## The Year in Disasters 1993

# *Nordeste Brazil: an impending disaster*

In Brazil, limited and irregular rains in early 1994 did little to relieve the Nordeste's (or north-east's) long-term crisis of drought or halt the growing vulnerability of the region's poor communities. Four years of low rainfall created widespread food insecurity and water shortages. In some places, annual rainfall in recent years has been less than 20% of normal in a region which is almost totally dependent on reservoirs of rainwater. By mid-1993, most municipalities in the semi-arid region known as Sertao were trucking in drinking water and had launched cash-for-work schemes. The fear for 1994 was of a "green drought", in which the countryside apparantly recovers but rains are insufficient for crops to mature.

The population of the Nordeste has doubled since the 1950s, when drought devastated local farming communities. Since then, a cycle of poor rains, together with growing poverty, mean that 12 million of the region's 42 million people are directly affected by drought, a high proportion even of Brazil's total population, which is estimated at 156 million. Even though many markets in the Nordeste are well-stocked, the majority of people in rural areas have severely-limited access to food, because lack of rain has reduced or eliminated their income from agriculture, seeds appropriate for the region are in short supply, while losses of livestock among small-scale farmers are put at 60%-100% of their cattle, goats, sheep and pigs.

The Sertao of the Nordeste, or what some have called the "Drought Polygon" of Brazil, includes nine states: Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Serguipe, Bahia, Ceará, Piauí, Maranhão and Minas Gerais. These States are situated just south of the Equator and are, therefore, directly affected by cyclical climatic changes in this region. But as so often in supposedly "natural" disasters, such as drought, the lack of rains in northeastern Brazil is merely the trigger for a disaster which could not happen if the people were not already vulnerable for a range of social, environmental and economic reasons.

The Nordeste is a large region of plateaux and low mountains, centred around" the Plateau of Borborema, which lies between latitudes 3 to 12 degrees south and stretches from the Atlantic Ocean in the east to the Amazon basin in the west. The region's economy is based on agriculture, with the growing of cassava, beans and maize besides cash crops (mainly along the coast) and the rearing of livestock. The Sertao, which covers two-thirds of the Nordeste, has few permanent rivers and is, therefore, largely dependent on rainwater.

The Nordeste is the most densely populated area of northern Brazil. Most of its 42 million people are concentrated within 100 km of the coast, and 70% are reported to be living in drought-affected areas. Statistics show that children under five years of age represent close to 20% of the region's population, the highest percentage in the country. This region is also characterised by the highest crude birth-rate in the whole of Brazil and the highest crude population growth-rate.

The discrepancy between the Nordeste and the other regions of the country is well illustrated by the infant mortality rate (IMR) for children aged 0 to one year. In 1986, the IMR for Brazil as a whole was 160 per 1,000 live births, but it was 240 in the Nordeste and 117 in the richer southern region. Since then, greater reductions in the IMR are believed to have occurred in the south than in the Nordeste, so that the gap is still widening. Such inequalities are maintained through life: the national average of child mortality among one- to four-year-olds in 1990 was 60 per 1,000 live births; in the south it was 27.4, but in the Nordeste the figure was 70.7. In 1980 life expectancy nationally averaged 60 years; in the south it was 67 years, but in the Nordeste its was 51 years, and in some parts just 44 years.

One striking feature of Brazilian society is the enormous inequality between the rich and the poor. According to the Economic Intelligence Unit's Brazil Country Profile 1992-93, "There is little doubt that disparities in income have become greater since the mid-1960s, and particularly since 1980." This is particularly true in the Nordeste, where 75% of all children and young people are living in families where the total income is lower than half of the national minimum salary, and most have little access to land

The last period of drought, ending in 1985, resulted in a dramatic increase in rural-urban migration, as people abandoned their small traditional plots to search for work by gathering in the overcrowded suburban "favellas" or shanty towns, which surround every city in Brazil. As many as one million people from the Nordeste have joined this migration, with men going to look for work, while women stay behind as heads of household looking after families and farms.

Those staying behind may have access to some land, but often the soil is of low quality and there is little water. Land is often rented, and there is little security of tenure. The small-scale farmers in the Nordeste frequently complain that land and water, agricultural marketing, credit and technical assistance, and development funds are all dominated by large-scale farmers, while publicly-funded irrigation is mainly confined to one area, benefitting wealthy landowners and agro-industrial companies growing fruit for export.

