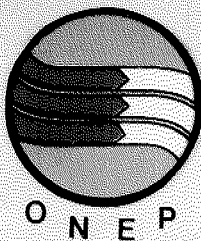


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MA 89

KINGDOM OF MOROCCO  
NATIONAL OFFICE OF POTABLE WATER



المملكة المغربية  
المكتب الوطني للماء الصالح للشرب

# THE DRINKING WATER SUPPLY AND SANITATION DECADE IN MOROCCO 1981 - 1990

## ACTIONS BY ONEP

PROVISIONAL ASSESSMENT - December 1989

824-MA89-8099

## Foreword

The present brochure comprises two parts. First, a short overview is given on the sector organization, access to drinking water, water quality monitoring, sanitation and an evaluation and future prospects of the Drinking Water Supply and Sanitation Decade in Morocco. Details on some particular aspects are presented using sheet forms, in a second part.

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December 1989

## SECTOR ORGANIZATION

At the Independence dawn , Morocco has endowed itself with an organization of the water supply sector which has allowed to face successfully the social, economical and demographic development problems of the country.

The system is based on the local communities autonomy, ratified in 1976 by the Council Charter, which gives full latitude and responsibility to the communities for the management of their public services. For the drinking water and sanitation services, the communities themselves may manage them, or create an autonomous municipal utility, or leg the management to the National Office of Potable Water (ONEP). So in 1989, 16 municipal utilities exist and ONEP intervenes in 104 centres. In 1988, the municipal utilities and ONEP cover around 10.5 Millions people in a population of 24 Millions.

Besides, the planning of the drinking water supply of the country, the engineering and management of the transmission mains, and the pollution monitoring of those waters meant to be used for drinking purposes are among the ONEP duties, since it was established in 1972. This is especially due to the water resources scarcity and their spacial and temporal distribution irregularity, which generate heavy investments for any regional or inter-regional transfer.

This global system has proved itself to be adequate and reliable over the last 20 years and has demonstrated the ability of facing crisis situations. The severe drought of the 1980's has been efficiently faced by Morocco

as compared to other countries with similar structure and climate. The system is in fact a result of the impulse that His Majesty the King Hassan II gave, at the 1960 decade dawn, to the very large field of water through the Dam Policy, which has mobilized public authorities actions in order to rationally manage water resources, find the required investments and construct the necessary facilities.

Due to this sector organization, at the beginning of the decade in 1981, Morocco was in a privileged position to fully benefit from the international cooperation, the availability of funds and the technology transfer. Moreover, this advantageous predisposition has permitted the country to assume a not negligible role in South-to-South cooperation within the region.

During the decade, the situation has been unfortunately characterized not only by the long drought but also by a drastic reduction of public financial means caused by the internal will of reorganization on one hand, and by the declining availability, after the first years, of the international financial environment.

Despite these internal and external negative constraints, the country has been able to achieve the performances of which the aspects presented hereafter can provide an overall idea.

## DRINKING WATER ACCESS

The financial resources required to accomplish the equipment and operation tasks are provided by the national tariffing system established by the public authorities since 1977. The system is featured by two consumption limits, the first one of which is known as the "social category" whose consumption should not exceed 30 cubic meters per trimester.

To face the increasing investments due to the resources scarcity and negative drought effects, the system has been revised in 1982. Firstly, the second category has been limited to 60 cubic meters per trimester, secondly a third category has been created for the excessive consumptions, whereas the social category of 30 cubic meters still continues with the least cost allowing access to satisfaction of the elementary needs in drinking water and hygiene.

From 1983 until 1988, the public authorities have proceeded to annual increase to adapt unit prices to sector constraints without varying the system structure.

Besides, it is to be noted that the adopted approach of the economical cost of development, applied to production and distribution facilities, has allowed to save the local natural specificities. This is in order to maintain production and distribution costs at an appropriate level related to water resources and projects nature throughout the different cities of the country.

In concert with these efforts, some social actions have been undertaken such as the social connections ("branchements sociaux") programme launched in 1982 which facilitates

the payment of the houses water supply connecting costs. This has allowed ONEP to realize 37.000 new connections from 1982 to 1989, and has improved the connection rate of the urban population as well as the service structure. The public standposts have disappeared in equipped town zones and have been transferred to the peripheral regions. In this way, the improvement of the connection rate led to an increase of the financial resources and permitted the expansion of the distribution network towards the semi-rural peripheral areas and to communities bordering the regional water supply schemes.

This programme has been carefully prepared by use of a large information campaign of the authorities and public sensitization including stickers, posters and television announcements.

A special attention has been given to public standposts management which were previously one of the causes of water waste and urban pollution. An elaborated pilot study resulted in a management system which consists of an attendant-seller supervised by the users, the local collectivity and ONEP. This system has allowed multiplying public standposts in the semi-rural areas, especially along the regional water supply schemes.

Within the framework of the communities autonomy, and considering the specificity of drinking water problems and the importance water takes in national economy, the water management has been more and more entrusted to the care of specialized organisms : such is the case of the municipal utilities and ONEP intervention in a large number of small towns. To resorb

## DRINKING WATER ACCESS

( continued )

management deficits in these centres where the production and distribution costs are higher than in large cities, and in order not to affect directly the local consumers, leading thus to rural depopulation, a national solidarity surtax has been applied in 1985 to water production, allowing thus to prepare a take-over programme by ONEP of the management of about a hundred new centres during the 1989-1991 period. Besides, the planning studies of around 500 chief towns of rural communities have been undertaken.

In 1989, a rural water supply master plan has been launched in order to provide public authorities with choice bases for general criteria, and with institutional solutions and technical guidelines proper to permit a quick and coherent completion of the drinking water supply to populations. In this manner, the communities themselves will receive the appropriate tools to rationally use the important financial resources constituted by the 30 % of the receipts of the value added tax (VAT) income. These resources are set aside especially for community development since 1987.

## CONTROL OF WATER QUALITY

The increasing demographic growth, the rural depopulation, the high input agriculture modernization, the development of the national industry aiming mainly to reach quickly the commercial balance of the country, and finally the growth of the touristic reception capacity are all risk factors which influence drastically the ecological equilibrium.

The growth in water pollution combined to the increasing need of using surface water for drinking water production, have led Morocco during the decade to endow itself with the

structures and necessary methods for a strict control of water quality and the protection of water resources, to increase the water treatment plants and to broach the preparation and ratification of national water quality standards.

By the end of 1989, the country has 32 laboratories for monitoring water quality and more than 30 water treatment stations, and 39 water quality national standards officially confirmed or under ratification.

## PLANNING AND INTERNATIONAL COOPERATION

Water supply planning has been released since the sixties through the establishment of the National Master Plan with the collaboration of United Nations Development Programme (U.N.D.P.) and World Health Organization (W.H.O.).

This master plan constitutes a tool for dynamic management which is continuously updated. It permits to control water demand evolution, to set apart appropriate water resources, and to predict necessary investments and elaborate a priorities schedule.

The planning for the coastal zone from Kenitra to Jorf El Asfar Phosphate Industrial complex has been undertaken withing this framework.

This zone (see attached figure) in which the water supply has been insured throughout master plans, is of paramount importance since it presents a very high industrial and human concentration. Its water supply involves three hydrographic basins : Bou Regreg, Oum Er Rbia, Sebou. Hence the U.N.D.P. and the W.H.O. collaboration has generated the adequate institutional response to the need of planning and management organization. On the other hand, this collaboration has been a preferential cooperation which was pursued along years. The O.N.E.P., U.N.D.P. and W.H.O., have also set up eight projects dealing with pre-investments studies, protection and improvement of water quality, water supply and hydraulic networks, human resources developments, maintenance and rehabilitation of water works, water economy and education. Moreover, the international

cooperation brouth a financial and technical support for the realization of the studies and investment programme.

