E 3

Production and Uses of CFC Gases*

I Total World Production (mill. of tons)

II Sources of CFCs

Production processes and products

1974: 1.01 mill. tons

1988: 1.25 mill. tons

*CFCs are a category of gases that include chlorine, fluoro, carbon and freon.

Development and Uses of CFCs

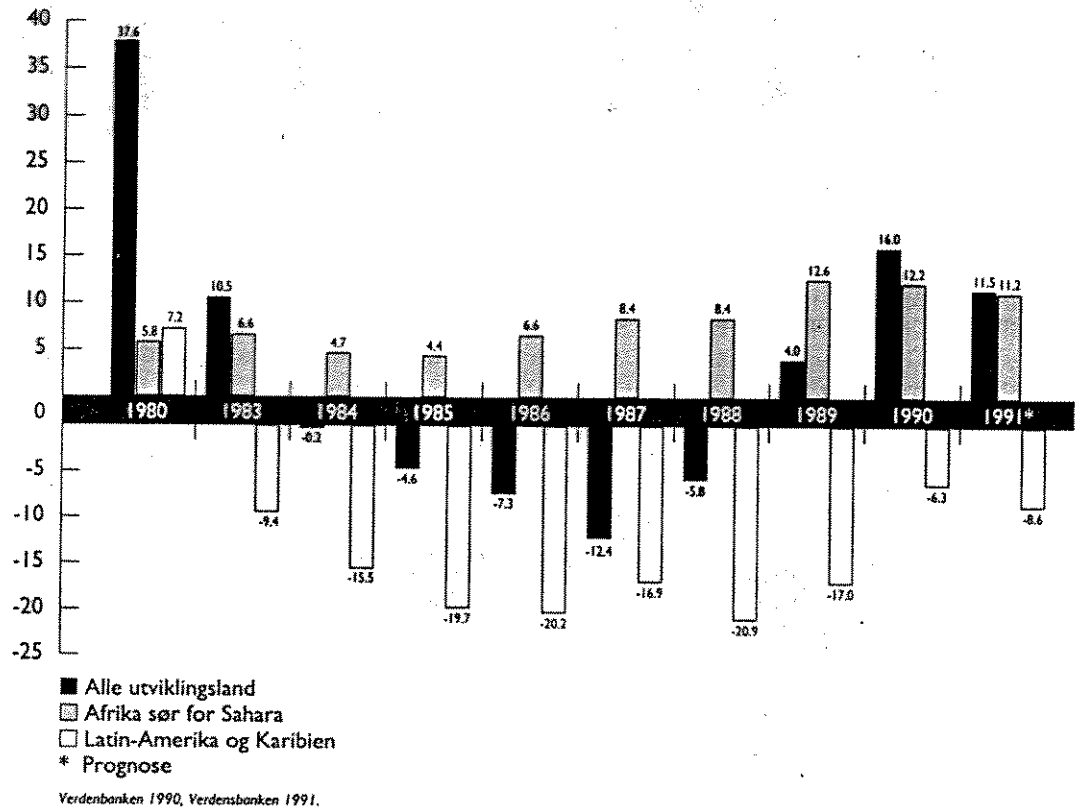
CFC gases have been created by human development activities during the last 60 years. They are involved in industrial production processes and in modern products. Atmospheric CFCs are destroyed only when they reach the higher stratosphere and are slowly dissolved by ultraviolet radiation.

I: World production of CFC gases has increased from approx. 200,000 tons in 1960 to approx. 1.25 mill. tons in 1988. The curve flattens out at the end of the 1970s because damaging effects to the ozone layer became apparent and production was reduced somewhat. Many countries introduced restrictions. In recent years there has again been an increase in the use of CFCs. Currently, CFC concentrations in the atmosphere are growing at about 5% annually.

II: CFC usage has changed from 1974 to 1988. In 1974 69% of the total use of CFCs was in aerosol spray cans. By 1988 the use of CFCs in spray cans had been reduced by 81%. However, the use of CFCs in dry cleaners and detergents more than tripled, going from 6% in 1974 to 19% in 1988.

Total Net transfer of funds from developed to developing countries (through development aid; loans; export credits; direct investment; minus interest and dividends on investments)

Figur 4.5. *Samlete netto ressursoverføringer (bistand, lån, eksport creditter og direkte investeringer minus renter, avdrag og dividender på investeringer), globalt og regionalt. US milliarder dollar.*



Verdenbanken 1990, Verdensbanken 1991.

CARL SILVERT

"The quality of Latin American man and his culture make it difficult for him to be modern!"

GEORGE FOSTER

"Cultural emulation is the only way to inspire rapid development"

Figure 5. The modernist development aid paradigm.

