

**Water and Sanitation Program**

An international partnership to help the poor gain sustained access to improved water supply and sanitation services

# Independent Water and Sanitation Providers in Africa

## Nouakchott MAURITANIA

7

**West and Central Africa Region**

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Federal German Ministry  
for Economic Cooperation  
and Development



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# The importance of private operators in the potable water system<sup>1</sup>

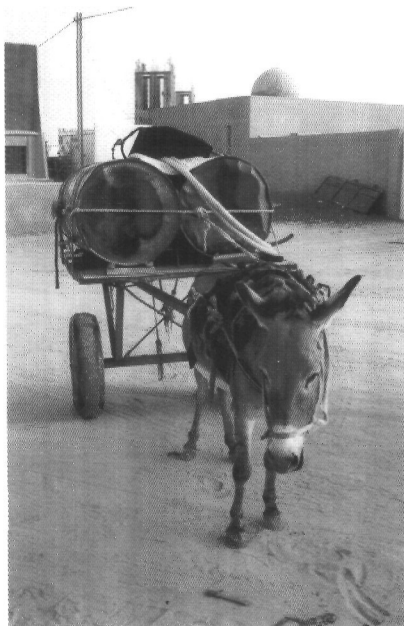
## Non-existent in water production in Nouakchott but essential in small centers...



The National Society of Water and Electricity (SONELEC) holds a monopoly in potable water production for Nouakchott and 9 other urban centers. Thirty or so boreholes situated 65 km from the capital supply 35,000 m<sup>3</sup>/day of water.

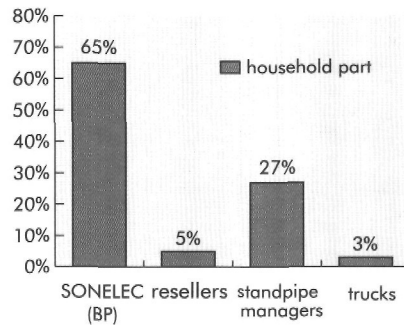
On the other hand, most secondary centers are supplied by the Department of Hydraulics' potable water system operated by private concessionaires.

Wells are non-existent in Nouakchott and are being progressively abandoned



<sup>1</sup> Exchange rate: 100 Ouguiya (UM) = 300 FCFA = 3 FF

Population serviced by type of distributor



in smaller centers, and do not offer an alternative to SONELEC's system of AEP concessionaires.

## ...and important in water distribution in peri-urban areas and small centers

SONELEC's system, comprising 13,367 private connections in 1997, distributed most of the water to Nouakchott's population. This direct access to water mainly benefits households in central districts and the built-up outskirts.

The peri-urban poor turn to private operators.

Some connected SONELEC customers living in built-up suburban areas resell their water to neighbors and people living in non-serviced areas.

Standpipe managers (239) supply carters who, in turn, supply water to households in non-connected areas of the city and its outskirts. The sandiest areas are serviced by carters carrying only 1 barrel. Only families living close to standpipes do not use carters.

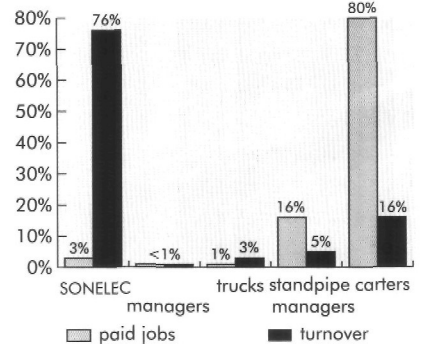
Overhead reservoir managers supply water tankers who supply middle- and high-income households not connected to SONELEC and, occasionally, populations from surrounding villages where carters are unable to go. Municipal water tankers supply communal overhead reservoirs free and are responsible for supplying Government and underprivileged populations.

## Of variable importance in sector turnover, but job-generating activities

The potable water network in Nouakchott has a global turnover of 1,974,504,000 UM. SONELEC is responsible for three-fourths, and water tankers, especially carters, the remainder.

