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ENVIRONMENTAL POLLUTION PROBLEMS OF SMALL COMMUNITIES IN THE NIGER DELTA

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ABSTRACT

This paper discusses the seemingly negligible but important environmental problems of the small communities in the Delta region of Nigeria and stresses the need to introduce measures that will make the inhabitants conscious of the preservation of the environment as a means of checking the occasional outbreak of diseases such as cholera. Some simple measures and systems are suggested which if introduced will go a long way towards improving the quality of the environment in these communities. The author concludes that the achievement of the objective depends much on the simplicity of the system and their effective management.

INTRODUCTION

In nearly all the developing countries the world over, finances are generally so stretched that social amenities are the prerogatives of the capital cities and a few other urban centres. Pipe-borne water, electricity, solid waste disposal systems even where provided are usually a far cry from what a well organized system should be. The constraints on finances imposed by national priority development projects and technological limitations in these countries have sort of 'doomed' the rural communities to a state of utter neglect.

The plight of the small communities living in the delta areas of the Niger river as it empties into the Atlantic ocean is worth giving some consideration. Perched, as small fishing villages, on the higher levee soils along the banks of the numerous meandering rivers and creeks, the inhabitants seem resigned to fighting their annual battle against the ravaging floods and destructive erosion. While in some areas, houses have been built on stilts because of the floods, in other portions of the delta region some sections of villages have been forced to either retreat to lower grounds more susceptible to flooding or to move to areas less

threatened by erosion. Such is the magnitude of these natural hazards that the evolution of any large communities in the region have been greatly hampered. The problems of flooding and erosion coupled with the remoteness of the region and the difficulty of transportation which is only by river craft or dug out canoes, will continue to retard the pace of any meaningful development of the region. This paper however is not intended to suggest solutions to the enormous problems of flooding and erosion, but to draw attention to the comparatively negligible but important problems of water supply and environmental sanitation of the riverine communities. Finding simple solutions to these problems will greatly enhance the health of the people. The first part of the paper discusses the water supply and pollution aspects, while the second part touches briefly on the solid waste disposal and air pollution aspects. In the concluding section, the planning aspect as a means of ensuring a healthier and more attractive environment is discussed. Although examples have been drawn from the Rivers State, the delta communities referred to in this paper can be found in the Cross Rivers, Bendel and Ondo states of the Federation of Nigeria. The population of such communities range between 100 to more than 5,000 inhabitants.

WATER SUPPLY AND POLLUTION ASPECT

Lack of potable water supply and proper sanitation practices are two environmental problems common to the communities of the delta. In the freshwater zone of the region, the groundwater is highly mineralized while the coastal and mangrove areas experience the problem of salt water intrusion. Most of the communities rely on the collection of rainwater in drums or other small containers for domestic use during the wet season. In some areas, shallow wells tap the infiltrated rainwater which overlays the local groundwater, but this too becomes unsuitable for drinking when the salt or mineralized water resurfaces after such infiltration water is exhausted. All the communities however depend on the rivers and creeks as the only sources of water during the dry season which normally extends from about

December to March.

The most disturbing aspect of the use of the river water for domestic purposes is that the quality is highly questionable because the same river receives the untreated human wastes of the communities. The common practice is to build family privies supported on wooden columns and protruding from the banks over the water courses. In the larger communities, a series of these privies line the banks from one end of the village to the other with a good number of them located immediately upstream of where water is withdrawn for domestic use by those living downstream. This method of waste disposal is particularly dangerous in the creeks where the waters remain relatively stagnant with little or no mixing and replenishment during the dry season. The reported cases of the outbreak of cholera in these areas usually coincide with this period of the cessation of rainfall and scarcity of good drinking water when the communities are forced to resort to the polluted streams as their only source of water supply.

The need for a healthy environment has for a long time past been realised by the various communities, hence the practice of collection of rainwater for domestic use and the provision of family facilities for the disposal of their human wastes. A community organised water supply scheme is imperative for the elimination of water-borne diseases in the area. Even where it is possible to obtain drinkable water from shallow wells, the high water table and water logging conditions precludes the simultaneous use of these wells and privy pits or septic tanks for the disposal of human and domestic wastes. Some attempts have been made to provide water from boreholes in both the freshwater and coastal areas but many of these had to be abandoned because of the poor quality of the water. The use of river water for domestic purposes would involve costly and sophisticated treatment plants which the communities can ill-afford to maintain at the present economic level of subsistent living conditions. The use of rainwater seems to offer the cheapest, less complicated and the most reliable alternative of all the water supply schemes attempted in the region under consideration.