Gro Harlem Brundtland:

If 7 billion people were to consume as much energy and resources as we do in the West today we would nee 10 worlds, not one, to satisfy all our needs.

Agenda 21, Chapter 4:

... the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries...

Amedeo Postigilione (member of the Supreme Court of Cassazione, proponent of an International Environmental Agency and an International Court of the Environment):

Sustainability should not be confused with development. Development is economic and thus unlimited, while sustainability is, strictly speaking, only a characteristic of living systems that are limited. The earth as a self-regulatory and interdependent closed system is similarly limited. We must avoid ambiguity with the term "sustainable development". Sustainability in this expression is simply used as a qualifying adjective and not as it should be as a fundamental concept, the basic reference point. We should not attempt to define the sustainability of our earth in economic terms. Our global ecological system cannot be made to conform to our economic needs and wants. Necessarily, the latter must be defined by the limitations of the former.

Global Warming in an Unequal World

A case of environmental colonialism

Anil Agarwal
Sunita Narain

CENTRE FOR SCIENCE AND ENVIRONMENT

A1

INTERNATIONAL FRAMEWORK – ENVIRONMENT AND DEVELOPMENT

The Present Situation

Our Common Future - The World Commission on Environment and Development
(The Brundtland Commission) 1987

"It is . . . meaningless to try to solve environmental problems without placing them in a broader global perspective and in relation to international differences."

"The debt burden which has assumed such proportions that many countries are unable to make repayment, forces African countries to over exploit their poor soils; the earth turns into desert."

"The military expenditures of many countries consume such a large proportion of GNP that it becomes a great hindrance to national development."

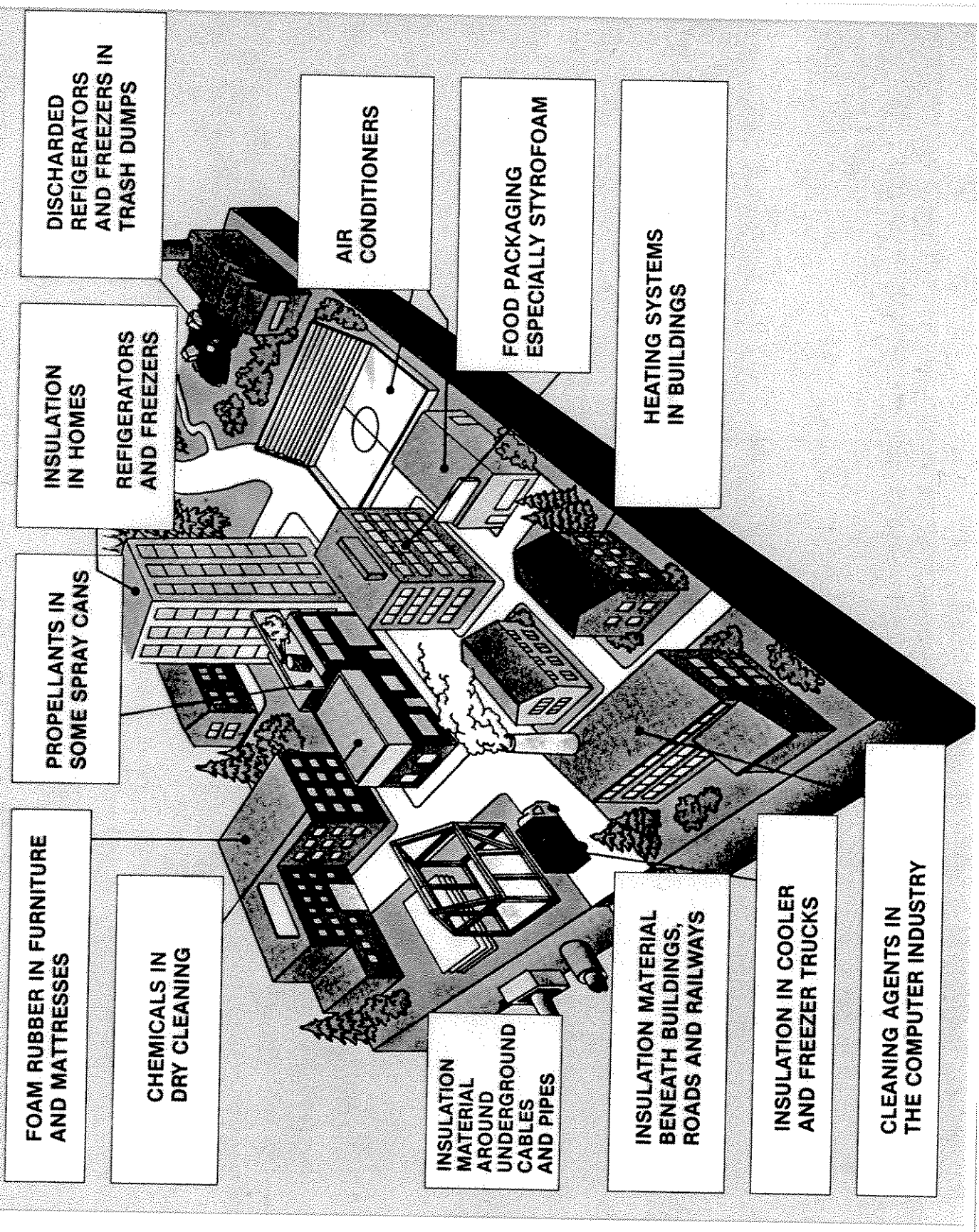
"Every year 23,000 sq. miles of soil becomes worthless desert. More than 42,500 sq. miles of forest is destroyed annually."