SONELEC, however, only employs 3% of the sector's personnel, whereas private operators employ 96% of remunerated workers. Managers of the 239 standpipes in Nouakchott, helped by their operators, supply almost 2,390 carters.

Potable water



On the other hand, the importance of private operators in the turnover and employment in secondary centers is considerable. More than 190 concessionaires of AEP systems supply the majority of water services to these towns with teams according to the system's size.

The main concern of Nouakchott's population that private operators attempt to respond to is of home water delivery in areas connected to SONELEC and beyond that in the outskirts. Hence the considerable importance of water transporters, carters supplied by standpipes and water tankers supplied by overhead reservoirs.

# Services offered by private operators

## For home water delivery

Potable water operators	Types of services and areas of intervention	Sale price UM/m <sup>3</sup>
<b>Standpipe managers</b>	<ul style="list-style-type: none"> <li>• water sale from buried basins supplied from standpipes connected to SONELEC</li> <li>• supplying carters (200 l. barrels, sometimes cans) in central districts and outskirts; more rarely supplying families living near the standpipe (buckets and basins)</li> </ul>	175
<b>Carters</b>	<ul style="list-style-type: none"> <li>• home water delivery by donkey-drawn carts</li> <li>• average water sale (1 to 2 barrels of 200 l.)</li> <li>• price varies according to distance from water point, amount of sand in the streets, availability of water from SONELEC</li> <li>• operating zone limited by distances and amount of sand in district</li> </ul>	500-750 sometimes 1,500-2,500 in times of shortage
<b>Overhead reservoir managers</b>	<ul style="list-style-type: none"> <li>• water sale to private tankers from overhead reservoirs belonging to CDHLCPI</li> <li>• supply in large quantities (4 to 12 m<sup>3</sup>)</li> <li>• sometimes offering a mechanic's services for truck maintenance</li> <li>• fixed price with payment options, advances on anticipated water sales to buy fuel, tickets for water purchases, restaurants and nearby shops</li> <li>• in the outskirts</li> </ul>	200
<b>Water tankers</b>	<ul style="list-style-type: none"> <li>• home water delivery by used water tankers modified for sandy terrain</li> <li>• potable water supply in large quantities (4 to 12 m<sup>3</sup> cisterns)</li> <li>• price varies according to tankers' maintenance expenses and distance of area to be serviced</li> <li>• in areas not serviced by carters because of distance and sand</li> <li>• mainly to affluent and middle-income families with cement reservoirs, occasionally to villages too far away for carters, and to construction sites</li> </ul>	750 minimum
<b>Connected resellers</b>	<ul style="list-style-type: none"> <li>• retail water sale from a standpipe connected to SONELEC</li> <li>• good quality potable water supply</li> <li>• in all districts, but more specifically in concessions inhabited by several families or tenants</li> </ul>	More than 175
<b>AEP Concessionaire</b>	<ul style="list-style-type: none"> <li>• implementation of extensions and private connections, sale of accessories</li> <li>• retail water sale from standpipes and private connections linked to a mini-system supplied by a borehole equipped with a submerged electric pump</li> <li>• retail potable water supply</li> <li>• one price, monthly billing to private connections</li> <li>• progressively supplying all populations of small centers as the system expands</li> </ul>	70-150 according to the system's size

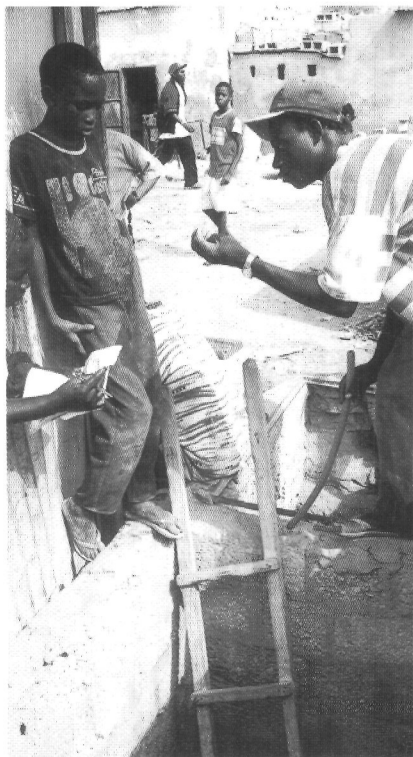
In secondary centers serviced by concessionaires of AEP systems, demand is placed more on installing private connections rather than standpipes progressively abandoned as the AEP system expands.