The rainfall in the Nordeste region has been erratic since at least the time of Portuguese colonisation. In the 16th century, the region was already known as the "zona da seca" or area of drought. Older people recall several droughts in this century, the most recent one beginning in 1983 and ending in 1985. But the drought of 1958 was much more serious, with reports of people dying in the streets of small towns in Ceara state. Other significant drought dates mentioned are 1934, 1919 and 1915, but no precise records were maintained.

Analysis of a century or more of rainfall records in Ceara state reveals two rainfall cycles; over 13 and 26 year periods. The worse droughts occur when the two cycles combine their effects, as happened in 1934, 1958 and 1983

This irregular rainfall has a tremendous impact on the hydrology of the region. Most of the water used in the Nordeste comes from dams and reservoirs where it collects after the rains; some are very large and deep but most are large, shallow ponds prone to fast evaporation. In normal circumstances, rainy-season water covers people's needs adequately but, after two or three years with insufficient rainfall, the situation becomes critical as many reservoirs dry up. Water shortages obviously have a dramatic impact on people's lives and on the fast-widening gap in conditions between urban and rural populations, particularly in their access to safe, clean water supplies.

Access to potable water is one of the most useful indicators used in public health. Nationwide, 70% of Brazilian dwellings have access to potable water but only 12% of the rural homes - even fewer in the Nordeste - have access to clean water compared to 89% of urban homes. This has a direct implication on the health profile of the population.

In the Nordeste, the health situation is very much like any underdeveloped country, with communicable diseases, particularly diarrhoeal ones, most frequently reported as the leading cause of morbidity and mortality among children, followed by acute respiratory infections. Immunisation coverage is high throughout the country but diseases such as leprosy, tuberculosis and leptospirosis are reported with increasing frequently since they are directly related to the poor hygienic conditions which prevail in the favellas and rural areas.

Although it is a vital indicator, the nutritional status of the population (particularly among under-fives) is hard to track, and the region lacks the updated and disaggregated data usually provided by child growth monitoring programmes. Nationally, 16% of under-fives suffer from severe malnutrition and 8% of newborn babies suffer from low birth weight, according to UNDP's annual report 1992, while Unicef's 1993 State of the World's Children Report cites 11% of infants with low birth-weight, 2% of children between 12-23 months suffering from moderate and severe wasting, and 15% of children between 24-59 months suffering from moderate to severe stunting.

In rural areas of the Nordeste, malnutrition is a widespread and frequently overlooked problem. Children who are obviously malnourished are treated only for their dehydration, with no supplementary feeding programme established. As in all developing countries, malnutrition in the Nordeste is the result of a conjunction of several factors which interact to increase their effects.

Scarcity of food, both in quantity and in quality, is the leading factor. Limited access to potable water and sanitation increases vulnerability to diarrhoeal diseases. Finally, a lack of health-care facilities prevents the adequate provision of treatment of dehydrated children and other patients, resulting in unnecessary and preventable deaths.

During the previous famine, the steady decline of infant mortality witnessed in the State of Rio Grande do Norte stopped and the curve was inverted during 1983. The setback which then followed lasted for several years after the end of the drought.

Access to food is the key to the Nordeste's problems. Brazil is a large country and one of the world's largest food exporters. Even during the Nordeste's regular droughts, the remainder of the country has normal food production. After years of drought, small holders in the Nordeste have no more cash to buy the food items which would supplement their diet. One critical element in the drought sequence - poor rains mean poor crops, low income, and hunger - is the lack of boreholes available to the small holders to allow irrigation, even in drought periods.

The recurrent nature of drought in the area has prompted the government to set up a programme of cash-for-work - "emergency work fronts" - in which people on low incomes are employed These consist of public works schemes of digging reservoirs and road or public-building maintenance They are meant to guarantee a small salary - worth the equivalent of US$17-35 a month in 1993 - allowing the most vulnerable access to food and water. In 1993, two million people, with probably another four to six million dependents, were employed on such public works, the importance of which have been increased because of the lack of agricultural work after sugar cane harvests fell 50% in Pernambuco.

Rainfall data at the Marechal Puta dam shows that the most recent decline in rainfall started in 1990 By May 1993, the dam had lost 54% of its total capacity of nearly 42 million cubic metres and the remaining 19 million cubic metres were expected to cover needs for only one more year.