"As a result of the debt crisis in Latin America, the continent's natural resources are not being used for development, but for repaying foreign debt."

"This is a world in which the industrialized countries have already used up most of the world's ecological capital. This unjust distribution is the world's most serious environmental problem."

E5

CFC Gases in Our Everyday Lives



Phasing Out CFCs

Chlorofluorocarbon gas was invented in 1928 and has become the foundation for many conveniences of modern life. CFCs are used in several basic processes: insulations, propellants and as cleaning agents. In recent years they had growing use in food packaging because of their strength and ability to cool or keep foods warm - - - really an aspect of insulation. Just as their use has been growing, so has the awareness of their extreme damage to the ozone layer.

Another gas, halon, is extremely destructive to the ozone layer. Halons are used in fire-extinguishers as a propellant.

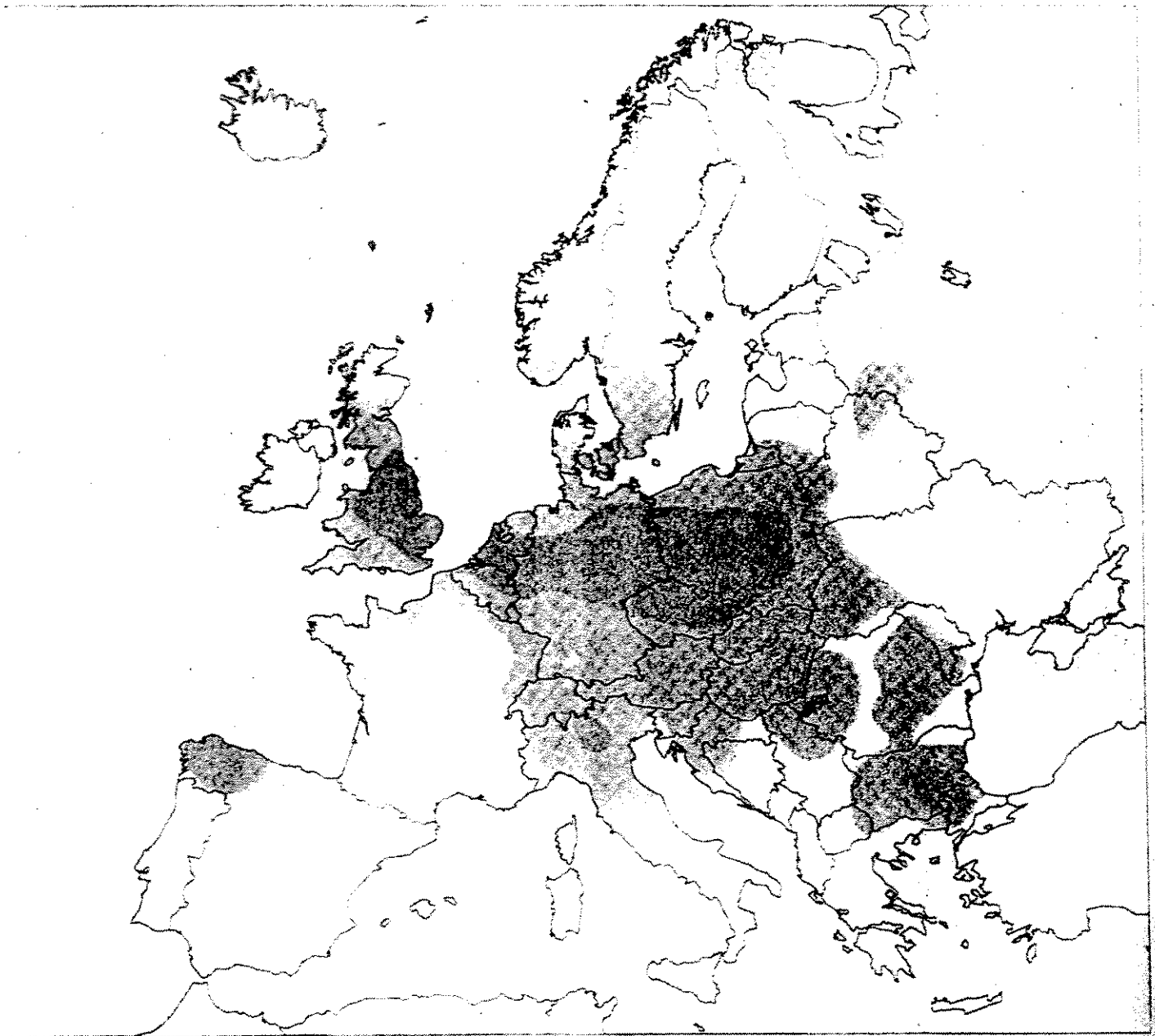
SOLUTIONS: Because CFCs are human-made gases that are not dissolved in the lower atmosphere and cause immense damage to the upper ozone layer, it is urgent that their production be phased out.

