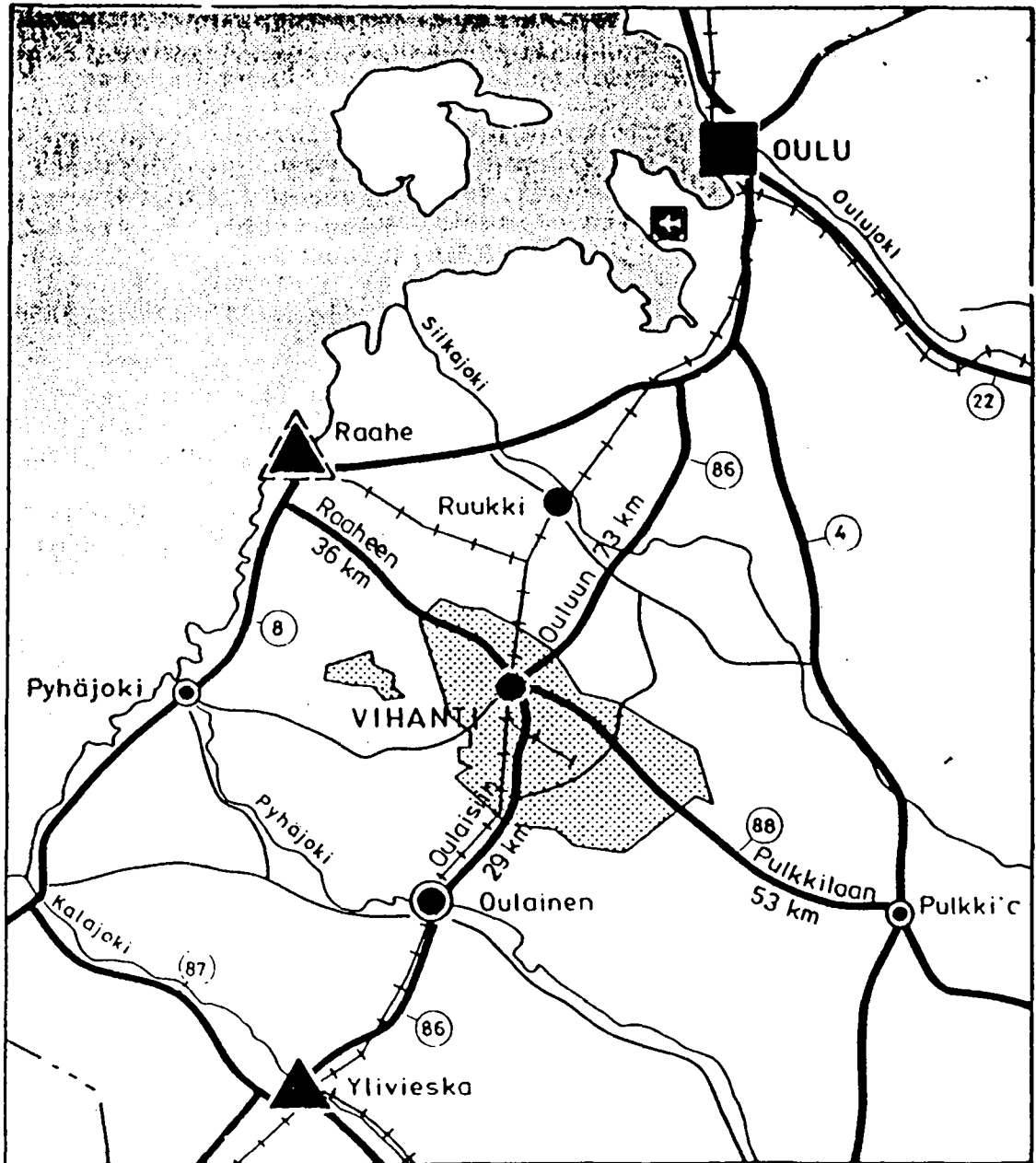


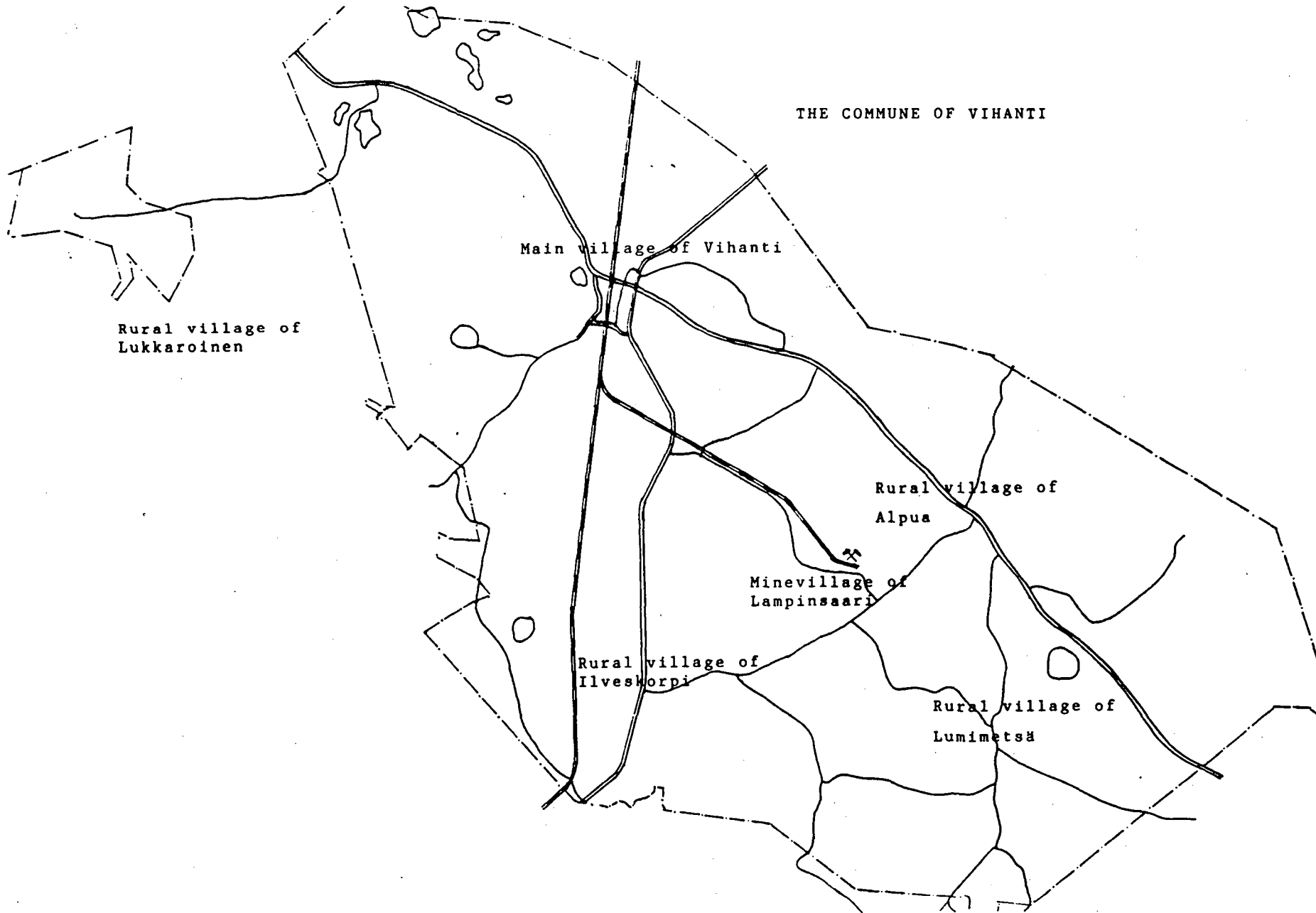
6. Summary

The development of water supply in Vihanti has depended totally upon the initiative of local people. Municipal help in financing has been very little, although municipalities have during the last few year covered 20 % of the costs of water supply investments.

Peoples' own initiative in constructing an maintaining pipelines and waterworks has helped cooperatives to keep water supply fees moderate, which has made it easier to get more members to join cooperatives.

One important reason for developing water supply in rural areas is that the dairy industry pays a better price for higher quality milk.