The O.N.E.P. has therefore benefited within this framework from contributions of international institutions as :

- The African Development Bank,
- The International Bank for Reconstruction and Development / World Bank,
- The European Economical Communities,
- The Kowetian Development Funds,
- The Saudi Arabian Development Funds,
- etc...








And also from some friend countries as :

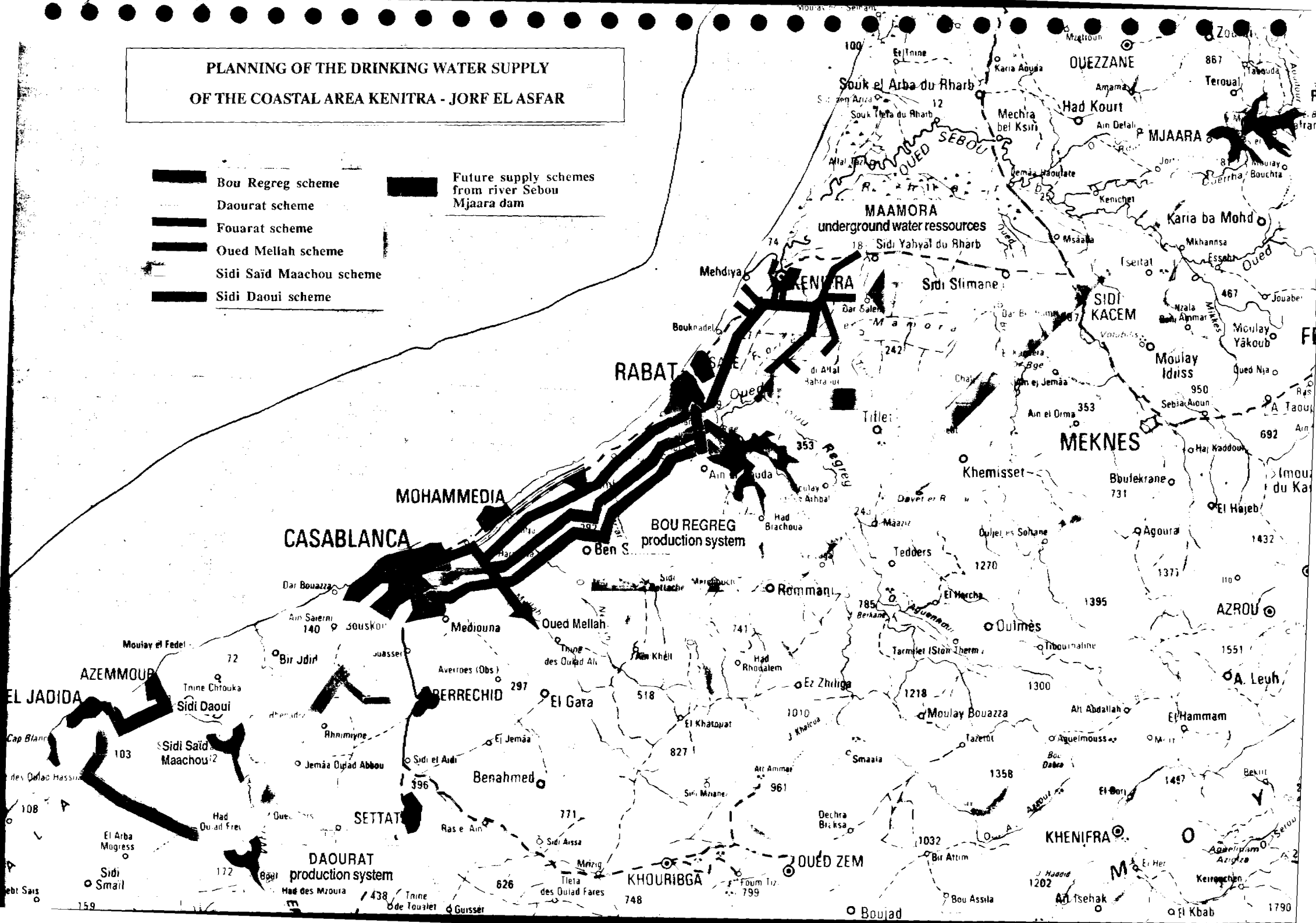
- Belgium,
- France,
- Italy,
- Netherlands,
- Saudi Arabia,
- West Germany,
- etc...

Beside, some projects are initiated with Japan.

The bilateral cooperation if often managed by specialized organisms (such as the K.F.W., the G.T.Z., the J.I.C.A., the C.C.C.E., I.D.R.C., etc...)

**PLANNING OF THE DRINKING WATER SUPPLY  
OF THE COASTAL AREA KENITRA - JORF EL ASFAR**

-  Bou Regreg scheme
  -  Daourat scheme
  -  Fouarat scheme
  -  Oued Mellah scheme
  -  Sidi Saïd Maachou scheme
  -  Sidi Daoui scheme
-  Future supply schemes from river Sebou  
Mjaara dam



## SANITATION

The urban sanitation and the environmental respect were always belonging to the Moroccan culture, based on islamic precepts and tradition. As far back as the Xth century, the public hydraulic network of Fes city had been conceived not only for water supply but also for waste disposal.

Once more, the exponential demographic growth, the rural depopulation and the industrial development have generated new problems which were assessed during the decade using a global approach promoted by the public authorities.

The primary aspect of large cities waste water, which is not only a main pollution source but also an element to be exploited in a country with scarce resource, has been addressed in different pragmatic manners. As an example, waste water re-use (Marrakech, Temara, Ouarzazate), soil purifying capacity (Agadir, Meknès), and first of all, the sewerage institutional management problems through the master plan of the Greater Casablanca, where sanitation has been entrusted to the care of the Municipal Utility for Drinking Water and Electricity Distribution.

The costs recovery has to be done through a tariff related to the quantity of water consumption and also to the qualitative characteristics of waste water.

Owing to the country's Higher Water Council guidelines, a principle has been adopted in 1988 which consists of managing both drinking water and waste water by the same utility. Accordingly, Casablanca experience is being extended to 12 other large cities where sanitation master plans have been launched by the respective autonomous utility. On the other hand, ONEP has started the sanitation studies in villages where it is in charge of drinking water management.

In addition to the above, the public authorities are launching a national sewerage master plan, which is intended to provide the theoretical bases, and the technical and operational guidelines for approaching the problem at the national level.

The adopted policy has resulted, during the decade, in a system which, although under continuing improvement and consolidation, shall end up rapidly with a global solution to the sanitation problem.



## EVALUATION AND PROSPECTS

The adhesion of Morocco to the International Drinking Water and Sanitation Decade (IDWSSD) has permitted to reinforce the guidelines adopted by the public authorities concerning the drinking water and was an impulse to the sanitation new dynamics.