Eliminating the CFCs is complicated because modern society is so dependent on the many comforts they provide to daily life. Other gases that can replace CFC gases in many areas are being developed today.

Excess deposition of Sulphur
5 percentile - (23/2-93)

Above 5000
2000 - 5000
500 - 2000
100 - 500
0 - 100
Ocean
No data

Unit: mg/m2 as S pr.year



Produced by: GRID-Arendal 1994 Polar Projection Source: DNMI / EMEP

A 3

Pollution from Inland Waters

2% of the earth's water is fresh water and comes from

- glaciers } 87% of
- ice caps } fresh water
- rivers
- lakes
- Rain
- groundwaters
- soil moisture

EMISSIONS IN TONS PER DAY INTO NEW YORK BAY	
– oil and grease	970
– nitrogen	520
– iron	230
– carbon	2,600
– copper	13.8
– quicksilver	0.3

Sources of Coastal Pollution

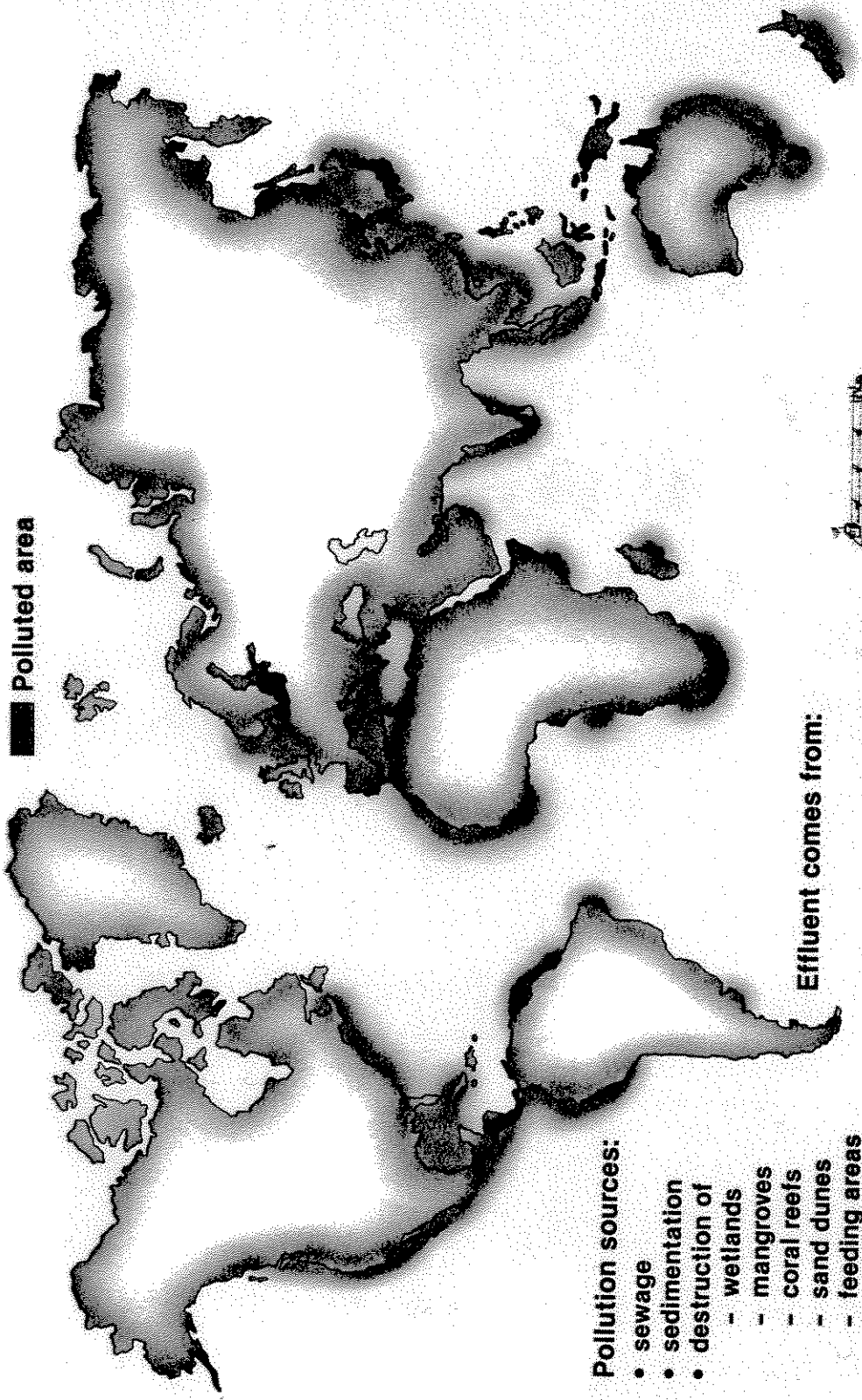
Coastal areas are polluted by runoff from land, sewage, and industrial discharge as well as by industrial and municipal dumping. Eutrophication - - - the overenrichment of waters - - - is widespread and increasing globally. During eutrophication an overabundance of nutrients, mainly nitrogen and phosphorus, cause algal blooms and rapid growth of other aquatic plants. When these plants die, decomposing bacteria can deplete the water of oxygen. All fish and other organisms die.