THE COMMUNE OF VIHANTI

Main village of Vihanti

Rural village of
Lukkaroinen

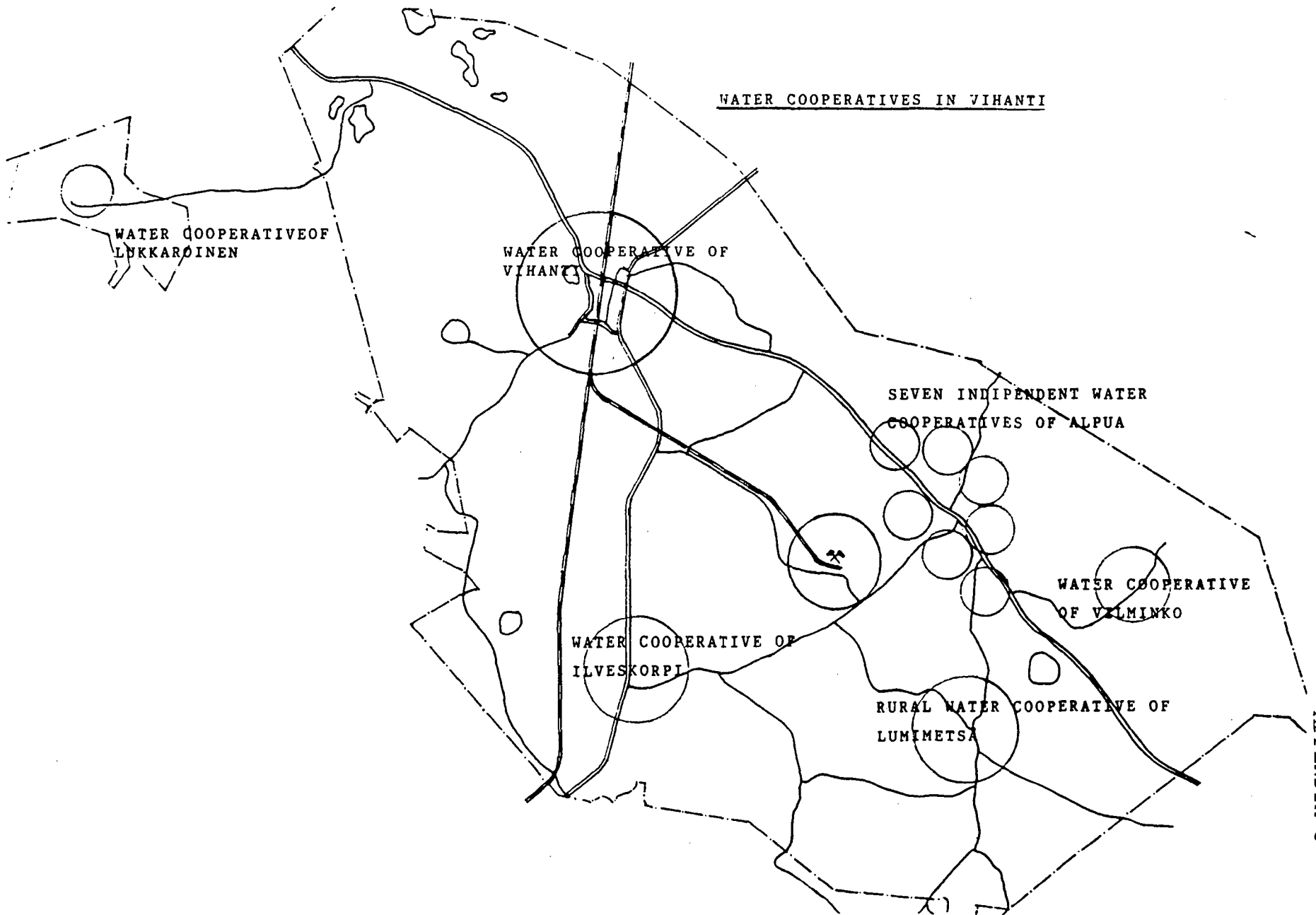
Rural village of
Alpua

Minevillage of
Lampinsaari

Rural village of
Ilveskorpi

Rural village of
Lumimetsä

WATER COOPERATIVES IN VIHANTI



DISCUSSION

Mr. Pietilä:

Did you receive any financial support from the government?

The Reporter:

The support has varied from zero (at the beginning) to 10 -15 % nowadays.

Mr. Lahtinen:

Was the governmental support in the form of grants or loans?

The Reporter:

It was loans only. Since it was a government subsidized loan, we paid only little interest.

Mr. Morange:

Who owns the land in the water supply service area? What is required to join the scheme?

The Reporter:

The registered members have to allow pipe-laying on their land. The joining fee is 4500 mk per household in Vihanti cooperative and 3000 mk in the Lumimetsä cooperative. Almost 100 % of the population is connected to piped water supply in Vihanti. The per capita consumption is a bit less than 200 l/d including water for cattle.

Mr. Morange:

Why are there so many small cooperatives in Alpuu?

The Reporter:

The mine company has four wells. The small cooperatives just built a small pipe and have bought the water from the company for the price of 1 FIM/m³.

Mr. Kelengwe

In the two schemes you mentioned, when they started the rates were high, and they have since decreased. But they still have outstanding loans, why was it necessary to reduce the rates?

The Reporter:

I think the loans are not very big. At the beginning, the members were not numerous, but many people have joined the cooperative later, so that costs can be shared by more persons, and that is why rates are decreasing.

Mr. Seppälä:

Did the cooperative members lay the pipes or did they hire a contractor. And did the size of the cooperative make a difference?

The Reporter:

The basic system was built by contractors. But the secondary pipes were laid by the members, especially in the small cooperatives when the maintenance is also provided by consumers themselves.

Mr. Lyimo:

Is it good to have all these small cooperatives, or is it more reasonable to have a bigger cooperative?

The Reporter:

It is difficult to say what is the reasonable size for a cooperative. It depends on local circumstances.

Mr. P. Rantala:

It depends on the relations between groups of people in a village. The union of two cooperatives might cause social trouble. They should feel that they belong to the same cooperative.

Mr. Lyimo:

The cooperatives have still loans outstanding and they are decreasing their rates. Is there more of a tendency for neglecting the economic side of water supply the smaller the size of the cooperative? If you have a bigger cooperative, maybe they will take economy better into account.

Mr. Morange:

If the people feel that they are part of a group and that the scheme belongs to them, I don't see any reason why they should not manage the system so well so that it works and at the lowest possible cost. But if the scheme involves groups with different interests, some mistrust might develop toward the management, some groups accusing the others of putting some of the money in their pocket or of not repairing their share. Your point relates to the theory of the "economies of scale". It stands in a mechanical unit, like a factory, but when dealing with services, the social aspect is very important and there, the economies of scale do not necessarily apply (voluntary work etc.).

Mr. Skyttä:

These villagers have the choice to stay out or to join. If they wanted, they could have decided to join the neighbours system. There must be something special, a benefit that they see, from joining another group. One reason of joining could be that they no longer have the skill to maintain their system, so they need the skill of somebody outside their group.

Mr. Mesfin:

What is the main advantage of a cooperative compared to a municipal system assuming that the municipality has a small population?

Mr. Katko:

Is there anybody willing to change the cooperative into a municipal system?

The Reporter:

There is no will for the change, since it would mean rate increases.

Mr. P. Rantala:

People are also afraid of losing control over their system.

Mr. Lehtinen:

I believe that these people do not want a municipal system: the rates are very low. The scheme is so small that there is no administrative cost. No treatment is needed for the water, nor sanitary control.

Mr. Vikman:

Take the case of 5 villages needing a centralized water system. Often the water source is close to one village and this village may be reluctant to pay the costs of transportation of the water to distant villages.

Mr. Pietilä:

The distances between villages in Vihanti are obviously one reason why there are so many cooperatives but not in Lempäälä where the 4000 inhabitants live within an area of 4 km².

The Reporter:

The length of the total municipality is 40 km.

Mr. Morange:

We are talking about the cooperation in Vihanti, but why was the water company started?

The Reporter:

In our rural municipality there exists a large formation of ground water. The neighbouring municipalities have water of bad quality and started to think of utilizing our ground water.

We wanted to prevent them from pumping our water. So the cooperatives together with municipality created this company.

The Chairman:

So it is better to control one's water and make later special agreements with the neighbours.

Mr. Hermunen:

Do you make business by selling water to other municipalities This is actually allowed.

Mr. Kotila:

No. We do not make any profit, since we have public loans?

Mr. Mattila:

Have you faced any problems with systems, in maintenance? For example, in Finland there are also cooperatives for constructing and maintaining roads. Who is paying for and who is taking care of maintenance of water cooperatives?

The Reporter:

Maintenance is not any big problem. If the need arises, the cooperatives ask the two workers of the Vihanti Water Company to help.

RECENT DEVELOPMENT STRATEGIES OF WATER SUPPLY IN SPARSELY POPULATED RURAL AREAS IN EASTERN AND CENTRAL FINLAND

by Esko Mälkki

Water and Environment District of Kuopio

Background

During the last thirty years the development of water supply in Finland has been very quick. In addition to the use of surface water, especially in the biggest cities, most towns as well as some of the densely populated villages in rural areas are supplied with ground water from esker aquifers.

In many rural areas, however, the density of population is low and topographical/ground conditions difficult for constructing water supply networks. Also, the distribution of high yielding aquifers is uneven and possibilities for using this water source are restricted.

It is estimated that about 600.000 - 800.000 people (150-200.000 private households) now living outside communal or otherwise arranged water supply, are at present faced with some kind of water supply problem. Lack of piped water or unsatisfactory water source are the main problems.

Some of these people can in future be supplied with water by traditional water supply arrangements: either with ground water or surface water of good quality. It seems, however, that about half of the people mentioned above must still utilize water from their own sources, i.e., from private wells with all the related problems.