The only attempt in this region to provide a working community with rainwater is the Peremabiri water supply project which has so far been successful in providing enough water to tide over the entire dry season. It consists of two underground storage tanks of total capacity 970 m³ (200,000 gallons) in which rainwater is collected via down spouts from the guttered eaves of the roofs of a rice mill with a total roof area of 929m² (10,000 sq. ft.). An overhead tank (13.65 m³), a pump and distribution lines complete the water supply system. The design was based on an average annual rainfall of 3430 mm (135 in.). The simplicity of the system makes it an attractive alternative as a water supply

scheme for such small and remote rural communities. Table 1 gives the average annual rainfall and the seasonal distribution in some selected towns of the area. The table shows that there is abundant rainfall to meet the needs of the communities. The major problem is the provision of collection and storage facilities to meet the demands of the community during the dry season

Table 1 :

AVERAGE RAINFALL (MM) FOR SELECTED STATIONS IN THE NIGER DELTA

MONTH	BONNY	OJOBO	PEREMABIRI	YENAGOA
JAN.	102.4	71.1	54.5	31.1
FEB.	142.9	45.7	143.9	120.4
MAR.	194.1	236.2	140.4	132.8
APR.	350.8	345.4	354.4	212.3
MAY	320.4	429.3	270.9	247.1
JUN	736.6	535.4	416.9	345.7
JUL	411.3	533.4	255.8	256.5
AUG	628.5	292.1	408.6	250.0
SEP	684.8	520.7	439.3	429.8
OCT	646.5	553.7	416.0	322.9
NOV	309.2	368.3	261.8	106.0
DEC	115.8	81.3	46.9	48.8
MEAN ANNUAL RAINFALL	4622.9	4013.1	3203.2	2506.8

For a fairly large community, it may be necessary to have several catchments and storage tanks. Where the community can afford it, the individual tanks may be buried underground and all interconnected to one overhead tank and pumping plant for distribution. Otherwise it might be necessary to have several overhead tanks each serving the conglomeration of houses from which the rainwater was collected. With regards to the

smaller settlements, it will be unwise to design a system requiring the use of a pumping system to raise the water to an overhead tank for distribution. It would be preferable to install a supply system that will lead the water from the catchment directly into elevated storage tanks so that distribution will be by gravity flow only and the maintenance will not be more than occasional cleaning of the storage tanks. If it becomes necessary to supplement the rain water with river water for domestic use, sand filtration units could be built close to the points of withdrawal. This could be followed by coagulation with small doses of alum and chlorine to render the water fit for consumption. A type of arrangement for the distribution of such water by gravity flow is also recommended for the smaller communities.

SOLID WASTE AND AIR POLLUTION PROBLEMS

The problem of solid waste disposal in these small communities is not very acute. For one thing, the quantity of waste produced per household is quite small, and secondly the type of refuse generated in these areas is mainly organic in nature. A cursory examination of the waste in one of the communities revealed some rags, fish bones, plantain peelings and corn husks, sea shells, coconut and palm kernel shells, broken glassware, paper cartons etc. These are usually disposed of in the nearest convenient places or bushes surrounding the houses. While waste disposal is presently not a serious problem, it creates unsightly conditions and odours and is likely to attract flies, rodents, cockroaches and other disease spreading vectors.

Careful consideration must be given to an early organised system of refuse disposal in anticipation of improved economic situation of the people with the resultant better purchasing power of items which are usually more difficult to dispose of. An open dump suitably located away from the residential areas in which the refuse is occasionally burnt would be preferable to the present habit of indiscriminate disposal. With the recent attention to rural areas through the creation of local government authorities some of these communities may well be centres of activities in the not too distant future.

It would appear that it is unnecessary to even mention pollution in any discussion relating to rural communities in the developing countries since there are no industries to pollute the air in these areas. Yet, every day the inhabitants, mostly the women and children, are exposed to intolerably high concentration of smoke from the kitchens. The wood used as fuel for cooking gives out such smoke in the small, poorly ventilated kitchens that would make the concentrations of particulate matter, and carbon monoxide in the much publicised 1952 London smog and Donora Valley smog a child's play, especially during the rainy season when the kitchen

windows are often locked. Sometimes the entire family is exposed to this smoke as either one room of the house or the corridors usually serve as the kitchen. Available records show a high rate of infant mortality, about 20% on the average, in these areas. Respiratory infections as a result of such air pollution may well be one of the many causes of the high infant mortality. It is not unlikely that cases of lung cancer, bronchitis and other respiratory diseases are common among children and women in these areas, because of the long term effect of inhaling the kitchen smoke. Provision of well ventilated fireplaces to ensure more complete combustion and the entire separation of the kitchens from the living rooms will reduce the degree of exposure to high concentrations of smoke.

CONCLUSION

Various suggestions on the improvement of the water supply and sanitation practices in the delta have been made in this paper. Emphasis has deliberately been laid more on the design of simple systems that can function with minimum of attention than on complicated but technically sound systems because of the problems of the availability of competent personnel to manage the systems.

Much can be achieved through careful planning in the task of making these areas more attractive to live in. Because land is a premium in these areas, there is an urgent need to evolve a land use zoning system whereby certain areas are allotted to specific uses. From the onset, industries must be located in areas where their effluents can be taken care of either by treatment or otherwise to avoid creating adverse pollution problems for the communities. If for example, the use of rainwater is contemplated, the communities must draw up guidelines as to the type of houses that should be erected in order to provide for the collection and storage of adequate rainwater. It is through such planning and involvement of the communities in the organisation and management of projects that the objectives of providing a better environment could be achieved. In conclusion, it is recommended that the project of collection and use of rainwater as the source of water supply on a community level be given serious consideration, as this would be a step forward in the effort to make life worth living in these areas.

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