The wide and complex water problem is a country primary concern . It is within this policy that must be considered the by far most important action taken during the decade : the creation of the country's Higher Water Council under the High Authority of His Majesty The King Hassan II, and aimed to :

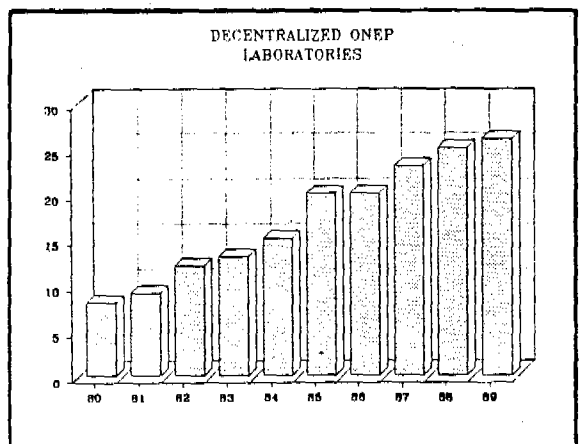
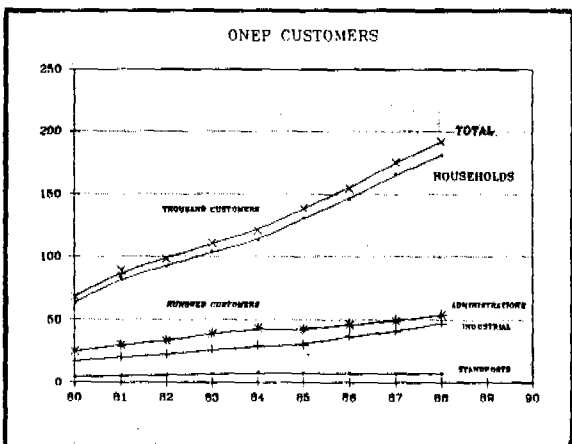
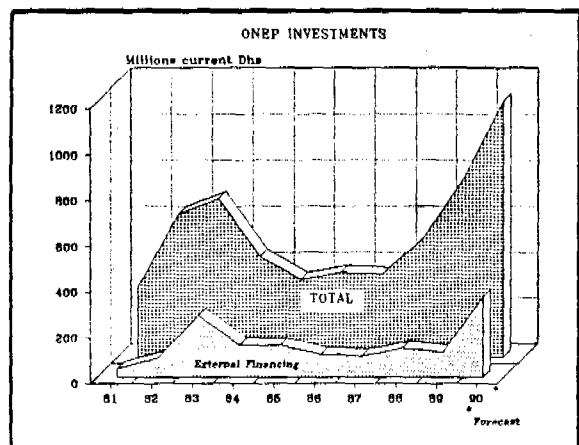
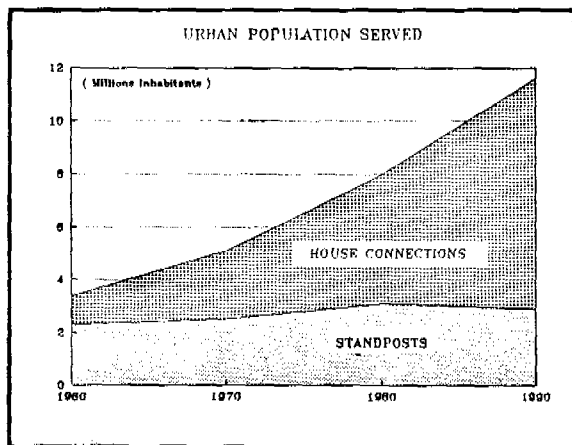
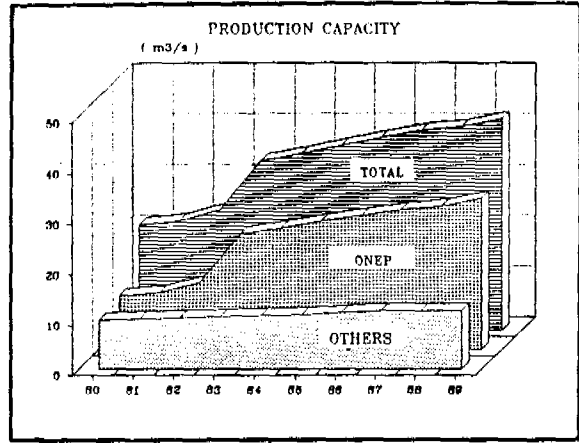
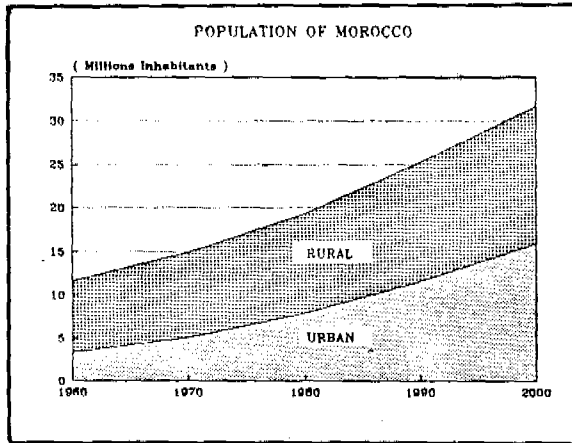
- provide general guidelines,
- adopt master plans for water resources utilization programmes,
- advise on proposed legislative texts including water acts and bylaws,
- arbitrate litigation cases concerning resources allocation.

Convened several times to exert its advisory capacity, the Council issued master guidelines concerning priority themes of drinking water and sanitation, the water act, large dams and small dams, water pollution and inter-regional water resources transfers.

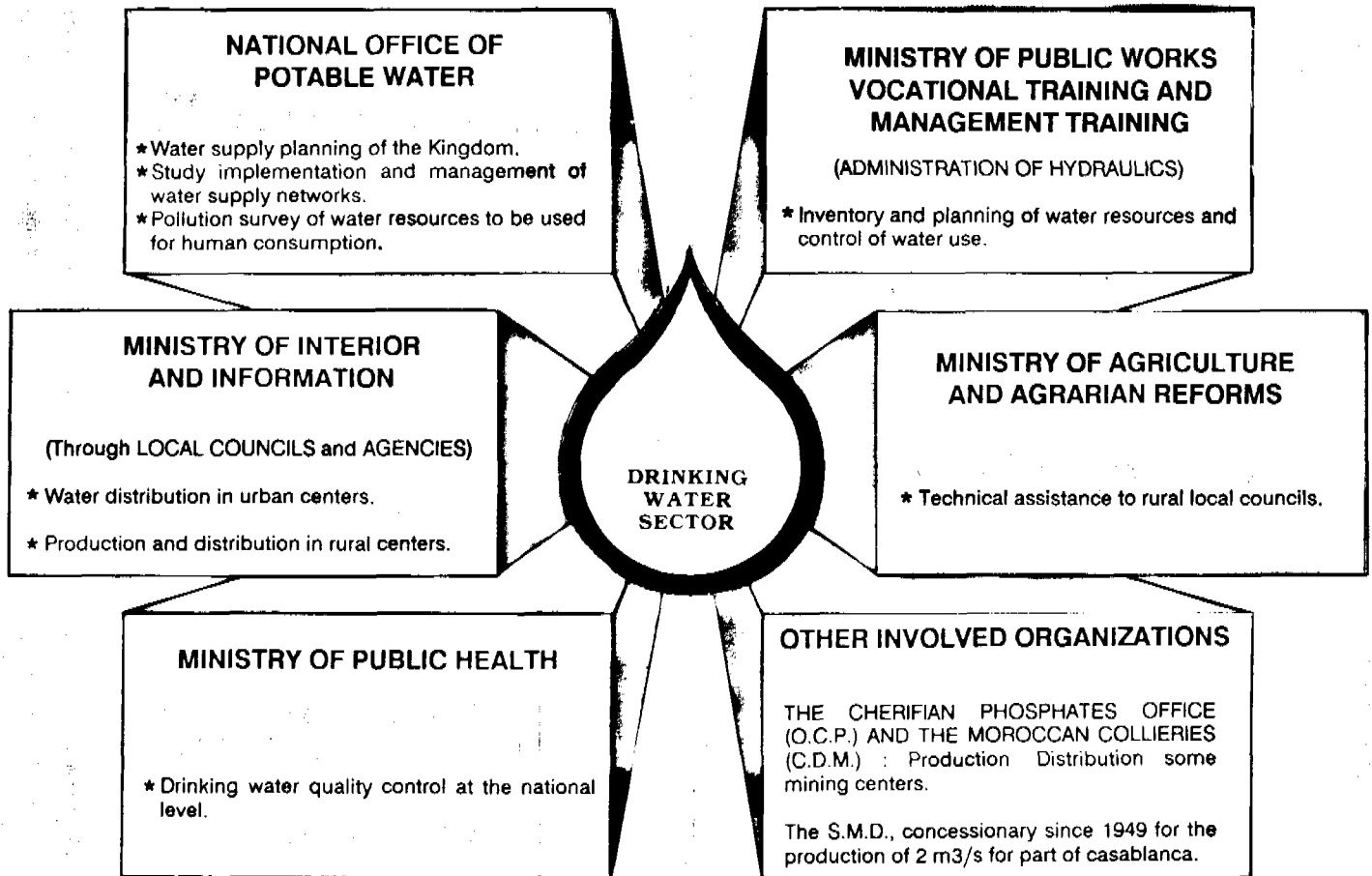
For the forthcoming decade, the goals to be achieved concern the conservation of the obtained outcomes by rationalizing and improving the management, the reinforcement of the sanitation approach and policy, and the extension of all the above to the rural communities by appropriate means. The mastership of advanced technologies of waste water re-use, demineralization, desalination and water protection against pollution, has to be developed to pursue the undertaken efforts.