The major source of nutrients are urban wastes, particularly sewage; fertilizers leaching into the waterways; and wastes from intensive livestock farming. Runoff from the land contributes 34% of the total pollution in U.S. coastal waters.

Coastal waters are increasingly plagued by toxic and nontoxic algal blooms that threaten marine life. The red tide is a special plankton bloom in which the dominant species is toxic. They often kill other marine organisms, damage mariculture production and cause illness and death among humans who eat shellfish that accumulated these toxins.

A 4

Poisoning of the Oceans - Pollution



Ocean Pollution

Most of the refuse produced by human beings, animals and industry end up in the sea – the world's largest sewer. More than 10 billion tons of pollution flow into the world's oceans in the form of silt, clay, sewage, nutrient salts, poisonous chemicals, radioactice substances, oil, etc.

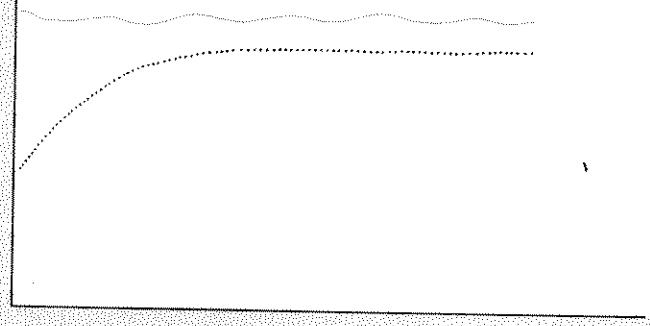
Additionally, coastal habitats and coral reefs are being destroyed by ever growing human populations. The most widespread and serious sources of pollution are sewage disposal and sedimentation from land clearing and erosion.

Most of the world's wastes are dumped into coastal seas, the place containing most of the world's fishing waters. The open sea areas of the world have also been polluted, but to a lesser degree. Discharged plastic bags are found in fish bellies and many fish are killed when caught in plastic sixpack-container rings.

In 1990 a group of experts produced a report for the United Nations that concluded that chemical poisoning and pollution of the oceans are detectable all the way from the Antarctic to the Arctic Ocean.

