

Preface

Population: Answering the Needs and Demands

The world's human population is 6.6+ billion people and growing (by 80 million in 2005). Most of the growth is in less developed nations. The Population Reference Bureau (2006) estimates that the global population will reach 7.9 billion people by 2025. It is projected to stabilize at 9.2+ billion people by 2050. Governments strive to attract industrial, manufacturing, services, and other projects to advance their economies and thus cope with existing social and political problems and future challenges heightened by expanding populations. They are encouraged in these efforts by international lending and development organizations such as the World Bank and the International Finance Corporation. These and other multilateral, regional and sub-regional development banks make funds available for economic and social improvement programs in developing countries (Table p.1). Well-planned projects can stimulate economic growth and create wealth in a society. This wealth can be used to promote the health, education, and general welfare status of its members, and their employment opportunities even as populations expand.

There are many theories that define and expound on economic development. Malizia and Feser (1999) summarize the theories in terms of their essential dynamics, strengths and weaknesses, and how they are applied to achieve growth. All theories agree that economic advancement is based on investing capital in projects that can flourish and yield financial gain over extended periods of time. Agriculture, energy, industry/manufacturing, transportation, forestry, fisheries, and other sectors are the foundations for local and national economic progress via domestic consumption and/or exported commodities. Solely or grouped, sector contributions to development of an economy often change over time. Greater diversity in the bases of economies and emerging markets they can reach gives them greater stability and promise of long-term growth. At the same time, well-planned projects allow for socio-political evolution and an improved quality of life for existing and expanding populations in environmentally clean and safe ecosystems under traditional, but oft times slowly moderating, cultural norms.

A limiting factor in economic expansion is the availability of natural resources. In context of growing populations with greater purchasing power and thirst for goods

Table p.1 International groups that can make funds available via loans or grants for the advancement of carefully planned and transparent economic and social development programs in developing nations

Multilateral Development Banks

The World Bank

(International Bank for Reconstruction and Development)

International Finance Corporation

European Bank for Research and Development

Interamerican Development Bank

African Development Bank

Asian Development Bank

Multilateral Financial Institutions

(Focus on Special Sectors or Activities)

European Commission

European Investment Bank

Nordic Development Fund

Nordic Investment Bank

Islamic Development Bank

International Fund for Agricultural Development

OPEC Fund for International Development

Sub-Regional Groups

Caribbean Development Bank

Andean Development Corporation

Central American Bank for Economic Integration

East African Development Bank

West African Development Bank

Aid Granting Organization

U. S. Agency for International Development

and services, renewable natural resources must be utilized at sustainable rates if they are to be available to future generations. Extraction-based commodities (e.g., mineral ores, fossil fuels) are ever decreasing. The implication is non-sustainability for these. Their availability can be extended if consumers cover the higher costs for extraction and production.

Investment in research and development of alternatives to or substitutes for over-exploited and shrinking natural resources, if successful, can preserve product costs or lower them. This then becomes a major planning factor. Another component of successful project design to maintain or increase productivity is to have proactive management responsive to people and resource realities. Management must accept the concept that a limitation to growth may be real in some sectors whereas advances in technologies and product design and evolution can support growth in others.

Earth Chemistry: Preserving the Nature of Ecosystems

Air, water, soil and sediments are surface/near-surface phases with chemistries that define the viability of terrestrial and aqueous environments. To a great degree, the chemistries determine an ecosystem's capacity to nurture and support the biochemical needs of its inhabitants. Intrusion of surface and near-surface gaseous, liquid, and solid earth phases by potentially toxic chemicals and particles from agricultural, manufacturing, industrial, and other activities can degrade them and reduce the optimum vitality levels of ecosystems.

The pathways of pollutants to ecosystems and their inhabitants are at or near the earth's surface in the air, water bodies (fluvial, aquifer, estuarine, marine) and their associated wetlands, soils and rocks (Fig. p.1). Humans ingest pollutants via primary and secondary routes. One is from breathing (toxic gases, acid aerosols, potentially toxic metals). Another is through drinking, cooking with, washing with, and irrigating food crops with contaminated water. A third is through foods grown in polluted soils or food animals that eat tainted cultivated forage, or through food fish. Bioaccumulation of potentially toxic chemical elements or compounds over time can harm human health, physical condition, and mental acuity. This will lessen a population's contributions to economic and social progress. Other ecosystem life forms suffer the same effects.