Thus, Morocco will be in a position to reach the water management and economy capacity leading to an efficient participation in the general environment protection and to achieve the goal of drinking water for all by the year 2000.

## TRENDS OF SOME INDICATORS 1980 - 1990



# POTABLE WATER SECTOR ORGANIZATION



## HIGHER WATER COUNCIL

Advisory body under the High Authority of H.M. the King

- \* General guide lines for the sector
- \* Approval of masters plans
- \* Examination of draft legislative texts
- \* Arbitration of issues related to resources allotment

## TARIFFING SYSTEM

The implemented tariffing system is aimed to :

- deliver services at a price as close as possible to the real cost,
- insure vital water needs at a minimum price, and limit strong disparities which could penalize remote scattered users, i.e. villages and rural communities.

The structure relating to tariffs is hence gradual and based on three consumption category types: the social category whose price is less than the delivering cost, the intermediate category whose price is close to the latter, and a third category with higher price aimed to avoid excessive consumption and wastes.

Moreover, a preferential tariff is applied to public standposts and public baths (Hammams) in order to benefit to the poorly developed zones, and to maintain at low cost the traditional personal hygiene methods.

The above structure allows therefore the protection of the interests of the low income population.

During the decade, the ever growing number of centres managed by specialized agencies at very high service cost owed to remoteness of resources and small size of the centres, has brought the introduction of a national solidarity surtax levied on water production. This tax helps in levelling the unacceptable tariff disparities between villages and cities and plays also a psychological role among the rural population, which feels "dispossessed" of its water in favor of the urban sub-sector.

On the other hand, the calculation method of the distribution tariff takes into account a technical efficiency level set fore as a goal to the distribution utility and constitutes an important tool in encouraging the improvement of installations.

## STAFF TRAINING

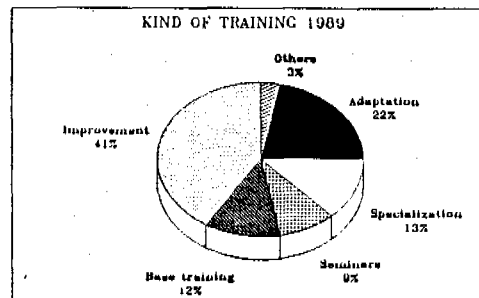
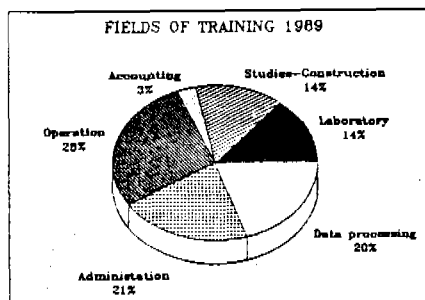
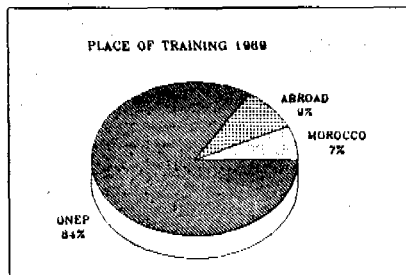
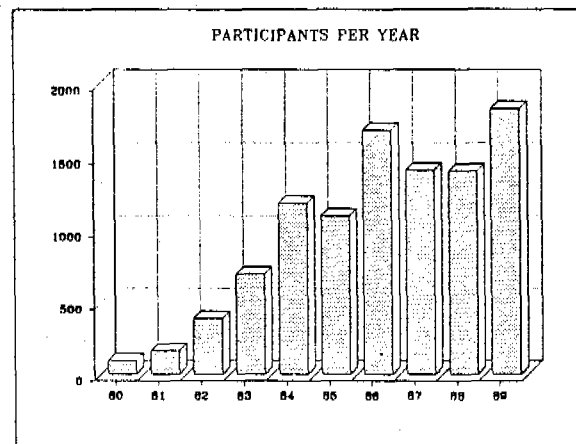
During this decade, ONEP has multiplied its efforts in the field of training in order to increase its management efficiency and service quality.

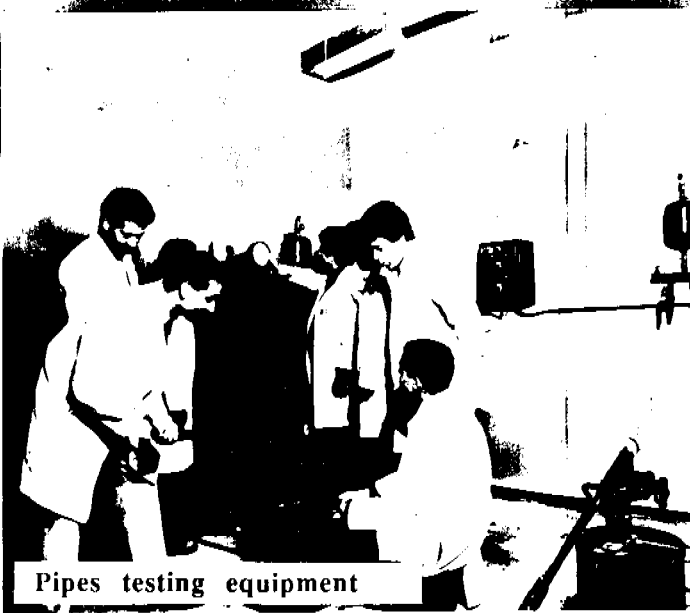
At the beginning, as with the past decade, the Water Technician Training Centre (CFTE) has aimed at the basic education of the quantity of new technicians needed for ONEP development, and at the recycling of senior technicians.