Need for development

This fact has been understood for long but the way to solve the problems has remained undetermined until recently. It is very well known, that in geological conditions such as exist in Finland it is not difficult to find ground water practically anywhere. But the drawing of water does not always succeed by digging a shallow well or drilling a borehole because of the variable permeability conditions and the poor well technology available. Another problem often faced is water quality, especially due to iron and manganese in ground water. Man-made pollution is another negative factor.

It may easily appear that the problem is only technical. That is far from the truth. There is need to give information to people on what to do if they have water-related difficulties, for instance, in choosing the well site, the most suitable well type, on how to protect the water source, on financing possibilities etc. One important point is the developing of communal activity and water supply planning.

Recent development

Realizing the need for more R&D on the basis of the above facts, a special Project called "Development of Rural Water Supply" was started by the National Board of Waters and Environment. The main goals of the Project are the following:

- 1) Survey of present problems in water supply in rural areas and determining their causes.
- 2) Testing the use of a communal advisor in connection with the R&D mentioned above
- 3) Developing technology needed especially in small water supply units, including correct well siting
- 4) Investigating the quantity and quality of microbiological pollution in the wells
- 5) Developing water treatment technology
- 6) Developing water supply planning so that it also takes into consideration those households, which cannot get water from communal or other water supply systems
- 7) Creating cooperation between national water authorities, municipalities and private consumers; to determine the roles of each
- 8) Developing dissemination of information and training at all levels.

Preliminary results of the Project

The experience gathered during the Project indicates that this kind of activity is needed. Besides helping separate households it seems that also total costs of water supply can be diminished. If people themselves can in a satisfactory way arrange their own water supply (self-help) the need for communal etc. supply will be smaller than estimated earlier.

DISCUSSION

The Reporter:

The methods we use have been used in Tanzania since 1972. But financing for the project is not sufficient and we are forced to use less sophisticated methods.

Mr. Singano:

About the community participation in the developing countries, do you think this method could be used by us?

The Reporter:

I think that the situations in our country and Tanzania are rather different, but it is important that people in the village are active. The difference is that in most cases in Finland people make their own private wells while in your country people may build a common well. But the principle of the work is similar.

Mr. Morange:

What kind of institutional forms do you suggest? Do you let the people choose freely the structure they need to implement their project? Or do you suggest in advance a specific institution?

The Reporter:

I don't have any good answer. But I believe the people have the possibility to choose, make the decision: a common supply or a private well. But we need help from the government to help them make the right decision. We need more resources to determine the ground water deposits. We need financing, and training; the solution should be the most economical one, and it should be suggested by the people themselves.

Mr. Vikman:

Legally the municipalities are responsible for the water supply within the municipality, but in the countryside the level of their responsibility is very low. In fact, the inhabitants in rural areas are responsible for their water supply. This means that the question of consumer participation in our country is quite different because there is community and user responsibility. The method of organizing the work is important, whether it should be contracted out or done by consumers.

EXAMPLES OF INSTITUTIONAL CONSTRAINTS IN DEVELOPING COUNTRIES

by Mr. H. Vikman
Sanitary Engineer, National Board of Waters and the Environment
Helsinki, Finland

1. Characteristics of Institutional Arrangements in Developing Countries

At present, development of water supply and sanitation services in developing countries is characterized by very strong central government dominance. Extensive experience proves, however, that centralized institutions - whether public or private - have not been able to cope with the requirements, particularly in rural water supply and sanitation.

Probably due to external support to the sector development, virtually all governments in developing countries have set ambitious sectoral targets. Typically, the objectives and priorities have been set by central governments and donor agencies, not by the beneficiaries. As a result of the **sectoral approach**, many development programmes respond to needs that are not clearly recognized by the target population.

Water supply and sanitation have the nature of a **social service** rather than of a sustainable economic activity in most developing countries. The sector development, the expansion of services in particular, is, therefore, a highly political issue. While the provision of services is financed by the scarce public funds, the services can be supplied only to a marginal privileged target group, whereas the majority of the population has to cope with inadequate water supplies and sanitation facilities.

The three major characteristics - central government dominance, sectoral approach, and social service nature - are closely tied. They have all contributed to the supply-orientation in the sector instead of true demand-orientation.

2. Aspects of Central Government Dominance

The dominance of the central government in the sector has some typical consequences, e.g.:

- the private sector has had few opportunities to develop and market its services
- local authorities and communities have not been encouraged to assume responsibility
- administration is inefficient: high administration costs are often associated with overstaffing and excessive travelling needs
- consumer preferences are often ignored, which leads to systems poorly matched to users' desires resulting in ultimately underused or abandoned facilities.

Moreover, central governments have usually no charge to assume the responsibility for the provision of services in rural areas, due to limited budgets and weak institutions.

A number of ministries or government agencies are involved in the sector development, with the Ministry of Water, or equivalent, usually having the major role in water supply and urban sewerage, and the Ministry of Health in rural sanitation.

In some countries, the responsibility for construction and operation has been shared between a "water supply construction authority" and a "water supply operation authority". Typically, construction authorities receive their funds directly from the Ministry of Finance, or equivalent, not through operation authorities. This clearly indicates the political interest only in the provision of services, not in maintaining them. The responsibility of the construction authority typically lasts for a few months or years. On the other hand, the operation authority's responsibility for the schemes covers several decades.

The following example from a project review report illustrates the world-wide reluctance of top-level authorities to delegate decision-making to lower levels, and some of its consequences:

The head of the central authority is the engineer for all contracts financed by the government. The centralization issue is not specific to the Project alone. It affects all contract administration within the central authority and its regional offices. The authority of the regional level director is only USD 3.500. Centralization results in delays in awarding contracts, and limits the authority and feeling of responsibility among the officers who are in charge of the preparatory tasks and supervision of the contractors performance.

3. Limitations of the sectoral approach

Institutional development often concentrates on the development or strengthening of vertical sectoral organizations. This often leads to several organizations competing with each other in the exploitation of the limited human, physical, and financial resources. This competition has been enhanced by donor involvement. The donors have often emphasized fast progress in their projects and programmes, hardly allowing time for initiatives, responsibility, and participation of involved institutions and beneficiaries. In spite of the application of "community participation", most programmes suffer from lack of community responsibility. This tendency is illustrated by the following example from a rural water project:

The project planners proposed that villages should contribute 25 % of the construction cost of each

hand-pumped well established. It was unknown how the users would react to this approach. However, the planners wrote exact yearly production targets into their plans.

Unfortunately, villagers refused to participate under the conditions stipulated and/or with the staff operating in the field. Villages contributed cash only slowly, and the project staff could not or would not involve villagers in planning, construction, and maintenance. In the end the construction unit ended up doing everything itself without involving villagers so as not to 'severely handicap the implementation of the project'.

Furthermore, the commitment of sector authorities and project personnel to their objectives and duties, without the capability of seeing the importance of other needs, has resulted in many inconsistent judgements. The following examples are from two evaluation reports of sanitation programmes and from a report of water quality control.

The main building material for the improved latrines is burned bricks. A lot of fire-wood is needed in order to burn the huge quantities of bricks needed for the construction of one latrine. Despite this need the project area is neither endowed with substantial woodlands nor have the villages been able to establish woodlots. Most villages are located far away from the forest and are consequently dependent on lorry transport to get fire-wood for brick-making. The donor agency has allocated a lorry to the local authority to be used *inter alia*, for transport of fire-wood in connection with the sanitation project. Although the villagers have reportedly raised enough money to keep the lorry moving, difficulties in getting fuel have now retarded the transport of fire-wood for brick-making. It can be argued that this bottleneck could easily be removed if the donor agency were to increase its assistance to the villagers by providing fuel and driver's salary.

There has been a serious water shortage in the area because of the prolonged drought and breakdown of water engines. In most cases, project vehicles have had to transport water to latrine construction sites.

The limited bacteriological testing indicates that water is in most cases unsatisfactory. The relatively poor quality of the water supplied could be improved by additional chemical dosing during treatment processes, additional flocculation, sedimentation and filtration during treatment processes, chlorination at service reservoirs, regular monitoring of water quality at consumers'

premises, and adequate operation and maintenance of the distribution systems.

Meanwhile, the authority **has made** contact with the City Medical Officer, who from time to time advises consumers on the radio to boil and filter the water.

The authority **is looking** for funds in order to construct and equip its own central laboratory. Plans are also underway to improve plant laboratories. The increased testing work undertaken in future will result in large quantities of data which will need to be stored, for future reference and comparison, in a water quality archive. The use of a computer for such purposes would be desirable.

4. Beneficiaries of free services

Throughout the developing world, water supply schemes have floundered because the beneficiaries refuse to provide direct financial support, arguing that government should provide the service. The unwillingness to pay is reinforced by the fact that for many years the services were provided to the wealthy without direct charge.

The demand for free, or heavily subsidized, services is nearly unlimited. The resources for the provision of these services and maintaining them are very limited. As a result, free or practically free services are supplied to the target groups with strongest political influence. These groups rarely include ordinary peasants, who contribute to the provision of the services by paying taxes.