## Facing supply from public utilities

### Management delegation: an evolving policy



The National Society of Water and Electricity (SONELEC), under the auspices of the Ministry of Hydraulics and Energy, holds a monopoly in production, distribution and commercialization of water in Nouakchott and the main urban centers since 1975.



### WATER TANKERS, HOME DELIVERY IN LARGE QUANTITIES

Given the high demand for home water delivery, private operators have invested in used water tankers modified to drive on sandy terrain. There are about 50 of them supplied by 2 overhead reservoirs managed by the Commission for the Rights of Man, Fight against Poverty and for Insertion (CDHLCPI).

Half of the tankers belong to private water sellers who service the inhabitants of Nouakchott's outskirts: affluent and middle-income families not connected to mains possessing cement reservoirs, poor inhabitants without resources, neighboring villages not accessible to carters that are situated in the East and South axes, and home construction sites.

The other half belong to companies using them for their own needs: fishing companies, Port Authority of Nouakchott, milk industry, building companies. A dozen building company trucks supply their construction sites with water.

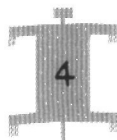
Ten or so municipal trucks supplied by the communal overhead reservoir also supply, non-commercially, water to the Government and other public utilities and some of the city's underprivileged families.

### AEP MINI-SYSTEM CONCESSIONS, A SPECIFICITY OF MAURITANIA

The principle of this "concession" is for an independent operator, after signing a contract with the Department of Hydraulics, to become responsible for the management and maintenance of equipment in the pumping plants.

The concessionaire's main responsibilities, as defined in his specifications sheet, are production, distribution and sale of potable water at prices fixed by SONELEC, everyday maintenance of equipment, financial and technical management of the system, payment of a fee to the Department of Hydraulics and a tax to the municipality.

In Guerou, a secondary center with 15,000 inhabitants, water services are provided by Mohamed El Moustapha, a hydraulics engineer who became the AEP system concessionaire in his village after a public tender. In direct contact with his clients, he responds to the heavy demand for water by employing a team of 10 people, expanding the system between 1995 and 1999 (15 km of secondary and 40 km of tertiary) and installing 1,450 private connections (an investment of 50,000,000 UM). He sells water at 80 UM/m<sup>3</sup> and his monthly turnover is approximately 280,000 UM.





## A STILL LIMITED SUPPLY FROM PUBLIC UTILITIES

### Types of services from SONELEC and areas of intervention

Water sale in central districts and near the outskirts and urban centers

- private connection to households and institutions: connection, bi-monthly billing, 3-level pricing
- standpipes to SONELEC operators and employees of CDHLCPI: monthly billing, one price
- overhead reservoirs to water tankers

### Connection cost

20,000 UM for 10 linear meters  
No security deposit for private connections and standpipes (arrears to be paid by new operator)

### Sale price in UM/m<sup>3</sup>

3-level pricing for private connections  
85 (0-10 m<sup>3</sup>/month)  
168.4 (11-20 m<sup>3</sup>/month)  
211.7 (>20 m<sup>3</sup>/month)  
One price for standpipe and overhead reservoirs: 77.9

National policy consisted of involving local communities created in 1989 in potable water distribution. Town Hall administrators managed the established procedures. SONELEC then delegated standpipe management to private operators who invested in the construction of cement reservoirs (300 to 400,000 UM). Since 1998, however, the management of new

standpipes has been given to young unemployed holders of diplomas employed by the Commission for the Rights of Man, Fight against Poverty and Insertion (CDHLCPI). This step back from the previous policy of delegation applied by SONELEC, leaves SONELEC concessionaires' future uncertain.