In the last years, high quality continued education has prevailed in order to :

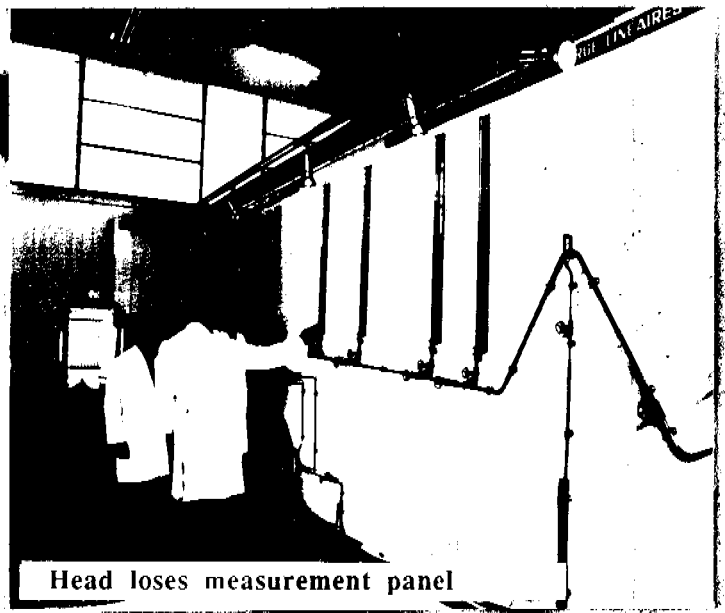
- systematically adapt staff to their functions via short term training stages,
- improve the technicians knowledge using trainings leading to promotion,
- inform and sensitize managers and technicians to update their knowledge and to learn about new processes.

This programme has allowed education of 1832 persons in 1989 as compared to 100 per year at the beginning of the decade.



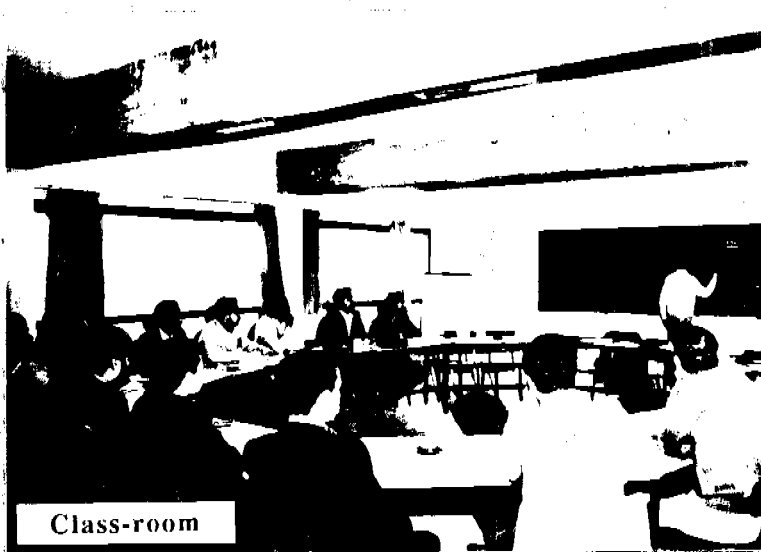


Pipes testing equipment

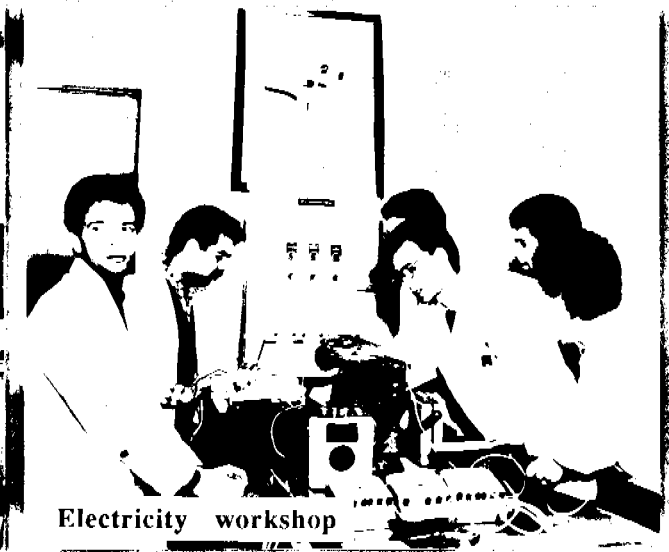


Head loses measurement panel

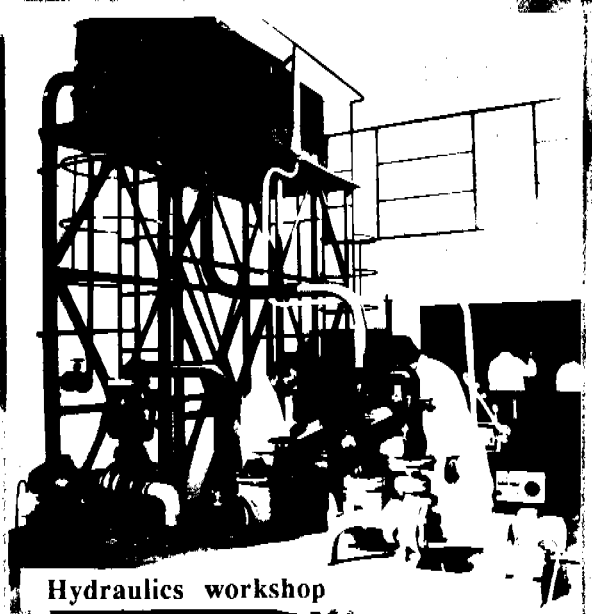
## STAFF TRAINING



Class-room



Electricity workshop



Hydraulics workshop



Leaks detection on buried pipes network

## ONEP LABORATORY

The Central Laboratory of ONEP and the network of its 26 agencies spread throughout the country are continuously insuring the quality control of the produced and distributed water.

These controls are made during all the water handling stages, i.e. production, transmission, treatment and distribution, and consist of physical, chemical, bacteriological and biological tests. The monitoring is regularly and continuously insured by ONEP central and decentralized laboratories, according to the Moroccan drinking water quality standards. The decentralized laboratories test results are transmitted to the laboratory headquarter in Rabat for analysis, interpretation and long term monitoring of the quality of the exploited water.

Thus, in 1989 about 1600 sampling points were inspected using 250.000 results grouped in 10 different types analysis forms.

The central laboratory activities are not restricted only to inspection and monitoring of water quality, but cover also other necessary and important themes, as :

- tests and analysis during projects elaboration to insure that the best water collecting system is used and protected against pollution, and to define the suitable treatment process,
- technical assistance to the operator in improving the applied treatment process,
- pollution control of waters likely to be collected for human supply, including the studies of waste water quality, disposal and re-use,
- participation to the legislative and bylaws efforts,
- technical assistance to organisms which are in need of monitoring waste water quality,
- applied research in all fields of activity of the laboratory.

Besides, owing to its mandate, the headquarter laboratory is in permanent contact with health authorities, research centres, national and international institutions dealing with water problems, and participates in national and international scientific meetings and congresses. These relations have permitted the promotion of cooperation programmes, especially in the field of the research activities concerning high technology topics as well as appropriate rural technologies.