The Solution - A Sustainable Environment

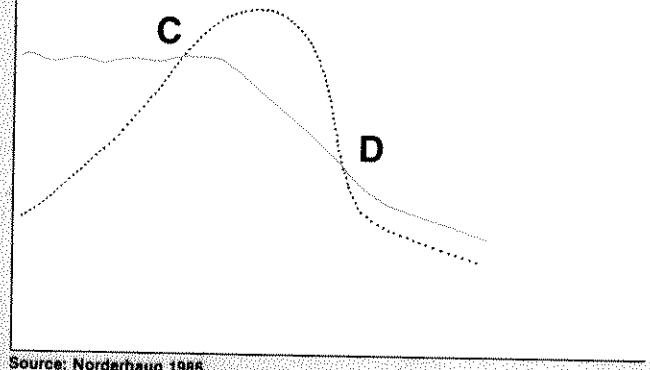
I Sustainable Use of Resources



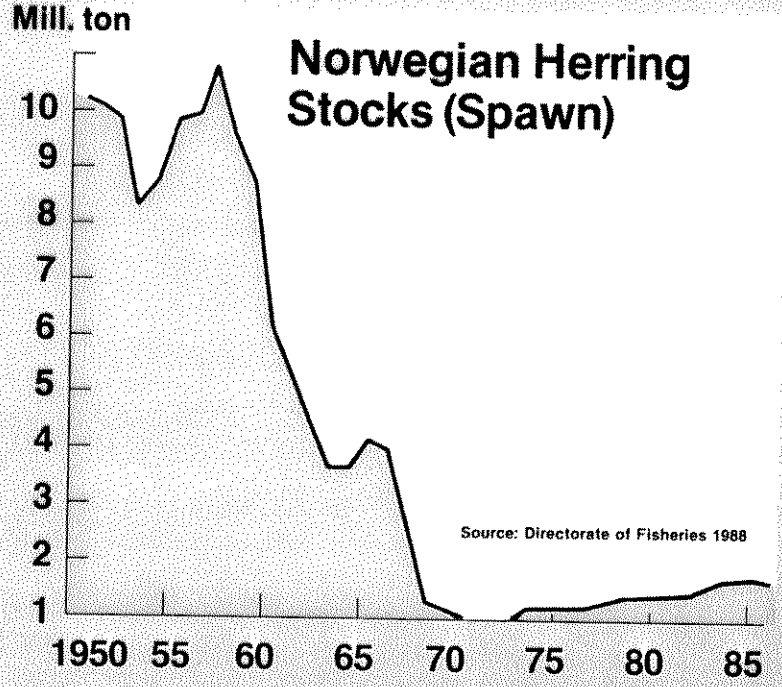
Ecologically sustainable -- what nature tolerates

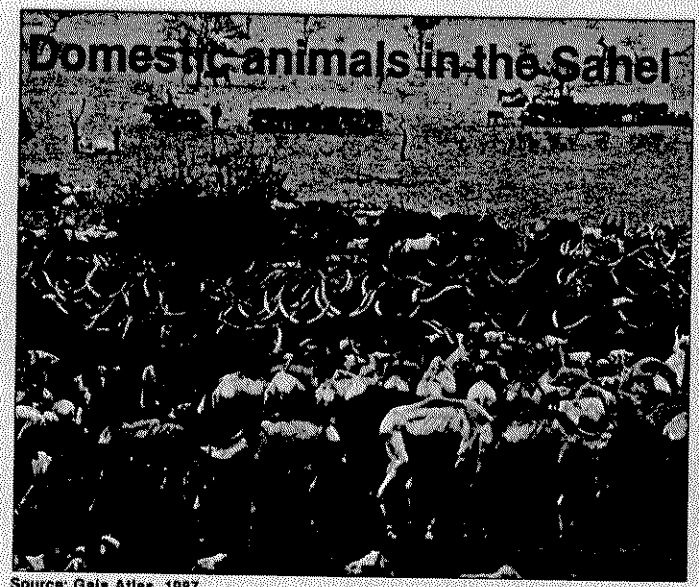
Exploitation of nature - - plants, animals, trees

II Destructive Use of Resources



Source: Norderhaug 1986





Source: Gaia Atlas 1987

The Solution to Desertification/Erosion
Nature naturally regenerates itself. Human activity is now interfering with that process. Sustainable development is using natural resources in such a way that they are not completely destroyed, but can regenerate themselves and thus be available for future use. Chart I shows human use of natural resources that does not destroy nature's ability to regenerate. Chart II shows human activity that overwhelms and destroys nature's ability to renew and recreate itself thereby causing a collapse.