On the other hand, it penalizes connected resellers and does not have

a particular policy concerning carters, in spite of their important role in water distribution.

The Ministry of Hydraulics and Energy, through its Department of Hydraulics, is responsible for water services in rural areas and small centers.

One-hundred-and-fifty small AEP systems have been installed since 1982 and 100 power-driven boreholes in



pastoral areas. Village committees, then rural communities, managed them; but in 1993, after the legislation was passed, management was handed over to independent operators, often young, unemployed holders of diplomas. There are 190 "concessionaires" for 260 power-driven systems.

A social policy for pricing and connecting implemented in 1992 is not sufficient to respond to the high demand from populations in the outskirts.

Lack of pressure in SONELEC's pipes obliges standpipe users to draw water with ropes and rubber ladles from buried basins. The same system of buried basins, to a lesser extent, exists in some connected households in many districts. The quality of water suffers in consequence.

Since 1998, however, CDHLCPI, with the city of Nouakchott and UNICEF, is installing a new standpipe model that should allow barrels and buckets to be filled directly from taps connected to an overhead reservoir. They are not yet operational.

## **Perspectives of development in private operators' activities**

### **Nouakchott, a growing city covered in sand, and a multiplication of small centers**



Nouakchott is a city of 700,000 inhabitants in an arid zone. Population growth has been accompanied by the haphazard creation of new peri-urban areas. These badly-equipped areas, as well as surrounding villages,



### **...BUT WATER RESOURCES LIMITED IN NOUAKCHOTT**

Due to aridity (150 mm rainfall per annum) and the distance from the sea:

- no surface water, except the sea where a desalination plant was abandoned;
- saline phreatic table, not fit for either consumption or well usage;
- subsurface table used by 30 boreholes equipped with submerged electric pumps. The Idini field, more than 65 km from Nouakchott on the Road of Hope, is the capital's only supply source.

are difficult to access because of the amount of sand.

Urban growth in Mauritania is also characterized by the emergence and multiplication of small centers that attract many rural dwellers in search of modern facilities and urban services. Population in these small centers, of 3 to 15,000 inhabitants, represents more than one-third of the country's total urban population.

### **Private operators are organizing**

Constraints of legal order leave some private operators' future uncertain: delegation of management rather than real concession to secondary center concessionaires, CDHLCPI employee status for new standpipe overhead reservoir managers, while others have a management contract with SONELEC. The existence, however, of budding organizations around supply sources, and more formally in areas

of maintenance, indicates the development potential for independent operators.

### **Some proposals**

After the conference in Bamako (September 25-29, 1999), representatives from Mauritania identified the following priorities:

- Change legislation so that these operators are officially recognized and authorized to work.
- Open dialogue with the Government concerning fixed prices (competition should determine carters' and water transporters' prices); opt for monthly billing better suited to small operators' and the poorer

population's capabilities; lower connection costs and share with the Government problems caused by delinquent payments.

### **AND SECONDARY CENTERS**

- no surface water except for rivers in some centers;
- sometimes superficial surface table contributing to traditional well supply;
- subsurface table used by boreholes equipped with submerged electric pumps.





## BUDDING ORGANIZATIONS...

Thus, standpipes remain a practically exclusive supply source for carters. They have turned them into parking areas where clients seek them out. In the same way, almost 25 private trucks assemble at the overhead reservoir in the Ksar district resulting in: installation of restaurants and a shop, maintenance of the access road, possibility of installing a telephone. They use intermediaries, "coxers", to deal with clients, have an on-site mechanic and a committee of "wise men" to handle conflicts.

## OR MORE FORMALLY...

Given maintenance difficulties, a private operator founded a business specializing in the maintenance of solar pumps and created an association with other interested operators on a national and sub-regional level. Similarly, 6 AEP system concessionaires in secondary centers of 3 to 15,000 inhabitants formed an EIG to organize their pumping plant's maintenance. Beyond maintenance problems, their association seeks to establish a real dialogue with the Department of Hydraulics.



