

# BASIC SANITATION AS A FACTOR IN ECONOMIC AND SOCIAL DEVELOPMENT <sup>1</sup>

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*Along with general observations on the importance of sanitation to economic development, the author discusses sanitation conditions in Brazil and points up the major problems faced by the country for lack of a general basic sanitation program.*

The importance of basic sanitation has been acknowledged from time immemorial, and the remarkable accomplishments of the past in this field are, even today, an object of great admiration.

Historians have noted that every major civilization has marked an era of important advance in sanitation. Such importance was attributed by the Romans to their waterworks that after each of their conquests they proceeded to establish water supply programs on a priority basis as a condition for the progress and well-being of the new colony.

In modern times, the construction of sanitation facilities assumed new momentum after the middle of the last century.

In Brazil, basic sanitation has passed through successive stages in which periods of intensive interest in the subject have alternated with others in which a secondary role was assigned to it. Thus, we had an auspicious start in this field at the time of the Empire, a golden age during the First Republic, and a number of less significant efforts in recent decades. Strange as it may seem, a general basic sanitation plan for the country has never been prepared.

The result is that Brazil today has the largest population in the western world that continues to lack minimal sanitation

facilities. Actually there are two Brazils: one inhabited by a minority with access to basic services, and the other consisting of the bulk of the population who live in hopes of better days.

While the country engages in such activities as launching rockets into space and carrying on atomic research, the major problems that afflict our countrymen and decimate the population are in obvious need of attention. It is imperative that we face these age-old problems once and for all and as objectively as possible.

In spite of the deficiencies of our vital statistics, it is possible to arrive at a rough approximation of the very sizable losses sustained by Brazil in terms of deaths, reduced life expectancy, disease, loss of productive capacity, etc.

More than 20 years ago an engineer named Edmund G. Wagner estimated that 200,000 Brazilians a year were falling prey to diseases resulting from the lack of proper sanitation. Brazil's population at the time was only one half what it is now.

Paradoxically, we may note that the means for preventing and eradicating such diseases are simple and perfectly well known and that their application requires no new research or discoveries.

An example of what can be done by putting a simple sanitary measure into practice is found in the experience of the city of São Paulo, where chlorination of the

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water supply was ordered by the Public Health Service against the wishes of most engineers with responsibilities in this field. In São Paulo, when treatment of the water supply was begun in 1926, the mortality rate from typhoid fever was 50 per 100,000. The rate was gradually reduced and by 1950 it was less than 2 per 100,000. It can be estimated that in a period of 40 years 10,000 persons were saved from typhoid fever alone.

Professor A. Prescott Folwell was one of the first sanitarians to evaluate the benefits of basic sanitation in economic terms. Almost 50 years ago he estimated that in the United States each death from intestinal disease represented another 10 cases of the disease. Each case of the disease cost US\$100 in terms of treatment and loss of time on the job. The average economic value of a human life was estimated at US\$1,500 until age 5, rising to US\$7,500 between 25 and 30 years of age and falling to US\$1,000 between 65 and 70. Since death occurred in different age groups, Folwell reckoned the average value of each life lost at US\$3,500.

If Folwell's figures are applied today to a city of 500,000 inhabitants, without taking into account the decline in the value of the dollar caused by inflation, and if it is assumed that basic sanitation works can reduce the death rate by as little as 5 per 1,000, the resultant savings in terms of health and human life would be as follows:

$$\left( 500,000 \times \frac{5}{1,000} \times \$3,500 \right) + \left( 500,000 \times \frac{5}{1,000} \times 10 \times \$100 \right) = \text{US\$}8,750,000 + \text{US\$}2,500,000 = \text{US\$}11,250,000$$

The basic sanitation works would cost about US\$50 per capita, or US\$25,000,000 for 500,000 inhabitants, which means that in only two years their cost would be recovered entirely through the savings in terms of reduced incidence of disease.

Even disregarding humanitarian considerations, it is possible to demonstrate objectively the practical desirability of sanitation works.

Edmund G. Wagner and Luis Wannone

conducted an interesting evaluation study of sanitation programs for Venezuela more than 15 years ago (1). These noted engineers reached the highly significant conclusion, among others, that from the economic standpoint alone, without considering the human side of the problem, each bolivar invested would yield a return of 8 bolivars and that a continuing loss of life was a waste that no country could afford indefinitely, since it represented a loss of human capital, the most important of all resources.

Another paper, which has become a reference work in the field, is the monograph prepared by the distinguished sanitarian Dr. C.-E.A. Winslow for the World Health Organization, published under the thought-provoking title *The Cost of Sickness and the Price of Health* (2). Winslow points out that the impressive results achieved in the field of sanitation over the last 100 years can be attributed to the recognition of the fundamental and constant correlation between sickness and poverty. The pioneers of sanitation found that poverty and disease formed a vicious circle in which men contracted disease because they were poor, became even poorer as a result of the disease and were further broken in health because of this very poverty. This explained why countries with sufficient resources to invest in public health were receiving excellent dividends in terms of able-bodied manpower.

Since not all countries could afford to make these investments, we are confronted even today, in the second half of the twentieth century, with the same problems that were encountered more than 100 years ago, despite the fact that now, as in earlier periods, it is acknowledged that communities cannot continue to exist half rich and half poor, half sick and half healthy. Nor is it reasonable to expect a lasting union among nations when there are peoples whose

health and well-being are undermined by poverty and disease.

Turning now to the situation in Brazil regarding sanitation, we are forced to acknowledge the following alarming conditions: of every three Brazilians at least one is suffering from a serious disease.

Of the 2,300 Brazilian cities and towns with more than 1,000 inhabitants, only 1,700 (58 per cent) have public water supply facilities, most of which are inadequate.