Donor assisted water supply and sanitation programmes often aim at providing services to the poorest of the poor living in remote rural areas. The official recipient government policies of free water have usually been adopted in these programmes. More penetrating macro-level analyses might have revealed that the recurrent costs of the programmes being launched would absorb an unreasonably large share of feasible future public budget revenues.

A typical chain of problems, created by an under-pricing policy, is presented in the following example from a country with centrally fixed water tariffs:

The annual operating costs and revenues of the water supplies, implemented by the project, are presented in Table 1.

Table 1. Annual Operating Costs and Revenues (million monetary units).

Supply	Annual O&M cost	Annual billing	Annual collection	Annual loss
Piped schemes	8.0	4.0	3.3	4.7
- house connections	6.8	3.6	2.9	3.9
- standposts	1.2	0.4	0.4	0.8
Hand pump wells	0.7	0.3	0.2	0.5
Total	8.7	4.3	3.5	5.2

Attracted by the seemingly remarkable revenues collected from house connections, the operating agency is in favour of higher service levels. As the demand for house connections, due to low tariffs, grows, the capacity of the supplies will be lower than demand. The operating agency is planning to solve capacity problems by intermittent supply. This will directly reduce standpost consumption. Those served through house connections will, most likely, safeguard sufficient supply of water with their overhead tanks.

The figures in Table 1. indicate that, in this donor assisted project, properties served through house connections receive a generous annual subsidy of 430 monetary units, whereas households served through standposts are subsidized with 110 monetary units annually.

5. Institutional Alternatives?

As central government dominance, strictly sectoral approach, and provision of subsidized social services are the key features of the present institutional arrangement in the sector, they also represent the major institutional constraints. Sound sector development would be more realistic if the key words were community responsibility, demand-orientation, and economic sustainability.

Requirement of a substantial contribution in cash or kind from the beneficiaries, combined with community-based responsibility for implementation and operation of services, would likely create a balance between the demand for improvements, expressed in willingness to take responsibility, and capacity to provide supply. This, in turn, would help in assessing the priority of the water

supply and sanitation sector among other sectors, and in prioritizing individual water supply and sanitation schemes.

The emphasis of institutional development should be on assisting the local communities in accelerating the development process, not in any particular sector but based on their own priorities. Water supply and sanitation should be seen as one of the sectors in this development process.

DISCUSSION

Mr. Morange:

Is there not a need for a national structure, and what link do you propose between this and the community level?

The Reporter:

Consumers or communities should take the initiative and it should be among the first needs on their priority list. Currently the targets are set at a very high level and the term "community participation" indicates very well that communities have been persuaded to collaborate, even in projects that have a good reputation.

Mr. Skyttä:

A little comment: you talk about the difference between community participation and community involvement.

"Participation" indicates that there is pressure from outside: money is available and then pressure is put on the community. "Involvement" indicates more that it comes from the community.

Mr. M. Rantala:

The key issue in most of these cases is the community or consumer-managed system so that in the long term the funds to run the system must come from the consumer and not from the government budget. I know also the case of the village of Simana that you mentioned; the above was true there from the beginning. The only problem occurred in 1982 when no fuel was available, even for money. And there are many other schemes of this kind, so that in Tanzania water supply could be easily provided by self financing. It is just a question of how it can be organized?

Mr. Demissew:

You are a statistician, maybe your ideas from the villages will work, but if you go to Africa, there are, for example, the nomads. These people do not know anything about technology. But the government and the local authorities believe that improved water supply is needed. The local authority tries to convince them of the advantages of improved water supply. I think in this kind of situation the government has to do something for these people.

The Reporter:

If there is no demand, it has to be generated, for instance by social marketing or an education campaign. But the services should not be arranged before there is a demand.

Mr. P. Rantala:

If there is no need, is there any need to do anything? If people do not feel the need of water, what do they do with all kinds of institutions or arrangements to get water?

Mr. Hukka:

It means that they had a kind of water supply anyway, and are not dying of thirst.

Mr. Kotila:

I would like to ask: is it possible for villagers to organize cooperatives in African villages?

Mr. Demissew:

In Ethiopia it is possible, depending on the kind of committee they form.

Mr. Pietilä:

They can form a committee, but can they proceed further?

Mr. Demissew:

No, one obstacle is the thinking. Another is the individuals' income. These two things are combined.

Mr. Morange:

I would like to ask Mr. Kotila, of Vihanti cooperative, why did the need for a water pipe suddenly become so strong, that it was built, after hundreds of years without any pipe? Why did the people start to develop piped water.

Mr. Kotila:

In Vihanti they built it to improve their living conditions.

Mr. Morange:

But this morning you told us about the milk production.

Mr. Kotila:

Oh yes. The people are milk producers. The dairy started years ago to demand a higher standard for the milk, and pay more for milk that contains less bacteria. Thus it was an economical incentive.

The Chairman:

They pay better for milk without bacteria, so that it becomes an economical factor forcing them to this development.

The Reporter:

In Vihanti, there was no one providing this service freely, so that the only way was to create cooperation to provide the solution. But in many countries somebody is providing free services to some privileged people. When speaking about affordability it is usually understood so that individuals cannot afford these services. However, it is often forgotten that the government cannot afford to provide of this service and if they are provided free of charge they can reach only a small portion of the privileged people in the nation. In this situation it is difficult to establish cooperatives because of this lottery, because people believe or want to believe that maybe "we are the ones who will get the water free of charge".

Mr. Demissew:

In societies using their traditional sources which are polluted, do not you think that the intervention by some organization is necessary? If you wait till the demand will rise, the population vanishes from the area.

The Reporter:

People should also demand quality, the demand for quantity does not suffice. I know places where people still use the polluted source even after the wells have been dug, because it tastes better. Health education is really important.

Mr. Mattila:

I talked with one of the municipal water advisers (a new profession, created some years ago by some rural municipalities - editors) in Leppävirta, eastern Finland. He said that at the beginning he had to advertise his services. It took a long time before people believed that he is really the person that can help them. After some people received excellent water thanks to him, the demand was created and everybody wanted him to come.

Mr. Katko:

There might exist some rural areas where there is no demand, but the existence of the water vending systems which provide water at an extremely high price shows that there exists a demand for expensive water. But the real question is: are water engineers able to provide these services that consumers will trust and are willing to pay for?

Institutional Development Needs in Sub-Saharan Africa

T. Skytta, Principal Sanitary Engineer, the World Bank. *)

I Introduction

1. Satisfactory institutional performance, defined as the ability of an entity to carry out successfully a predetermined task or goal, is influenced by a variety of conditions; some, such as deregulation, are external to the institution and reflect the economic environment at large, generally beyond the influence of the entity; others as accountability and incentives, are within the purview and control of institutional management. Irrespective of their nature, managerial or operational changes designed to improve performance must, if they are to succeed, have the following essential and interrelated features (by Armand Van Nimmen of EDI/the World Bank):

- (a) Commitment; Commitment by top management is the foremost requirement for improved institutional performance. Commitment by a single individual or entity although commendable is often not enough. To filter through the ranks and be truly effective commitment must be shared by all managers and by all agencies involved in an operation; this commitment in turn reflects the determination of a country's leadership to a given policy. By its nature, commitment evolves over time, changes with individuals and varies with the task at hand. It must, consequently, be nurtured and tailored to meet the demands of specific operations or institutions.
- (b) Participation; When institutional management plans, designs, and implements a program or task, its commitment to do the job increases. The degree of participation and attendant responsibility are then measures of success. Similarly, institutions are likely to adopt and implement reforms successfully to the extent that they are convinced that they themselves have forged new policy directions and, therefore, have a stake in their outcome.
- (c) Specificity of Task; The more specifically and clearly a task or program is spelled out, the more likely it is to be carried

The paper presents the views of the author and not necessarily those of the World Bank.

out satisfactorily. From the institutional to the individual level, clarity of objectives and methods ensures that performance can be monitored. And monitoring leads to accountability, a strong incentive towards increased motivation and strengthened commitment.

- (d) Time and Labor; There are no quick remedies to improved institutional performance -- the process is lengthy, labor intensive and delicate. In fact, quick results are to be viewed with scepticism because we know that any change altering the status quo will disrupt some vested interest and will be, to some extent, resisted. A specialist dealing with these issues must sharpen his/her skills in listening to, persuading and negotiating with the client institution.
- (e) Realistic Objective; It is important to ask what is possible to achieve and, accordingly, set goals that can be realistically attained. If an institution is to generate enough vigor from initial reforms to carry out subsequent changes on its own, these first innovations must work. Objectives must therefore be well defined and carefully thought through, although not necessarily simple to carry out or limited in scope.

2. The water supply and sanitation service coverage is still unacceptably low in Sub-Saharan Africa (45 countries with a total population of over 450 million in 1985^{*)}) It is estimated that about 50% of the total urban population have access to reliable water supply (ranges from 35% to over 90%). The service coverage (access to reliable supply) in rural areas is estimated to be in the order of 15% (ranges from 6% to 55%). Sanitation coverage is estimated to be well below the above figures. Some estimates show that in order to just keep pace with the population growth an initial investment of US\$900million per annum is required; this means that the current level of investments needs to be almost doubled. If the target would be set, by the year 2000, to increase the coverage (say to 90% in urban areas and 50% in rural areas) and rehabilitate the existing facilities i.e. gradually improve the operation and reliability of the systems, another threefold increase of investments would become necessary. It is clear that this level of operation would require major reform of institutional capacity in the sector.