- Choose water point locations taking into consideration hygiene factors and treat water distributed by AEP operators with chlorine; advise water transporters on initial choices and daily maintenance of their recipients in view of possibly standardizing equipment;

make users aware of service quality and operators of water quality; establish quality standards with the competent services.

- Help in negotiations between operators' associations, lending institutions and banks.



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The Water and Sanitation Program is an international partnership to help the poor gain sustained access to improved water supply and sanitation services. The Program's main funding partners are the Governments of Australia, Belgium, Canada, Denmark, Germany, Italy, Japan, Luxembourg, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom; the United Nations Development Programme, and The World Bank.

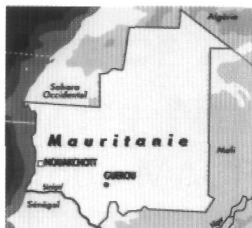
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# CONCESSIONAIRE OF A SMALL TOWN WATER NETWORK

## Guerou - MAURITANIA

Guerou: population 15,000 - 1,000 Ouguiya (UM) = US\$ 0.53



### WATER SERVICE IN SECONDARY CENTERS

- Since 1982, the Water Ministry has installed drinking water systems in secondary centers.
- These systems are operated by village committees, by rural districts, and since 1993, by private concessionaires.
- There are 260 drinking-water networks with motor-driven pumps, of which 190 are run by concessionaires.



Secondary centers (with 3,000 to 15,000 residents) represent more than a third of Mauritania's urban population.

### WATER CONCESSION IN GUEROU

In 1995, a hydraulic engineer and native of Guerou submitted the winning bid and became the concessionaire for the drinking water network for his home town.

His contract makes him responsible for

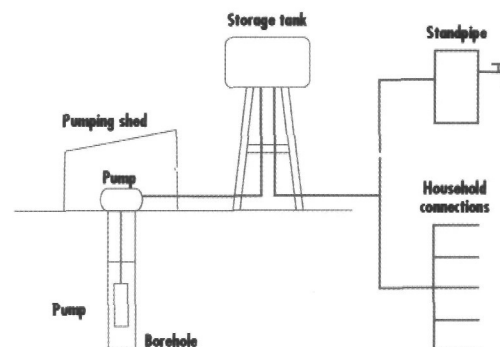
- the production, distribution, and sale of drinking water
- network operations, including upkeep and repair of equipment, and technical and financial management.

He is supervised by the Water Ministry and the town authorities.

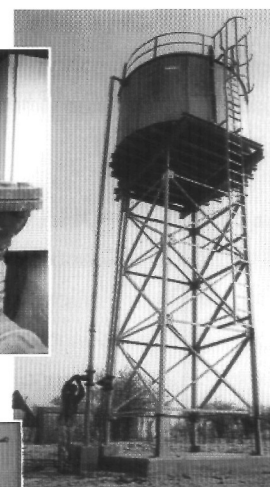
- He pays a fee to the Ministry and a tax to the town.
- His selling price is set by the authorities at UM 80/m<sup>3</sup>.
- His monthly sales volume is about UM 280,000.

### EXPANDING HOUSEHOLD ACCESS TO DRINKING WATER

Between 1995 and 1999, the concessionaire extended the network (15 km of secondary mains and 40 km of tertiary water lines) and installed 1,450 house connections, requiring an investment of about UM 50 million. The concessionaire is in direct contact with his customers, which allows him to stay in close touch with demand trends and to suggest payment arrangements. He has opened a store in his office where water customers can buy supplies such as plastic tubing. He has 10 employees on his payroll.



Routine maintenance and repair of pumping station equipment.



### WATER CONCESSIONAIRES GET ORGANIZED

With their networks continuing to expand, six concessionaires, including the Gerou concessionaire, have organized an economic interest group (GIE) in order to

- speak with a united voice in discussions with the Water Ministry,
- propose revised contract conditions for the concessionaires,
- improve the quality of periodic maintenance provided by the ministry, possibly by contracting with a private mechanic,
- combine orders for spare parts and negotiate for exemptions from Ministries.