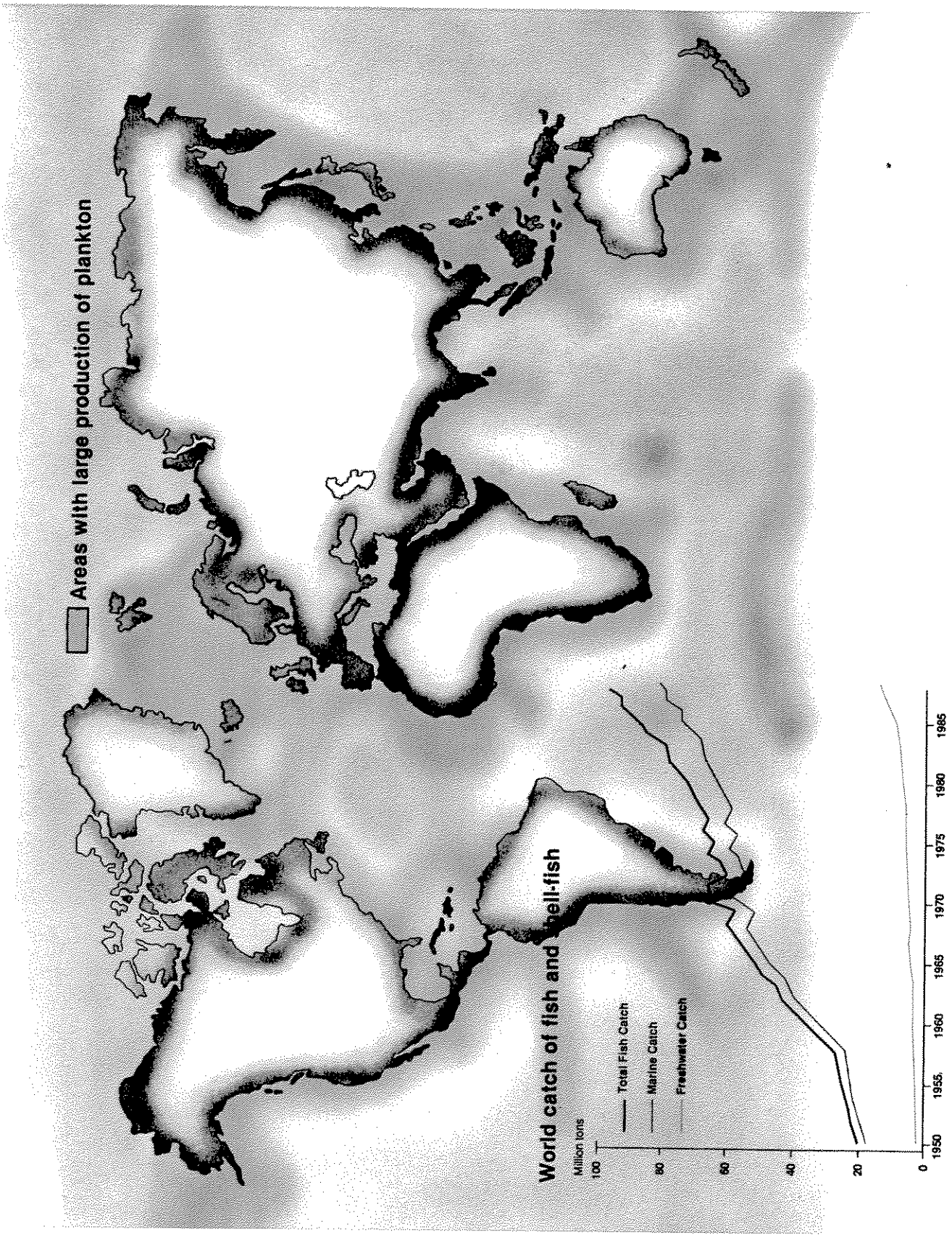
Norwegian Herring Stocks, 1950-85
During the 1950s Norway fished a reasonable quantity of herring - - - herring reproduction was sustained. In the 1960s Norway over exploited the herring stock by taking large amounts. They overtaxed the herring stock's capacity for self-renewal and they broke down. In the 1970s all fishing was stopped and a small stock of herrings was built up again.

Cattle Farming in the Sahel
Too many people and animals have drawn too heavily on the forests and grasses of the Sahel region. The trees and grasses are disappearing and the desert is taking over.

Using more resources than nature can regenerate causes collapse.

A 5

The Living Sea - The Empty Nets



Declining Fishing Stocks

Every year approximately 200 billion tons of vegetable plankton are produced in the world's oceans, most of it in the coastal areas. Vegetable plankton are tiny sea plants who depend on solar energy, mineral salts and carbon dioxide. Vegetable plankton is the nutritional base for all sea creatures and is sufficient to feed 200–400 million tons of fish and shellfish annually. Fishing is abundant in coastal areas because plankton is there.

The map shows areas where plankton production is greatest, and where the world's fishing industry is consequently most concentrated. The previous transparency showed the location of the world's most polluted ocean areas - - - the coastal regions. The combination of increasing pollution precisely here, and the simultaneous intensification of fishing due to the increasing population results in decreased production of fish in many areas. By using resources sensibly, approximately 100 million tons of fish can be caught annually. To achieve this, international cooperation will be necessary.

The World Bank
Washington, D.C. 20433
U.S.A.