II Institutional Issues in Rural Water Supply and Sanitation

3. The World Bank has recently carried out reviews of various rural water supply and sanitation (RWSS) programs (although the Bank itself has limited involvement and, therefore, limited experience in RWSS operations). The overall conclusion are that:

- (a) In general, the institutional arrangements used in the past have been wrong;
- (b) Technologies applied have been inappropriate for local conditions; and

^{*)} see table 1

- (c) no realistic and meaningful cost recovery policies have been practiced.

The above has undermined the sustainability of new schemes and, therefore, many of the facilities do not provide the service they were designed to provide. The following discussion highlights the key institutional issues that are crucial for improved implementation and operation of RWSS systems.

Delivery Systems

4. In many African countries, provision of water supply and sanitation services (among others), is the legal responsibility of the local authority (town, village, district council). Rural communities, however, generally do not have the financial, technical or organizational capacity to perform this role. As a consequence, governments have created a variety of usually centrally controlled mechanisms (ministries, semi-autonomous institutions, regional authorities, etc.) to provide services. Some of these arrangements have had a modicum of success, more often services have remained at an inadequate level.

5. The reasons for this lack of success are many and often reflect government preference for centralized, state controlled activities. Staff prefers to remain in urban areas where living conditions are attractive. Private enterprise has been discouraged from developing rural activities. As a consequence, both competent staff and access to spare parts is missing in rural areas, resulting in a high incidence of malfunctioning and abandoned facilities.

6. The solution to this problem of service delivery is for outside institutions to support the community, not to replace it. This requires that the centralized institutions first deconcentrate their functions to make themselves more accessible to the rural community; eventually resulting in decentralization which places the responsibility of providing services on the community. Several African countries, among them Botswana, Burkina Faso, Lesotho, Malawi and Mali, have successfully implemented such decentralization while others, such as Kenya and Tanzania, are in the process of doing so. The central government should maintain the support role; a local entity to implement and carry out O&M. Concurrent with this deconcentration/decentralization should be an effort to encourage the private sector (local mechanics, water associations, cooperatives, entrepreneurs, manufacturers, NGOs, etc.) to provide operation and maintenance services and spare parts. Project planning is already frequently provided by private consultants but implementation support for construction work by the rural community may require new "partnership" arrangements between community and private entrepreneurs.

Human Resource Development

7. Among the greatest challenges facing water supply and sanitation agencies, particularly those serving rural communities, is the development of a sufficient human resource base. This requires not only appropriate training but attractive career opportunities and

adequate salaries, including incentives for staff stationed in rural areas. This is particularly important at a time when the organization is deconcentrating or decentralizing its functions.

8. Traditionally, sector staff is receiving technical training. RWSS development, however, requires additional skills in social sciences and public health. The responsible institution must therefore attract professionals of other (non-technical) disciplines to form the necessary multi-disciplinary teams as well as train its own staff to be responsive to the concerns of the rural community. Working with NGOs will also place additional burdens on staff. Increased RWSS activities will therefore have to be accompanied with appropriate training programs and policies to attract and keep competent staff.

Community Management

9. Sector literature is studded with references to communities' inability to maintain RWSS facilities, even the simple handpump. The explanations given are either faulty technology (too complex or inappropriate for the conditions) or lack of interest by the community. The former problem can today be overcome by sector professionals, the latter is ascribed to a lack of community participation which, in extreme cases, leads to the attitude: the government built the facility, the government owns it, the government should maintain it. The attitude is understandable from a community who is not necessarily convinced of the need for and benefits of RWSS, or the appropriateness of the project's design. Clearly, the community must make its own assessments of needs and priorities. The community's decision should be respected; if negative, further outside efforts should be restricted to education and provision of information. RWSS facilities not demanded and approved by the community should not be built. Care must be taken, however, that an expression of interest represents actual construction, the making available of land and facilities, etc.

10. Sector literature also reveals that facilities built by the community with NGO help following intensive and lengthy information/education activities are more successfully maintained. Larger bilateral projects undertaken with the help of intensive technical assistance also tend to show reasonable results in the more recent past although not reaching the success level of NGOs. The massive input of resources in RWSS project preparation required makes expansion of NGO and even bilateral efforts difficult. Multilateral organizations could help by means of sector loans or sector policy adjustment loans, using Bilaterals and NGOs as "executing agencies" to perform project preparation field work.

Intermediation

11. Rural communities do not have the administrative infrastructure which would allow them to directly deal with External Support Agencies (ESAs), provide credits to users, purchase goods and spare parts or contract services nationally or internationally. Similarly, they usually do not have the means to ensure that extra-sectoral needs vital to RWSS success are met. Although the communities

must manage their own RWSS efforts, they do need intermediaries to help them: an intermediary support structure is required. The important thing is to avoid complicated coordinating mechanisms and to ensure that the community knows of and has access to the nearest representative of the organization it needs to deal with. The community knows better when and how it needs help than a far away coordinating group. Among the arrangements could be:

- (a) A regional authority or association, for example a water and sanitation authority (urban or rural), could be the major channel of assistance;
- (b) The district office of a ministry responsible for community development could be the coordinator;
- (c) A NGO, rural development or similar, could assist at the local level and train community leaders (e.g. water committee) how to obtain the services they need and assist them in doing so; and
- (d) A bank or savings and loan facility, (or a cooperative) could set up a revolving fund scheme to channel external and national resources to the community and receive funds collected by the community.

Non-Government Organizations

12. Non-government organizations have a long history of mostly successful work with communities in water supply and other development efforts. Among the variety of organizations are those international in scope. Others are national or even local. Some are independent associations or cooperatives, some affiliated with religious movements. Some raise their own funds (both within and mostly outside the community to be served) and prefer to have no ties with official donors, others accept financial support from ESAs. In general, NGOs:

- (a) are involved in many small projects;
- (b) have staff on site (often volunteers) which work closely with the target audience and train them by example;
- (c) provide funds for their activities on a grant basis from resources raised externally, but often require contributions from the beneficiaries for financial reasons and to test seriousness of demand;
- (d) tend to emphasize assistance to the least prosperous, those who clearly cannot help themselves; and
- (e) work at the community set pace rather than pressing to meet project imposed deadlines.

13. NGOs clearly have experience and abilities in areas where multilaterals (the World Bank; regional development banks) and even government agencies have, at best, second hand experience: organization

and implementation at the community level. On the other hand, NGOs are usually working at a scale too small and at a pace too slow to have significant impact on national service coverage or the transfer of funds, which are among the objectives of governments and multilateral or bilateral ESAs. However, if cooperation between NGOs, governments and ESAs can be strengthened, more rapid expansion of services is achievable through the scaling up of NGO activities with ESA funding (e.g. the World Bank has established a special operational guideline for dealing with NGOs). For this to happen, the legal basis for cooperation and fund transfer would have to be created and funds made available by ESAs wishing to delegate project development and implementation tasks to NGOs. Similarly, legislation empowering communities to contract NGOs and the private sector to undertake RWSS activities on its behalf will be required in most countries.

Bilateral Organizations

14. Industrialized countries provide assistance through a variety of bilateral organizations. Some of them provide both investment funds and technical assistance, others concentrate on one or the other. Often they reflect the objectives of their governments in the choice of countries and policies followed (tied aid). During the last several years, stimulated by the International Drinking Water Supply and Sanitation Decade (IDWSSD), a significant convergence of policies has taken place. Although the emphasis may vary, policies tend to favor cost recovery for the long term through user charges; service to the underserved (or unserved); and community participation and hygiene education. Given this apparent agreement on fundamental policy issues, it should be possible by all ESAs active in a country to agree on a sector plan and to ensure that their activities are complementary. For example, technical assistance agencies could undertake HRD and institution building activities as a precursor to investment projects financed by other organizations.

Women's Role

15. Major efforts are being made to respond to women's needs and to engage them as active partners in sector projects, although too often women are still perceived as beneficiaries of project services rather than as providers. Projects should treat women as providers of health related services at the household level, which makes them the principal partners in community managed projects. With or without projects, women are responsible at the family level for water supply; environmental sanitation; hygiene training; and health care: among many other tasks.

16. Whatever the socio-cultural environment, women should participate in the development of water supply and sanitation services. They should help choose technology, participate in hygiene education activities, help decide cost recovery issues. Wherever possible, women should also participate in operation and maintenance. As the "carriers of water" they have a great incentive to ensure the service functions without interruptions. Where men spend part of the time away from home working elsewhere, operation and maintenance of necessity becomes

women's responsibility. Where women are a household's "treasurer", or where they have their own income, they exert major influence on a families' willingness and ability to pay. Therefore, women should be involved in technology selection and project implementation; facilities management (operation and maintenance); financial management; and hygiene education.