Clients can buy plastic tubing and other supplies at the store in the Gerou water office.



Network extension works and installing house connections.



# TRUCK VENDORS OF CITY WATER

## Nouakchott - MAURITANIA

Nouakchott: population 700,000 - 1,000 Ouguiya (UM) = US\$ 0.53

### NOUAKCHOTT'S TRUCK VENDORS

- There are 60 truck vendors, of which 10 are city operated and draw water without charge from the city water raised storage tanks, and 50 are privately operated and draw water from two other raised tanks.
- Of the 50 private water trucks, 15 are operated by companies for their own use, 10 are operated by construction companies, who sell water left over after supplying their construction sites, and 25 trucks are operated by residential water vendors.



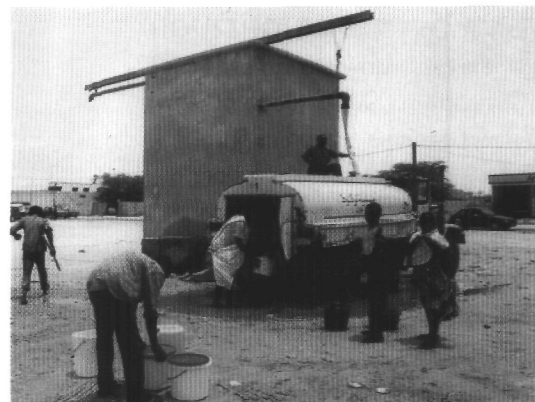
Nouakchott, a desert city, has unplanned settlements at its periphery and nearby desert villages that lie beyond the reach of the city water network.

### HOUSEHOLDS FAR FROM ALTERNATIVE WATER SOURCES

Thirty-five private water truckers with vehicles fitted for driving on sand sell water to about 20,000 residents (3 percent of households):

- living in houses equipped with concrete cisterns not connected to city mains,
- living in nearby villages that are inaccessible to carters,
- and to residential areas under construction.

They also serve settlements along the highways leading into the city from the east and the south, where there are no wells.



City water trucks are assigned to provide free water to municipal offices and low-income areas.



Thirty-five to 50 water trucks a day fill up from a storage tank managed by a staff member of the Human Rights Commission for Fighting Poverty and Promoting Social Integration (CDHLCPI).

### A MICROENTERPRISE THAT DISTRIBUTES WATER

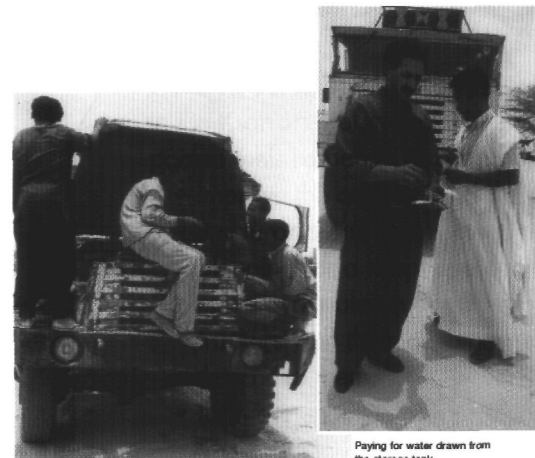
Most water vendors own a single truck, some own three or four.

- A second-hand truck (8 m<sup>3</sup> capacity) costs about UM 2.5 million.
- Water from the storage tanks costs UM 200/m<sup>3</sup>.
- Water sells for 850/m<sup>3</sup> on average, depending on vehicle maintenance costs, the carrying capacity of the truck (4-13 m<sup>3</sup>), and the distance of the delivery location.
- Average annual sales volume for an 8 m<sup>3</sup> truck is UM 3,150,000 for about 525 delivery trips/year (one or two round trips a day).

### AT THE WATER TANK, THE TRUCKERS GET ORGANIZED

In the Ksar area of Nouakchott, nearly 25 private water truckers have pooled their resources in order to:

- improve the area around the water tank where they fill up, building restaurants and shops, keeping the access road maintained, and planning for a telephone connection;
- make available an agent who acts as an intermediary for the truckers with their customers and with vehicle repair mechanics when they need them;
- form a committee of four elders who mediate conflicts between truckers.