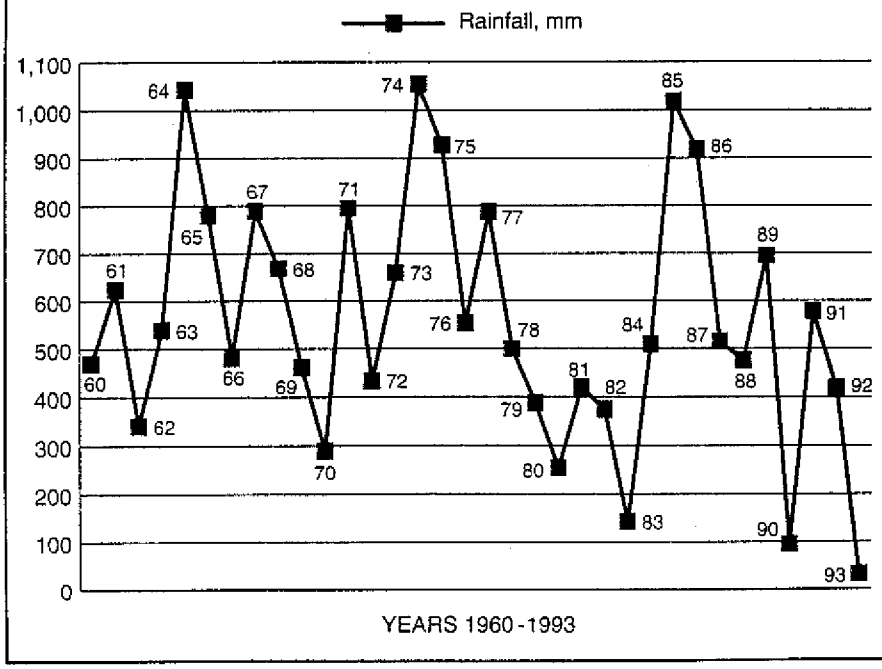
In the State of Rio Grande do Norte, 56 dams have been constructed, but only five still had water in mid-1993, and that supply would not last long. Water distribution has been organised with a huge network of trucks They cover distances of several hundred kilometres per day to serve a mere few litres of water to villagers in remote areas. In some cases, the water delivered by this system is salty and beneficiaries com-

plain of abdominal pains. Rich people can afford to buy potable water from private boreholes dug in the largest farms of the areas.

Because of the drought, a "state of emergency" was declared on 19 March 1993 in Rio Grande do Norte and a few weeks later in Ceará. Programmes for "emergency works" have been initiated by the States affected, but even with the support of the federal government, they cannot offer more than few hundred kilocalories to the already-depleted diet. In rural areas, the objective of such assistance is to maintain one meal a day, if possible, consisting of staple foods, such as rice and beans, and soup with

**Rainfall in Marechal Puta Dam**

| Year | Rainfall, mm | Year | Rainfall, mm |
|---|---|---|---|
| 1960 | 469 | 1977 | 786 |
| 1961 | 623 | 1978 | 499 |
| 1962 | 340 | 1979 | 387 |
| 1963 | 538 | 1980 | 254 |
| 1964 | 1,041 | 1981 | 419 |
| 1965 | 778 | 1982 | 374 |
| 1966 | 480 | 1983 | 142 |
| 1967 | 788 | 1984 | 508 |
| 1968 | 667 | 1985 | 1,018 |
| 1969 | 460 | 1986 | 918 |
| 1970 | 289 | 1987 | 514 |
| 1971 | 794 | 1988 | 475 |
| 1972 | 432 | 1989 | 694 |
| 1973 | 658 | 1990 | 95 |
| 1974 | 1,054 | 1991 | 577 |
| 1975 | 927 | 1992 | 418 |
| 1976 | 552 | 1993 | 31 |




*Rainfall trends in northeast Brazil show distinct cycles. The drought of 1983 was proceeded by almost a decade of declining rainfall. The drought of 1993 follows on from eight years of low rainfall levels.*

Source:Local meteorological records

sugar cane and bread.

Among the public works initiated are the maintenance of dams, repair of roads and the running of the small reservoirs from where water is usually distributed. Significantly, the increasing presence of rural unions has reduced previous misdirection of public funds into work creation programmes providing big private farmers with reservoirs, dams and irrigation schemes.