III Institutional Aspects in Urban Water Supply and Sanitation

17. The direction of needed reforms and improvements of water supply to urban areas are generally well understood. In most countries, the institutional arrangements are also in place (utility approach) and acceptable. The same applies to the technological options available, and their suitability to meet the demand for services, including gradual upgrading of services as the demand increases. The obstacle for achieving sustainable results is still, however, the generally weak institutional performance, probably caused mainly by the weak management of water supply and sanitation utilities, be they municipal or parastatal agencies. This in turn causes poor performance in revenue collection (main defaulters are often the government departments) leading to low level of maintenance (or total lack of it), and deterioration of existing facilities and, as a result, worsening reliability of service.

18. The situation described above is still commonplace and many solutions to solve the problems have been tried. Often a Project Implementation Unit (PIU) has been established to at least ensure timely implementation of the project. This approach has not, however, provided a long term solution. It has been difficult to attract high caliber staff and maintain their work motivation without salary supplements and other incentives that are frequently offered to the special project staff of PIUs. Various types of technical assistance (TA) arrangements have also been tried, often with less than satisfactory long term results, especially if the training of the national staff was not adequately addressed. Best TA delivery results have possibly been achieved through twinning of similar organizations together with the appropriate use of expatriate and/or local specialists. One interesting approach was used in a project recently appraised by the World Bank in Kenya (Nairobi III Water Supply Project) which comprised a pre-investment program through an engineering credit that focused on institutional strengthening in an integrated manner, including training, cost recovery aspects, rehabilitation of systems, etc. In this case, after a program of 2 to 3 years, the institution (municipal department) was in a much better shape and ready to embark on a large scale effort to augment the supply and distribution systems. AfDB has also recently taken special efforts to improve its water sector support and is in the process of preparing a Sector Strategy Paper which emphasizes institutional strengthening of sector agencies. In the following, some ideas on key financial operations (budgeting, accounting and auditing, land and property registration, and pricing and subsidies) are summarized (based on a Bank internal presentation by Randolph Andersen, Principal Financial Analyst, AFTIN).

Budgeting

19. Success in sustainable cost recovery is possible in Africa today and in the medium term, but it has to be worked for and worked at slowly, painfully and realistically. One of the key areas for improvement in the water sector is budget preparation, approval and control, which is very much tied in with financial accounting and reporting. There are still many examples of budgets being old fashioned administrative cash budgets which fail to have regard to accruals concepts, but most notably fail to provide for depreciation of assets (many entities fail to ensure that assets are properly valued to reflect the changes in import costs due to foreign exchange rate adjustments). These understatements of costs also lead to inadequacy of pricing and, therefore, of cost recovery.

20. Budgets are often structured without regard to real physical needs or to a particular level of service. Very often the approach is last year's budget figure plus something perhaps equating to inflation. Usually budgets are inflated unrealistically because it is known that they will be trimmed at some stage in the process. It is necessary to work harder to take budget decisions for water utilities out of the political arena as far as possible and to make them more realistic by associating them with well conceived plans and monitorable performance measures. Systems are also required to ensure that the budgets can be monitored from accounting data and to provide variance reporting. For such a system to be successful, the annual recurrent or rolling capital budgets must be approved ahead of time, before the financial period begins. Often budgets get finally approved only several months after the start of the fiscal year and often with delayed tariff increases as part of the same package. This is becoming the norm instead of the exception and it demands increased attention by the concerned authorities.

Accounting and Auditing

21. Satisfactory budget preparation and budgetary control systems go hand in hand with another cross sectorial issue of financial accounting and reporting. An adequate information base is necessary in all water supply organizations; management must be kept informed, with reasonable accuracy and promptness, of the results of the actions and decisions taken. The need for improved monitoring and control of processes and enterprises has become increasingly apparent to African countries in general. At the time of project preparation, the absence of information on numbers becomes critical. Often artificial financial statements are developed without tackling the fundamental problems of the regional or national supply of accountants, accounting technicians, training, accounting standards and accounting systems. These problems will, however, neither go away nor take care of themselves. Their resolution, as with most institutional development issues, is manpower intensive, requiring an adequate number of financial analysts in the establishment.

22. Traditional audits are important from the accountability and probity aspects, but the attention should be shifted to management,

operational and value for money audits. In these times of constrained resources, it is no longer appropriate to be urging organizations only to increase tariffs. We have to help them look at opportunities for reducing costs or permitting the private sector to participate as has been done successfully for example on some bus routes, a concept that is now emerging in the water sector. But these organizations have to know how to structure their accounting coding and cost allocation systems to be able to derive unit costs and other management accounting information, which will help them prepare sound arguments for tariff restructuring or increases as well as for reducing costs and improving efficiency. It is not adequate to appoint consultants to undertake such exercises and expect improved systems to be implemented without the organizations first having been strengthened in the management and accounting cadres.

23. As well as tightening up on recurrent cost control through improved budgeting and accounting systems, considerable improvements need to be made in billing and collection systems if cost recovery is to be at all successful. Billing is often less than 100% of beneficiaries and collection rates are often abysmal. Although money leakage will always take place on uncontrolled cash on demand services, minimal control procedures such as numbering and dating of bills at the point of the transaction should be enforced with supplemental spot check supervision. On the spot cash deals with meter readers or illegal service layers in water utilities and municipal property valuers are somewhat more difficult to detect, but not insuperable. Accounts receivable are reaching alarming proportions in many organizations. Again, it is not satisfactory just to tell them to correct the situation, rather it is necessary to spend more time looking at the collection procedures and more particularly debt recovery constraints, and especially the Court systems that prevail in many African countries.

Land and Property Registration

24. All infrastructure agencies, such as Water Supply and Sewerage Authorities, etc. are involved in land and property in one way or another. For some, such as municipalities, it is their *raison d'être* - land attracts people along with industry, commerce, and government. It has to be serviced by roads, railways, ports, water supply and sanitation services as well as housing, preventive health, education, etc. Yet, land and property registration records and systems, which are so fundamental to the development of billing and collection records for municipalities and water utilities (as well as power, postal and telecommunications authorities and innumerable uses in the private sector), in many cases either do not exist or are not up to date.

25. The establishment of a well maintained land registration system, which displays publicly and accurately the rights held in land is probably the most important policy, procedural or institutional change required in most countries in Africa. Unlike accounting systems which can follow virtually a single format, there is no single model that is suitable for land management and registration in all African countries. Land problems and issues encompass legal, financial,

technical and socioeconomic concerns. They cover many aspects of development of land including planning, settlement, regulation, servicing, building as well as land markets, acquisition and tenure and property valuation, disposition, sales and taxation. Land issues are broad based and an adequate land and property registration system supported by current maps is fundamental to so many aspects of planning for urban development and infrastructure provision that it has to be tackled head on in the project preparation process. This issue has moved from the "nice to have" situation into one of the absolute necessities if any kind of rationality is to be brought to cost recovery aspects.

Pricing and Subsidies

26. If there is in place such an adequate nationwide land and property register, as well as satisfactory budgetary preparation and control procedures supported by a good financial accounting and reporting system at the level of the organizations operating in the sector, there is a modicum of a change to achieve cost recovery. Some general principles relating to pricing and subsidies are discussed below as follows:

- (a) To achieve the most efficient use of resources, prices in the sector should reflect marginal costs. This is often difficult to achieve, in part because it is not easily understood at the government or agency level, and often gives way to pricing policies under which users are charged the average total cost of services; sometimes the two are about the same. At the level of financial performance the objective has to be to not only recover full operating costs but also depreciation or debt service and some level of contribution towards the entity's capital expenditure program. Such an objective then helps sector agencies away from Government subsidies whether by way of recurrent cost support, capital grant or equity contributions, as well as reducing borrowing requirements. The consequential unsubsidized prices enable the consumer to make choices (except in the case of property taxes) about the extent of usage of the service and the agency can more properly gauge the need and/or timing for capacity expansion and avoid wasteful investment. Price revisions often take time to be approved and building in automatic triggers should be carefully designed. Small but frequent price increases are often more palatable than large erratic increases.
- (b) What is necessary to guard against is the deliberate setting of charges far below the marginal or average cost levels. Often, this is propagated on the basis of a desire to protect the poor, when the poor either do not have access to or do not have to pay for the service anyhow. Instead, it is often the wealthier classes who benefit from the low charges or subsidies. Mechanisms can be built into some pricing policies which would protect the poor by making the tariff structure progressive. This approach would also help mitigate the affordability problem.

27. Finally, consumers would more readily accept water charges and be willing to pay for services provided if the quality of service is reliable and adequate. Therefore, improvements in pricing should be timed appropriately with rehabilitation of existing facilities and strengthening of institutional capacity so as to ensure improved service standard.