A storage tank operator has persuaded a mechanic, an electrician, and a tire repair specialist to set up shop near his tank in response to the tankers' request.

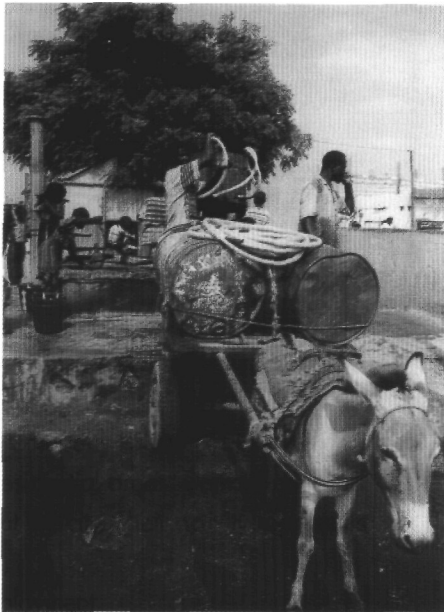
Paying for water drawn from the storage tank.



# DONKEY-DRAWN WATER CARTERS

## Nouakchott - MAURITANIA

Nouakchott: population 700,000 - 1,000 Ouguiya (UM) = US\$ 0.53



When piped water pressure is low, barrels are filled from underground storage tanks, fed from the public network.



Nouakchott, a desert city, has unplanned settlements at its periphery and nearby desert villages that lie beyond the reach of the city water network.

### MORE THAN A QUARTER OF HOUSEHOLDS SERVED BY CARTERS

The National Water and Electricity Company (SONELEC) serves only the downtown area and planned residential areas. Donkey-powered water carts deliver water throughout the city. Their activity represents:

- 16 percent of total water sales,
- 80 percent of water sector employment.

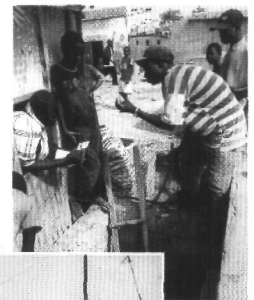
### YOUNG RURAL MIGRANT ENTREPRENEURS

Most water carters are young men with little schooling who work full-time in this recently developed service. There are three types of carters:

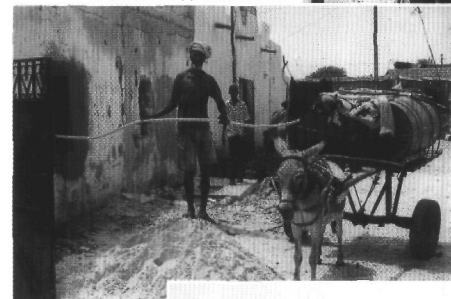
- the hired hands, paid UM 9,000/month (3 percent of carters)
- the cart leasers, who receive half of the daily take and pay for upkeep of cart tires and for donkey fodder (11 percent of carters)
- the cart owners, who have invested UM 28,000 for the cart, the donkey and two water barrels (86 percent of carters)

It is a profitable business:

- Cost of water: 175 UM/m<sup>3</sup> or 35 UM/barrel
- Average selling price: 625 UM/m<sup>3</sup> or 125 UM/barrel; varies depending on the distance from the standpipe, how much sand there is on the roadways, how available SONELEC water is at the time.
- Daily average sales volume: 1,400 liters/day (7 barrels).



Water at the standpipe costs 175 UM/m<sup>3</sup>



Water delivered to a residence or construction site costs 625 UM/m<sup>3</sup>.

### AT THE STANDPIPES, CARTERS GET THEIR WATER AND GET TOGETHER

- Except for a few nearby poor families, only carters may draw water from standpipes.
- But clients may stop by to place their orders with carters parked around the standpipes.
- An improved standpipe model allow barrels to be filled directly from taps connected to raised storage tanks.



An improved standpipe model located near a conventional one.