Local economics and politics mean that cities are less affected by the shortage of water and therefore the tendency for rural people to leave their isolated farms or small villages and flock around larger and larger cities is exacerbated. If good rains do not return, the 1983 images of people begging along highways throughout the Nordeste can be expected to return in future years.

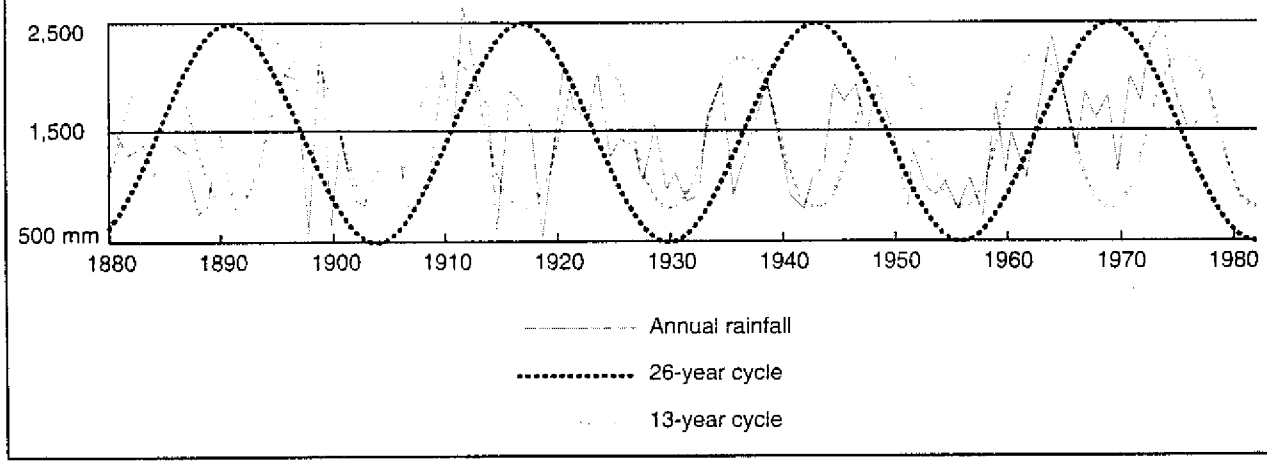
Raids on food warehouses and supermarkets were reported in many places in the Nordeste in 1993, something which is expected to increase as community resources are exhausted, while the offices of Sudene, the regional development authority, were twice occupied by hundreds of farmers demanding work-creation schemes. Although the federal government agreed to finance cash-for-work schemes in the wake of the first occupation, there are fears in 1994 that a short-term improvement in rains will mean cuts in assistance.

So far, the burden of drought has been shared through community mobilisation, with Christmas 1993 offering an opportunity for a campaign raising cash and food so that "nobody will suffer from hunger at Christmas". There has been concern in Brazil that the drought has received little publicity, either nationally or internationally, and criticism of the pace and scale of government response. In 1994 the Federal and State governments are expected to increase their assistance to vulnerable people. A consortium of Nordeste NGOs are carrying out programmes of assistance and education but with limited resources compared to the scale of need.

Since 1992, the Nordeste has had to contend with another problem - cholera - which might have devastating consequences if combined with drought. In 1993, the State of Ceará reported the highest number of cholera cases in Brazil and figures were still rising. Information on measures to prevent cholera has been promoted widely but its effectiveness is hard to assess when there is hardly any sanitation programme and safe water is scarce. Lack of water will mean that many more people will rely on polluted water sources, spreading the epidemic. Recent figures from one public hospital, in Ouricuri, showed that one in eight cases of diarrhoea proved to be cholera.

As in most cases of disaster, the affected communities in the Nordeste have been the first to mobilise to cope with the needs. Although limited,

**Rainfall at Fortaleza, north-eastern Brazil, 1880-1977, with smoothed cyclical patterns**



*In north-eastern Brazil, thousands of families face a bleak future as cyclical drought compounds the poverty generated by an inequitable distribution and ownership of resources. In the early 1980s drought caused a rapid rise in the death rate among young children. Today, with higher population figures and more people living in poverty, drought once again threatens to make the difference between survival and tragedy.*
*Brazil, 1983. Sebastiao Salgado/Magnum*