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Table 1
AFRICA REGION
WATER SUPPLY AND SANITATION
BASIC INDICATORS

Country	Population		Area		GNP per capita		Water		Sanitation		Infant	Life	Debt		Water	Public		
	million	Avg. Ann. Growth %	(000)	Density	US\$	Avg. Ann. Growth %	% Access		% Access		Mortality	Expect.	Adult Lit'cy	% Export			Disease	Invest.
							1987	1965-86	Urban	Rural	Urban	Rural						
Low-income economies																		
1 Angola	9.2	2.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		44						
2 Benin	4.3	3.2	113	38.1	300	0.2	30	15	20	5	115	50		28.8				
3 Burkina Faso	8.3	2.6	274	30.3	170	1.3	50	30	30	5	144	47		14.8				
4 Burundi	5.0	2.7	28	177.5	240	1.8	90	20	n.a.	15	118	49	35	19.0				
5 CAR	2.7	2.5	623	4.3	320	-0.6	30	5	n.a.	n.a.	137	50		9.6				
6 Chad	5.3	2.4	1,284	4.1	150	n.a.	n.a.	n.a.	n.a.	n.a.	128	46		2.2				
7 Comoros	0.4	3.5	2	212.0	380	0.6	n.a.	n.a.	n.a.	n.a.		56						
8 Djibouti	0.4	n.a.	22	16.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		47						
9 Equat. Guinea	0.4	1.9	29	13.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		46						
10 Ethiopia	44.8	2.4	1,222	36.6	120	0.0	70	5	20	n.a.	168	47	8	25.8				
11 Gabon	1.0	4.1	n.a.	n.a.	2,750	n.a.	n.a.	n.a.	n.a.	n.a.		52						
12 Gambia	0.8	3.3	11	71.8	220	0.7	n.a.	n.a.	n.a.	n.a.		43						
13 Ghana	13.6	3.4	239	56.9	390	-1.7	70	40	20	n.a.	94	54		10.8				
14 Guinea	6.5	2.4	246	26.3	n.a.	n.a.	25	15	n.a.	n.a.	133	43		n.a.				
15 Guinea-Bissau	0.9	1.9	36	25.7	170	-2.0	n.a.	n.a.	n.a.	n.a.		39						
16 Kenya	22.1	4.2	583	37.9	340	1.9	60	20	45	20	91	56	47	n.a.				
17 Lesotho	1.6	2.7	30	54.0	360	5.6	40	20	n.a.	10	106	56	70	4.2		30		
18 Madagascar	10.9	3.3	587	18.6	200	-1.7	75	10	60	5	109	54	56	27.7		7,140		
19 Malawi	7.6	3.3	118	64.4	160	1.5	70	50	50	n.a.	156	46	25	40.1				
20 Mali	7.8	2.4	1,240	6.3	200	1.1	55	20	n.a.	n.a.	174	47		14.2				
21 Mauritania	1.9	2.6	1,031	1.9	440	-0.3	n.a.	n.a.	n.a.	n.a.	132	48		17.4				
22 Mozambique	14.6	2.7	802	18.2	150	n.a.	50	50	10	n.a.	123	48	44	n.a.				
23 Niger	6.8	3.0	1,267	5.4	280	-2.2	50	30	35	10	140	45		40.3				
24 Rwanda	6.5	3.3	26	248.1	310	1.5	70	60	60	80	124	49		7.6				
25 Sao Tome & Pr	0.1	2.8	1	114.0	280	0.7	n.a.	n.a.	n.a.	n.a.		65						
26 Senegal	7.0	2.9	196	25.5	510	-0.6	60	30	n.a.	n.a.	137	48		20.2				
27 Sierra Leone	3.8	2.4	72	53.3	300	0.2	n.a.	n.a.	n.a.	n.a.	175	41		8.2				
28 Somalia	5.7	2.9	638	9.9	290	-0.3	60	20	n.a.	5	152	47	60	62.1				
29 Sudan	23.2	2.9	2,506	9.3	330	-0.2	50	25	n.a.	10	112	49	32	7.7		22,000		
30 Tanzania	23.9	3.5	945	25.2	220	-0.3	80	40	80	n.a.	110	52	79	n.a.				
31 Togo	3.3	3.4	57	57.0	300	0.2	n.a.	n.a.	n.a.	n.a.	97	52		32.5				
32 Uganda	15.7	3.1	236	66.3	260	-2.6	50	n.a.	40	n.a.	108	46	52	6.5				
33 Zaire	32.7	3.1	2,345	13.9	160	-2.2	25	5	10	n.a.	102	53		n.a.				
34 Zambia	7.2	3.5	752	9.5	240	-1.7	70	30	90	50	94	52	44	n.a.				
Subtotal	305.6		17,561	17.4								49						
Middle-income economies																		
1 Botswana	1.1	3.5	582	1.9	1,030	8.8	90	65	70	25	71	59	35	4.3		n.a.		
2 Cameroon	10.9	3.3	475	23.0	960	3.9	40	30	n.a.	n.a.	89	56		22.8				
3 Cape Verde	0.3	2.1	4	85.8	500	n.a.	n.a.	n.a.	n.a.	n.a.		65		n.a.				
4 Congo	2.0	3.3	342	5.8	980	3.6	50	10	n.a.	n.a.	77	59		39.9				
5 Cote d'Ivoire	11.1	4.2	322	34.3	750	1.2	90	40	35	10	105	52		n.a.				
6 Liberia	2.3	3.3	111	20.9	440	-1.4	n.a.	n.a.	n.a.	n.a.	127	55		6.4				
7 Mauritius	1.0	1.9	2	520.0	1,470	3.0	n.a.	n.a.	n.a.	n.a.	25	67		7.7				
8 Nigeria	106.7	3.3	924	115.5	370	1.9	60	30	n.a.	10	109	51		25.4				
9 Seychelles	0.7	0.7	n.a.	n.a.	3,190	n.a.	n.a.	n.a.	n.a.	n.a.		70		n.a.				
10 Swaziland	0.7	3.4	17	41.9	700	2.9	n.a.	n.a.	n.a.	n.a.		55						
11 Zimbabwe	9.0	3.7	391	23.0	590	1.2	80	30	80	20	77	57	70	n.a.				
Subtotal	145.9		3,170	46.0								59						
TOTAL	451.5		20,731	21.8								54						

Sources: WDR 1988; World Bank Sector Reports, Appraisal Reports, WHO Data, Field Data Collection, World Bank Atlas 1988.

DISCUSSION

Mr. Demissew:

Where there is no water available and the source is very far, what do you do?

Mr. Vikman:

No answer. I will ask the following question: if all resources are very far from the village, doesn't it prove that water supply was traditionally no priority in this place? In Finland, before construction starts, the first thing that people check is the well.

Mr. Demissew:

If the village is situated on the top of a hill and the sources are 200 m down. If you have a water supply scheme with a pump lifting water up 200 m how will you involve the community in running this scheme?

Mr. P. Rantala:

If they are ready to pay, they have a free choice: either they pay for a pump or they walk and use their own efforts. The community has to figure out where they have water available. In Vihanti distances are long - the pipes are no problem, but somebody has to take care of the pump.

The Reporter:

The demand generation: in Vihanti the water received an economic value and they wanted to pay for the water pipes. In your village, if the time used to carry water is considered to have economic value, people will be ready to pay.

Mr. P. Rantala:

Time has an economic value only if they have something else to do.

The Reporter:

Yes, but why are they living on the top of the hill? There must be some activity there.

Mr. Hermunen:

There is certainly better work to do than carry water and therefore there is some value in the time saved.

Mr. Lehtinen:

There are clear benefits from improved water supply. Shorter distances and time savings produce clear benefits. The health aspects are much less clear, if people are used to drawing from their traditional sources. In that case there is a need for long term education. Sustainable operation and maintenance mean that systems should be sustainable in regard to costs and in regard of technology, so that people can afford them. It should be possible to use locally available spareparts in maintenance.

The Reporter:

Yes, financial and technical sustainability should be reached. Our surveys show that failed projects are those which are not sustainable. The main reasons for this are that the institutional arrangements are not correct, they do not encompass cost recovery and technical aspects. The objective of mainly better institutional arrangements means community-managed systems, the objective of which is to improve the sustainability of service.

Mr. Vikman:

Your example was typical in regard to the use of a hand-pump. A hand-pump well does not make any sense if the people do not appreciate the high water quality (hygienic) gained in bringing the water closer to the village.

Mr. M. Rantala:

In 1982, before pumping was started in Makonde Plateau, a bucket of water cost 20 shillings on the free market on Makonde Plateau. Pumping costs from Kitangari about 100 meters up represented only about 4 shillings per bucket: a big difference. People were living in this area because they felt it was healthy, no malaria occurred on the plateau. How was the community participation of the construction phase organized? There was a demand and people had money for water; pipelines were constructed by self-help, from village to village. The problem is that it is still state owned, so that water is free of charge. Some experiments have already been done to introduce water charges. The charge - 4 shillings per bucket is mentioned in the government budget but is not always available. Studies show that people are willing and able to pay that 4 shillings. Some kind of water cooperative should be organized. Maybe the supply itself could be provided by a separate company.

Mr. Vikman:

On demand generation. Baby sucking bottles formulas are commonly used even in the country side, although they are costly and unhealthy. Still people have turned to their use them.

Mr. Mesfin:

The U.N. experts come to the country, work on the master plan, and visit the country quickly. The communities' role is very small. Everything seems to be very centralized. The materials are kept in a central file.