JAMES D. WOLFENSOHN
President

January 26, 2001

WORLD DEVELOPMENT REPORT 2002

Sustainable Development with a Dynamic Economy:
Growth, Poverty, Social Cohesion, and the Environment

Growth in material well-being is a central element in advancing human welfare and reducing poverty. Growth requires investment in productive physical capital. And a development strategy focused narrowly on physical investment and growth can be successful for a period. However, if policies to increase aggregate wealth waste natural resources, inflict unnecessary damage on critical environmental processes, undermine social cohesion, or fail to rapidly reduce poverty, they can generate serious problems. These problems can be ignored for a while, but not indefinitely. Unattended, these social and environmental problems can fester to the point where they gradually or abruptly undermine the scope for improvements in human welfare. Sustaining growth over the long term therefore requires that such problems be addressed integrally in current growth strategies and investment programs. It is better to address these problems well before they become crises, since the lead times can be long.

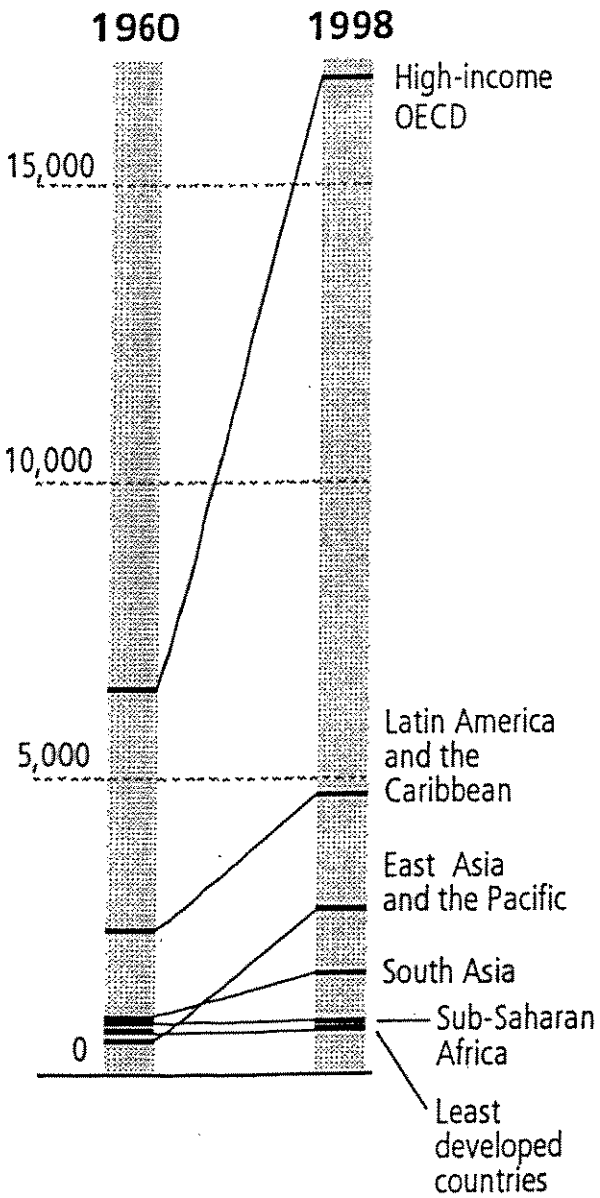
Examples of such problems are: (a) *Socio-economic inequalities.* When communities are relatively isolated, they may be able to sustain very different degrees of total wealth and income inequality for long periods. As globalization removes barriers to the mobility of people, ideas and information, individuals grow more aware of opportunities and living standards elsewhere, and of the nature of many of the obstacles they face. Much milder combinations of inequality and rising expectations than those seen today within and among countries have often fueled social tension and upheaval in the past. (b) *Demographic stresses.* Even though there is evidence that developing countries are undergoing a demographic transition


LOCATION OF KERALA
IN INDIA
N
JAMMU & KASHMIR
CHINA
PAKISTAN
UTTARANCHAL
DELHI
NEPAL
BHUTAN
Patna
JHARKHAND
CHHATTISGARH
Calcutta
Mumbai
(Bombay)
ARABIAN SEA
BAY OF BENGAL
KARNATAKA
KERALA
Thiruvananthapuram
Map not to Scale
Copyright (c) Compare Infobase Pvt. Ltd. 2001-02

FIGURE 1.6

Widening income gap between regions

GDP per capita (1985 PPP US$)



Source: Human Development Report Office calculations based on World Bank 2001g.

Development Aid Consequences in Latin America

Strengthened local elites (polarization)

Displacement of local merchants (TNC)

Domination of local finances (TNC)

Capital drain

Technological dependency without know-how

Lower wages and worsened work conditions (TNC)

Increased seasonality of labor (TNC)

Rapid loss of forest to agribusiness

Dumping of pharmaceuticals and pesticides

Political manipulation (Guatemala, Chile, Nicaragua)

Increased national debt

RK/HW/D180

FIGURE 4.3

Global economic disparities