The cases studied or under study mainly deal with:

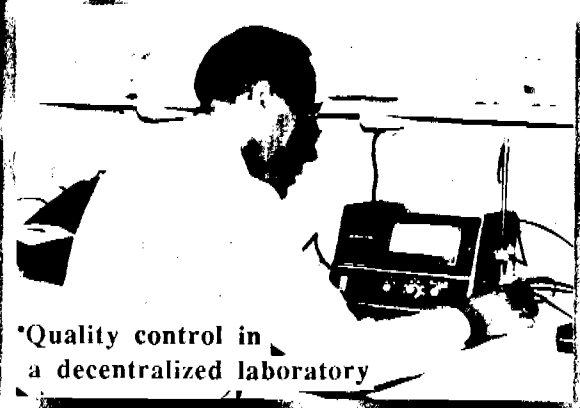
- water pollution: groundwater contamination by nitrates, reservoir eutrophication,
- biological toxicity tests,
- water demineralization,
- protection of drinking water production systems,
- simple sanitary classification tests as well as bacteriological determination tests,
- definition and diffusion of simple technologies for water disinfection using solar radiation.



Water sampling for analysis

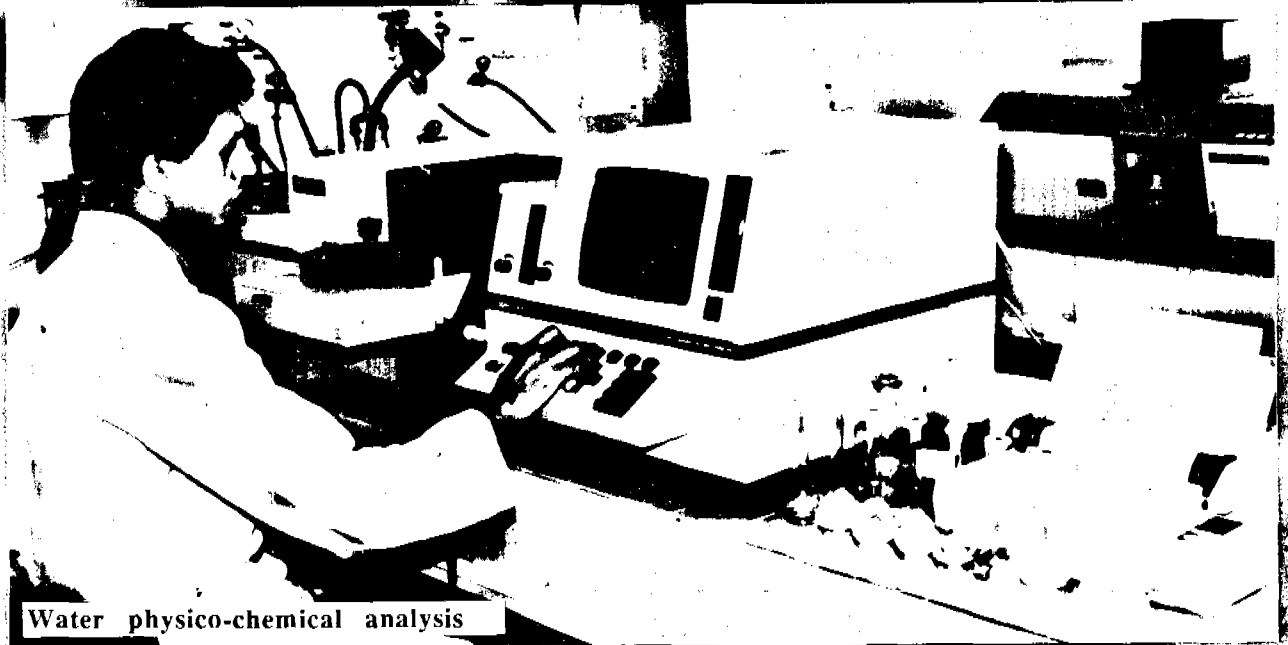


Treatment test



Quality control in a decentralized laboratory

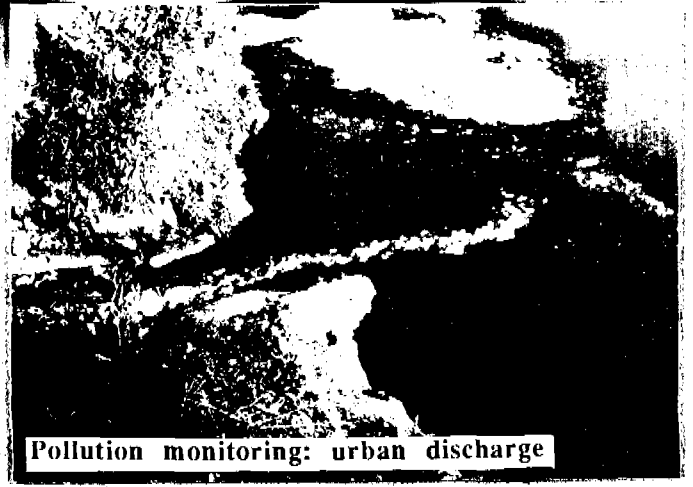
# WATER QUALITY CONTROL



Water physico-chemical analysis



Toxicity test on striped fishes



Pollution monitoring: urban discharge



## SOCIAL HOUSE - CONNECTIONS

In order to extend the water supply policy within the low income population, the public authorities have launched early in the eighties a national programme for social connections based on loans concession to the new customers for financing the costs of the house-connection.

This programme constituted the main component of the third drinking water project jointly financed by the Kingdom of Morocco and the World Bank. The latter has provided the country with an 87 Millions dollars loan, of which 52 Millions devoted to social connections.

The overall objective of the programme was to promote households service by providing 150.000 connections at the nation level, 32.000 of which in the centres managed by ONEP.

The implementation of this voluntary policy based on easy terms offered for the initial dues (connection and network extension costs) has been started in 1982 by ONEP following a socio-economical study, carried out in some centres during 1980, the results of which have shown that the main limitation to the increase of connections number were:

- the high level of the initial due,
- the lack of pipelines in some streets.

To promote the operation's implementation ONEP has undertaken a series of actions:

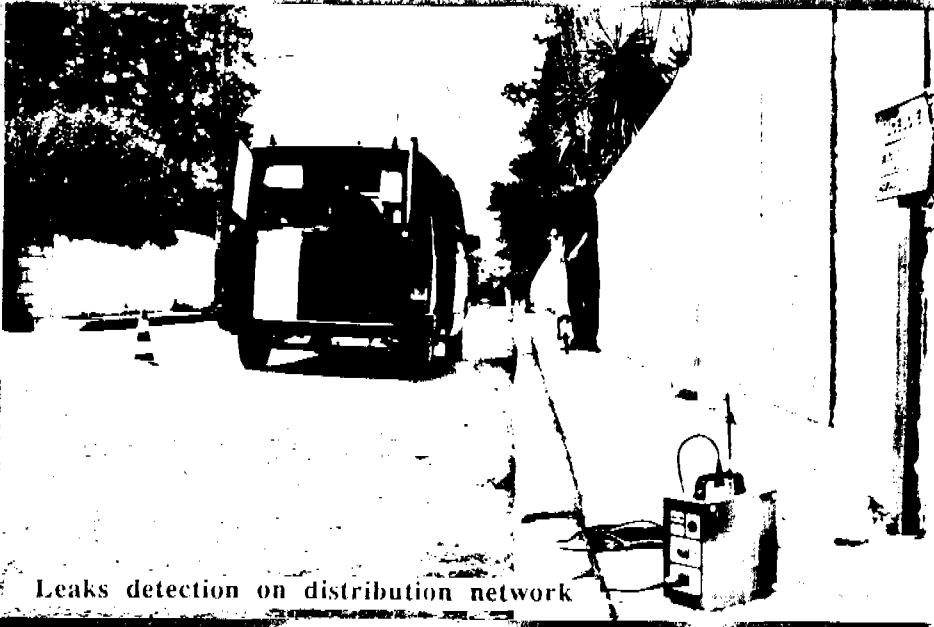
- training of the personnel to the new tasks concerning the social connections,
- information of the authorities, the local representatives and the public about the operation advantages by the mean of mailing, meetings, and the launching of a campaign using stickers, posters and television announcements.