The Reporter:

I agree that during the 1970s and the 1980s the exercise of master plan was very common, also by the World Bank. It was good for consultants and paper producers (Finland), but I have the feeling that this is not the case anymore - NGOs dare to be at the grass-roots level, work with poor communities. UNDP has financed many master plans but it has also financed handpumps... and a lot of activities decentralized from the central agencies, showing that things can be handled at the village level. It may seem centralized because World Bank and UNDP have contacts with the central governments which guarantee the loans, but the money may be channelled somewhere else.

Mr. Morange:

In most official and governmental literature, the statistics often show that only 15 % of the population receives water through "appropriate" technology. I have the feeling that in this case "appropriate" technology concerns only piped water.

Mr. Vikman:

It generally refers to the WHO standards, and means that piped water is supplied through household or standpost connections. The concept includes also handpumps. All these options are high cost technology. The low cost technology is cheap only in urban areas and is expensive in rural areas. Other technology is needed, for example, taking short steps in improving the traditional water sources.

The Reporter:

I agree, that when countries present these statistics about their water supply and sanitation situation, for WHO, they put it on papers, very quickly and roughly. They seldom indicate for how long the scheme has been working properly. With traditional technology there is the problem of quality.

INSTITUTIONAL TRENDS OF WATER SUPPLY IN FINLAND

by Dr. H. Kiuru and Mr. M. Korhonen
The Association of Water Supply and Sewage Works in Finland
(summary presented by Mr. T. Katko, TUT)

1. Present situation

A little over 60% of public Finnish waterworks are owned by municipalities. The less than 40% of privately owned public waterworks consist mainly of small waterworks in the population centers of rural communities and sparsely-populated areas, particularly in Ostrobothnia and northern Finland.

The most significant principal difference between municipal and private waterworks, from the viewpoint of administration and operation, is that municipal works fall under the general technical administration of municipalities which again is a part of municipal administration. On the other hand private works are fully autonomous and accountable administrative and economic units.

Presently over 80% of the country's population lives in dwellings connected to public waterworks. Practically everyone living in a population center is supplied water by a waterworks. Even in sparsely-populated areas nearly the entire population whose connection to public waterworks is economically and technically sensible is covered by them.

2. Operational development goals

On the basis of the above we can state that the operational areas of public waterworks are not going to expand significantly nor will their number of connections increase. Every consumer supplied by public waterworks has at his disposal ample domestic water meeting, at least, reasonable quality standards.

The water supply and sewerage industry in Finland is a so-called "mature industry" where development is primarily aimed at the following goals:

1. Improving the quality standard or supplying consumers with the highest quality domestic water possible and the effective treatment of the wastewater resulting from water use
2. Maintaining a reliable service
3. Economy of operation

3. Development trends of water supply and sewerage organizations

3.1 General

As is the case in the rest of the developed world, also Finnish public waterworks have for long been business

enterprises: privately owned ones completely and municipal ones at least in principle.

As late as the early 1970's municipal waterworks were operated as regular businesses which were able to finance their operations fully with income from water charges while often also contributing their surplus to the municipal treasury.

The major goal of the introduction of municipal sewage fees in the mid 1970's and the merging of municipal waterworks and sewerage systems was to change the previous public service character of sewerage services into business activity. The goal has not, in general, been realized. The result has been that sewerage systems are continually financed partly by tax money.

Also the business character of providing water supply services in municipalities has become obscured, so that even waterworks are partly financed with tax revenues.

For the development of water supply and sewerage services to succeed in the 1990's and after, the municipal water supply and sewerage systems must be transformed as soon as possible into true business enterprises that finance their operation exclusively with charges collected from consumers and in return provide consumers with service that is of high quality, reliable and moderately priced.

To restore the true business character of municipal waterworks and to create it to their sewerage systems requires that these services, provided by a joint organization, are made as functionally and economically independent units as possible.

3.12 Making waterworks and sewerage systems independent

The minimum goal should be that municipal waterworks and sewerage systems are removed from under the general technical administration and made independent operational and economic units with their own full-time, fully accountable managers and with own administrative boards or common boards with other municipal enterprises.

When one thinks of the operational and economic volume represented by municipal water supply and sewerage systems, it is almost unbelievable that presently most water supply and sewerage systems, even in cities, are managed on a part-time basis by a chief engineer or construction manager. In rural municipalities the situation is, naturally, even worse.

The evident curtailment of municipalities' economic freedom that has taken place and is still continuing increases the pressure for giving water supply and sewerage systems autonomy. The first major municipal water supply and sewerage system became independent at the beginning of this year in Lahti, where the water supply and sewerage

system was removed from under the technical department and came under the business enterprise board as an independent business. The city of Pori is presently considering doing the same.

The same development is expected to start in rural municipalities' water supply and sewerage now that the report on the development of municipal business enterprises by the Finnish Municipal Association is completed. Even the National Government has appointed a commission to find practical ways for organizing municipal business activity that is not corporate in form.

3.13 Detaching water supply and sewerage systems from the municipal organization

If it is wished to carry the development as far as treating water supply and sewerage in a totally business-like fashion, the water supply and sewerage systems must be completely detached from municipal administration.

Such a development has already began in, e.g., England and Sweden. In these countries municipal water supply and sewerage systems are actually being privatized, i.e., their functions are being transferred to fully or mostly privately owned stock or other companies.

In Finland any immediate development in that direction is not likely or even desirable. Where good grounds and the political will for removing municipal water supply and sewerage systems from under municipal administration exist, the most probable solution is that water supply and sewerage systems will become the responsibility of stock companies controlled fully by a municipality or a group of municipalities.

Such an arrangement is presently being worked out for the area surrounding the Finnish Capital, where a stock company owned by the cities of Helsinki, Espoo and Vantaa is being established to take control of the water supply and sewerage system for the region that has already earlier been provided through agreements between the various municipalities.

If this arrangement is realized in the near future in the Helsinki region, it can be expected that the responsibility for municipal water supply and sewerage systems will be transferred to stock companies controlled by municipalities also in other parts of Finland.

In his summary of the paper Mr. Katko showed a table of the ownership of water supply schemes in Finland and in the USA (Appendix 1). In both of them the private ownership is important particularly in small size water supply systems.

APPENDIX 1

- a) Ownership of water supply schemes in Finland in 1985
(≥ 200 people)

Ownership	number	share
Water cooperatives Stock companies Partnerships etc.	236	<u>30</u>
Municipal waterworks	477	<u>60</u>
Industries	28	4
Government, hospitals etc	48	6
	780	100

- b) WS Systems in USA in 1987

System size (persons)	Share of total systems %	Publicly owned %	Privately owned %
25 - 10 000	70	38	<u>32</u>
> 10 000	30	25	<u>5</u>
Total	100	63	37

DISCUSSION

Mr. Pietilä:

Privatization: Is it sensible in the water sector where the water company always has a monopoly? What are the experiences? Is it not true that after privatization the same persons will run the same scheme in the same area? Where is the change? What are the benefits?

Mr. Vikman:

The ownership is not important. Flexibility increases if the water company is freed from under the municipal decision-making and made an autonomous body. Many decisions are easier on the professional level. For instance, the manpower in Finland will decrease so that soon the water sector will have a shortage of qualified and motivated personnel. Savings could be reached in operation and maintenance costs with more efficient use of manpower. It will be much easier if the water supply system is independent of the municipal decisions.

Mr. P. Rantala:

Finland is proud of its numerous free associations. In sports where people are keen on associations, private companies are starting to operate in the field of ice-hockey, finding investors and obtaining good results.

Mr. Makongwa:

A private enterprise makes a profit, and at the same time this enterprise is to be self-supported and has to plan investments for the future.

Mr. P. Rantala:

Yes, this is why in Finland all big cities have a municipal system, because for a private company or cooperative it is a heavy burden to take a loan with a 20 year repayment period, so that investments are rather difficult for them. The municipalities can manage it.

Mr. Vikman:

For example the telecommunication services in Helsinki are run by a cooperative.

The Reporter:

In smaller water supply systems particularly in the western part of Finland - cooperatives and small stock companies - people in many cases claim that they are very proud of the fact that they have never used any money from the government or the municipality! Neither grants nor loans. They consider that they have saved the money that is needed to apply for and manage the grants. It seems to be a question of attitude.

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TAMPERE UNIVERSITY OF TECHNOLOGY
Tieteenkatu 21, Hervanta

POSTAL ADDRESS: P.O. BOX 527
SF-33101 Tampere
FINLAND

TEL: + 358 (9)31 162 111
TELEX: 22313 ttktr sf
TELEFAX: + 358 31 162 907

TAMPEREEN TEKNILLINEN KORKEAKOULU
VESI- JA YMPÄRISTÖTEKNIIKAN LAITOS
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TAMPERE UNIVERSITY OF TECHNOLOGY
Tieteenkatu 21, Hervanta

POSTAL ADDRESS: P.O.BOX 527
SF-33101 Tampere
FINLAND

TEL: +358 (9)31 162 111
TELEX: 22313 ttctr sf
TELEFAX: + 358 31 162 907