In the capital of São Paulo itself, the number of persons not served by the water supply system has increased as follows:

1940— 400,000 persons

1950— 700,000 persons

1960—1,200,000 persons

The sewerage situation in Brazil is even more serious: only 25 per cent of the urban population is served by public sewerage facilities. Several state capitals are still without sewerage networks. In the cities that do have such systems, the sewerage network serves only a minority of the population.

Schistosomiasis has been reported in new areas of the country and its spread is regarded as a very serious threat.

Faced with this sad state of affairs, the uninformed might argue that the situation is the same as in all of Latin America and find consolation in the assumption that "we are all in the same boat." But this would not be true and, even if it were, would hardly justify our own backwardness. By 1950 Uruguay had completed public water supply systems for all its cities. In other Latin American countries extensive and promising sanitation programs are under way.

It is time, therefore, that we "open our eyes" and "get to work," beginning by recognizing the problem in all its magnitude and significance and proceeding from there to urge the responsible authorities to launch large-scale and realistic programs immediately.

It is clear that our social and economic development is closely tied to the success of

such measures, since a healthy nation cannot be built on a foundation of diseased and impoverished individuals.

There can be no health without basic sanitation and no prospect of economic development without health.

A very interesting research paper has just been published by Taylor and Hall (3), from which we should like to cite some excerpts:

No problem in international health is as important or as poorly understood as the complex interrelationship between health, population growth and general economic development. . . . Until recently, health officials used their ability to reduce mortality as a major criterion of success. . . . Today, statistical analysis of data from many countries shows a strong correlation between per capita income per se and decreased mortality.

For many years engineers attempted to conduct educational campaigns based entirely on humanitarian and public health considerations; these efforts were not successful. The years went by and the country entered the era of development, in which arguments for sanitation assumed considerable greater strength: water is a fundamental factor for development in every sector of production and in every aspect of productivity.

It is impossible to contemplate industrialization without water. To manufacture one kilogram of paper, 200 kilograms of water are needed; to produce one kilogram of steel, 300 kilograms of water are required, and to manufacture a single automobile, 10 tons of water are used.

Basic sanitation offers the following immediate benefits:

- 1) Improvement of health conditions and, accordingly, of workers' efficiency.
- 2) Reduction of the number of workdays lost.
- 3) Lengthening of the economically productive period of life; expanded and improved utilization of trained manpower.
- 4) Development of the water industry itself and of industries manufacturing sanitation supplies, tubing, chemicals, etc.
- 5) Creation of new employment.

In 1965 the Pan American Health Organization brought together a group of experts in Washington to evaluate the status of water supply in Latin America. One of the conclusions reached unanimously by the group refers to the effect of water supply on social and economic development (4).

The meeting acknowledged that there were difficulties in making a fair and complete evaluation of the effects of sanitation. In a few words, professors Fair and Geyer expressed the problem as follows: "Unfortunately, there are no ready means for measuring human comfort and well-being, whereas sickness and death are determinable facts."

We cannot conclude this discussion without presenting a few brief observations regarding basic sanitation. In short, what is basic sanitation? The concept must be dynamic and must be suited to local conditions.

At present, water supply and sewage disposal are very important problems in Brazil owing to the current shortages of facilities. For this reason, water and sewerage must be the cardinal points of any basic sanitation program in our country.

In the fully developed countries these problems are largely resolved but there are others that would play a priority role in sanitation activities.

In other words, it is the prevailing conditions in each country that should determine the type of basic sanitation works required. As long as our enormous lag in this sector of engineering persists, we must not allow other questions of minor significance from the public health standpoint to distract our attention or divert our resources from the primary problem.

A few months ago a survey was taken in the State of São Paulo, which showed once again that the problem of water supply is still the source of greatest concern to the people of the state. We are certain that the same may be said regarding the other states of Brazil.

## Summary

Historians have not overlooked the relationship between the apogee of the great civilizations and the flowering of sanitary works. In Brazil basic sanitation has passed through successive stages in some of which it awakened the attention of the public and of the authorities and in others was relegated to a secondary place. Despite the incompleteness of vital statistics, the data available make it possible to arrive at a general assessment of the extraordinary harm caused in Brazil by diseases due to deficient sanitation and reflected in mortality rates, reduction of life expectancy, limitation of productivity, etc. More than 20 years ago, when Brazil had half its present population, it was estimated that the number of Brazilians who were victims of diseases due to faulty sanitation amounted to 200,000 a year.

It has been calculated that basic sanitation works—including water supply facilities—for a city of 500,000 inhabitants would cost \$50 per capita, or \$25,000,000, but it is also known that in only two years this sum would be recovered as a result of a reduction in diseases and consequently in the losses they cause. This estimate is of special importance for Brazil, where one out of every three persons is suffering from a serious disease, and out of 2,300 cities and towns with more than 1,000 inhabitants only 1,700 (58 per cent) have public water services, most of which are inadequate. In São Paulo, capital of the state of the same name (which had more than 3 million inhabitants in 1960) the number of persons not served by the water supply network has increased at the following rate: 400,000 in 1940; 700,000 in 1950; and 1,200,000 in 1960.

Water supply, which is essential for the protection of human health, is also of crucial importance for industrial development and accordingly for the welfare and prosperity of the nation.

Basic sanitation works produce, *inter alia*, the following immediate benefits: (a) improvement in the general health conditions and therefore in the productivity of the economically active population; (b) reduction in the number of workdays lost; (c) increase in economically productive life and better utilization of skilled manpower; (d) development of industries related to water supply works (sanitary materials, piping, chemical products, etc.); and (e) increased employment opportunities.

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