By the end of 1989, the social connections number installed by ONEP was around 37.000, i.e. 115% compared to the initially assigned objective.

These social connections have been achieved by conceding loans to the customers in a amount of 89 Millions Dirhams which averages 2400 DH per household.

The operation has substantially improved the connection rate of the population (ONEP consumers' number has shifted from 69.000 in 1980 to 192.000 in 1988 ) and has among other produced a positive effect in permitting the transfer of public standposts to semi-rural and peripheral areas.

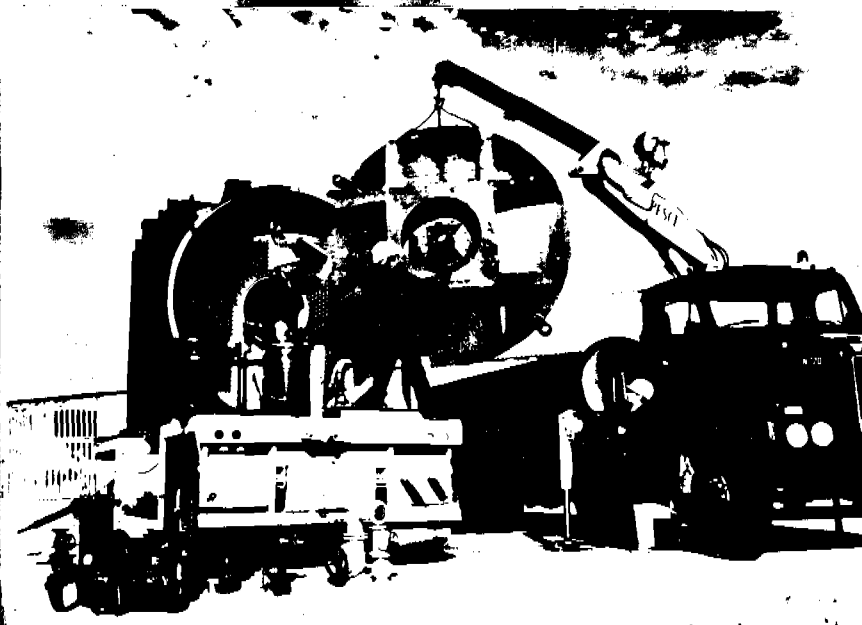
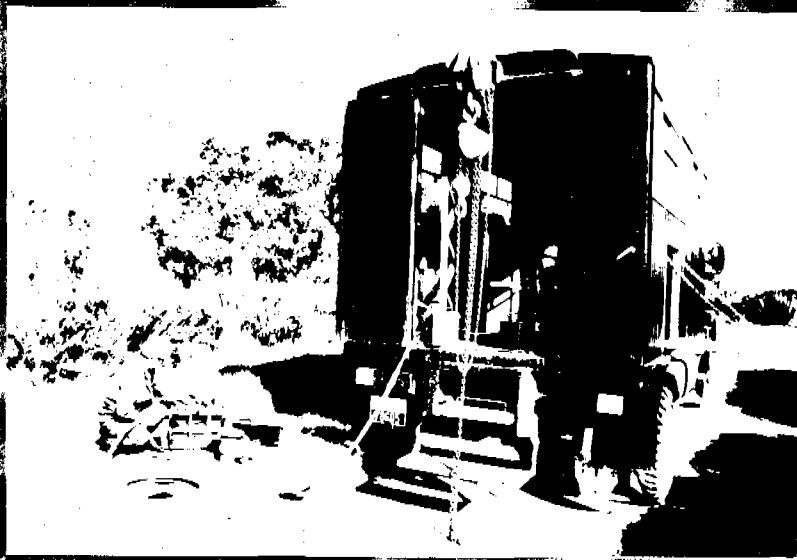
# MAINTENANCE



Leaks detection on distribution network



REPAIRING INTERVENTIONS



Maintenance of a mobile desalination unit



Distribution meters gauging

## PUBLIC STANDPOSTS MANAGEMENT

The public standposts, as the fountain broadly speaking, has been always a fundamental element in urban as well as rural population water supply. Its functional importance and frequent use have rendered it a social attraction pole, and a place for daily human interactions.

Nowadays, the public standposts remain the appropriate technical mean of drinking water supply of non-equipped zones and semi-rural villages under infrastructure consolidation.

However, within the increasing constraints framework of the fight against the waste of the scarce and onerous water resource, the fight against the environmental pollution, and the need of costs recovery, a rational management system of the public standposts is more and more required. The traditional management system under the local Community Council responsibility charging the water bills to the community budget, presents high difficulties in respect of technical control of the facilities and adequate financial resources mobilization, taking in due consideration the quantity of other important social issues communities have to take care of.

Fully aware of these problems and of the important role of the public standpost, ONEP has designed a four axes based strategy during the decade :

- gradual reduction of the public standposts number in zones equipped with hydraulic networks, along with the implementation of a policy able to encourage the connection of low income families (social connections),
- installation of new public standposts in centres and urban areas where service by household connections would not be technically feasible,
- consumer financial participation to the water bill payment, allowing ONEP to recover its claims while relieving the communities budget charges,
- implementation of the attendant system, insuring proper control and cleanliness of the public standposts.

Concerning the consumers participation, depending on the communities and users choice, three systems have been developed from pilot experience and are set up according to the socio-cultural characteristics of the different centres:

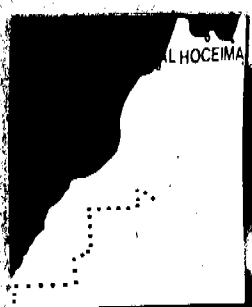
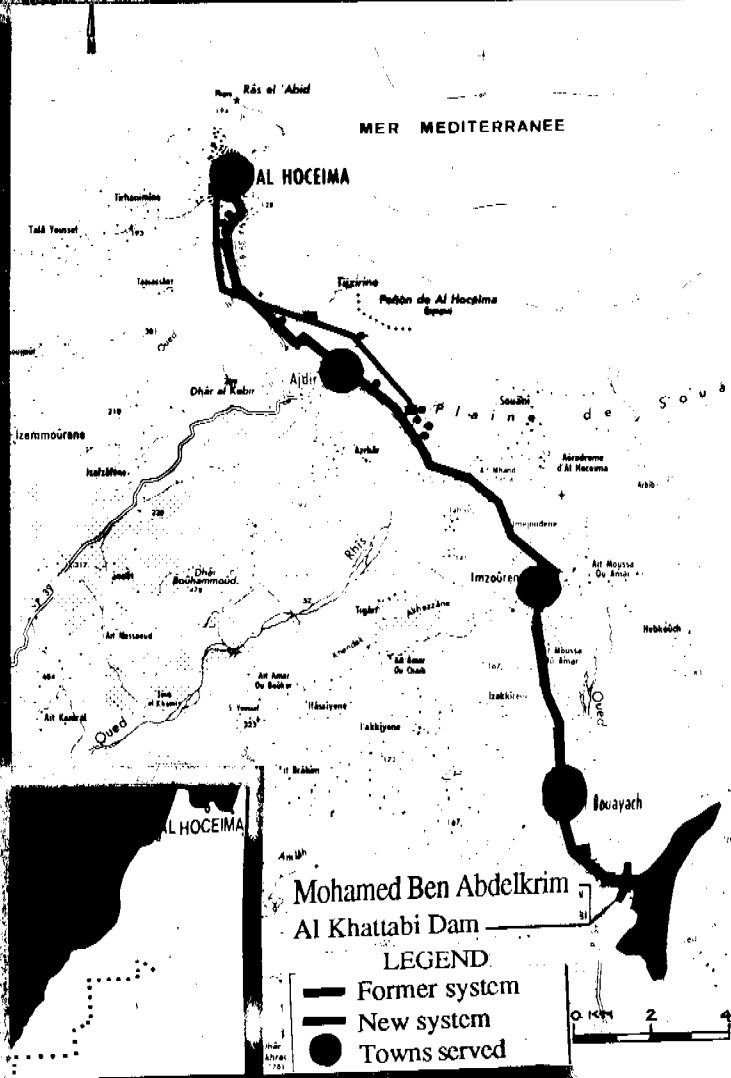
- the management by a consumers association who designates an attendant and takes care of bills recovery,
- the management by an attendant-seller designated by the Community Council, liable to ONEP for the water bill payment, collecting users's payment on water delivery at controlled tariff, and responsible for the standpost caretaking and small repairs,
- the management through a permanent committee constituted by local public authorities, municipal representatives, consumers representatives, attendant (salaried employee) and the ONEP representative. These committees are chaired by the municipal administration chief and distribute the water bill among households beneficiaries of the public standpost.

## REGIONAL WATER SUPPLY SCHEMES

Within the framework of its continuous efforts for improving the drinking water access, one innovative action deployed by ONEP concerns the regional water supply schemes. The concept fundamentals of the water supply system is to deliver services to as much consumers as possible bordering the main. The supply scheme is therefore not only a mean of water transfer from the catchment and production facilities to urban districts, but is rather a valuable public infrastructure with a paramount importance in land development, and hence in social and economical welfare of urban and rural populations.

Regional Schemes built by ONEP (outside the Atlantic Coast)						
Regional Scheme	Commission Year	Production capacity l/s	Length Km	Population served 1990	Number of Centres/ Villages Served	Number of Public Standposts
MY YACOUB	1980	34	33	9.500	20	19
SAIDIA-AHFIR	1983	145	24	29.300	6	2
NADOR	1984	462	52	120.000	4	-
AL HOCEIMA	1985	405	23	93.000	4	-
ERRACHIDIA	85-89	200	105	230.000	241	250
TIZNIT	85-90	140	112	70.500	15	39

# REGIONAL WATER SUPPLY SCHEMES SPREAD OUT THE DRINKING WATER SERVICE TOWARD THE RURAL POPULATION



Mohamed Ben Abdelkrim  
Al Khattabi Dam

- LEGEND
- Former system
  - New system
  - Towns served



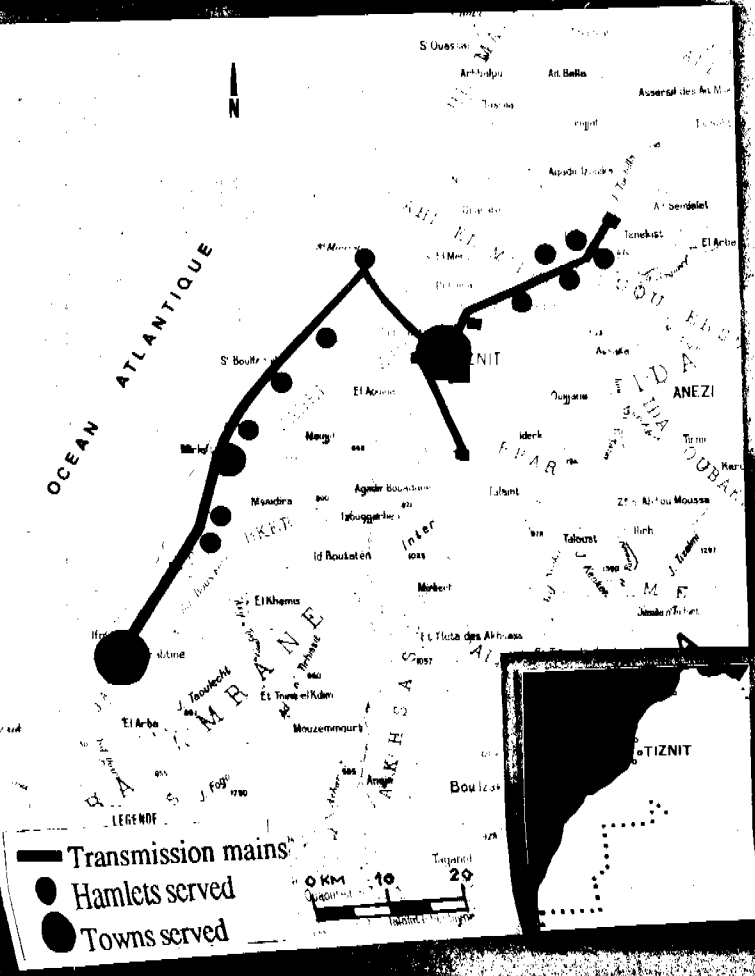
Public stand-post - Errachidia

AL HOCEIMA REGIONAL SCHEME

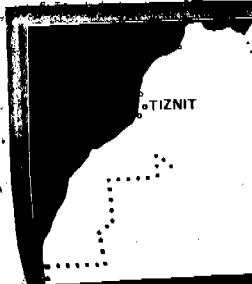
REGIONAL SUPPLY SYSTEM  
FOR TIZNIT AND SIDI IFNI AREA



Water reservoir



- LEGEND
- Transmission mains
  - Hamlets served
  - Towns served



## MAIN ONGOING SANITATION PROJECTS

### At the National Level :

- . Master Plan of the Greater Casablanca and construction of approved first phase works.
- . Master Plans of Rabat-Sale, Fes, Tangiers, Agadir, Marrakech, Settat, Nador, Meknes and Kenitra cities.
- . Master Plan of El Jadida and Safi cities.
- . Master Plan of Tetuan city.
- . Waste water re-use project at Agadir, Meknes, Marrakech, Fes, Temara.
- . Pilot study for waste water re-use for agricultural purposes at Ouarzazate.
- . National Sewerage Master Plan.

### At the ONEP Level :

- . General and feasibility studies of Khenifra and M'rirt cities. 1989-1992.
- . General and feasibility studies of water supply and sanitation of 26 small centres ( 1st phase over a total of 94 centres). 1989-1991.
- . General and feasibility studies of water supply and sanitation of El Gara, Ben Ahmed, Zaio, and Mont Aroui. 1989-1991.
- . Sanitation study of Ouarzazate city: master plan at the horizon 2010, preliminary and final design and tender documents of the first phase of the retained programme. 1990-1992.
- . General studies of water supply and sanitation of 16 centres where ONEP is in charge of water distribution. 1990-1992.
- . General and feasibility studies of water supply and sanitation of 68 centres ( 2nd and 3rd phases over a total of 94 centres). 1990-1994.

ONEP's policy is to establish jointly the water supply and the sanitation studies. The studies undertaken by ONEP are dealing with liquid and solid waste.