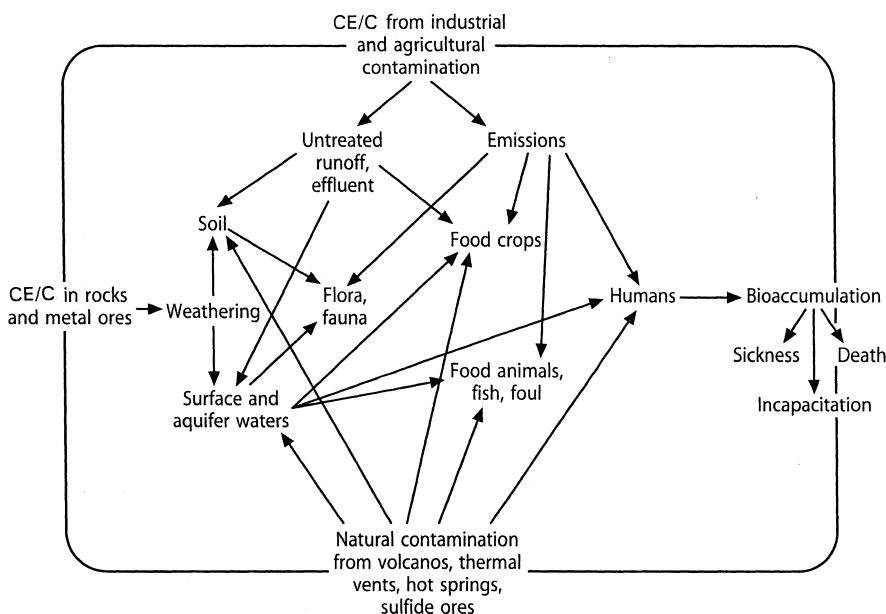


Fig. p.1 Pathways of potentially toxic chemical elements or compounds (CE/C) in the ecosystem that originate from natural and anthropogenic sources (after Siegel, 2001)

Ideally, to be able to provide life-sustaining essentials to expanding populations, especially in developing regions, an effort must be made to preserve land and water sources in their natural and fertile states. Land and water cannot withstand degradation by overuse, over harvesting, or from intrusion by contaminant chemicals, and still remain productive to nurture vital ecosystems. Yet, in developing and many developed nations, environments and the ecosystems they contain are polluted with toxic chemicals and ravished by overuse often by corporations with short-term profits as their goal. This lacks foresight. If environmental abusers continue operations that damage the land, and pollute waters and air to improve their financial gain, they will lose productivity and the expectation of long-term profits. The sustainable use of terrestrial and aqueous ecosystems and the natural resources they nourish depends on proactive planning that protects them from chemical, biological, and physical intrusions that can harm their integrity.

Development: Driving it Forward

Human resources drive the engines of development and economic progress. This advancement is founded on ready access to a healthy, educated labor pool capable of doing assigned jobs effectively and efficiently. With continuing education as a management priority, a top labor force will acquire the knowledge and capability to take on new responsibilities. Thus, human resources must be supported physically, socially, and intellectually to sustain progressing economies. This demands forward-thinking leadership and management decisions to invest a significant portion of business profits along multiple lines. One decision line requires investment to champion healthy environments on the job and at home. A work force that suffers chronic illness or other maladies from dirty air, polluted water, and contaminated soils that yield tainted crops, will lose workdays or not be well enough to carry out tasks to reach targeted productivity levels. With health problems in labor force families, efficiency will decline because of workers' anxieties.

Other decisive steps that sustain economic development include investment in basic and applied research to update and refine production methodology and existing products, and to create new ones. In addition, incorporation of up-to-date pollution control technologies to sectors as they are proven effective is essential to an operation's efficiency, improvement, and profitability. These management steps are practical, humanistic, and focused on preserving and increasing productivity.

Successful national and local economic programs need socio-political stability as one main factor for development planning that benefits workers, management, and investors. This comes in part from reaching goals such as increased employment opportunities that in turn result in higher incomes, and a better quality of life (e.g., in health and education) for labor forces and their families. Thus, an increase in meaningful employment opportunities has to be another focus of development goals, especially in light of growing populations and their needs. When businesses with

positive and increasing cash flows have well-defined profit investment strategies, these objectives can be reached.

The Messages

This book reviews the problems associated with growing populations in terms of earth surface/near-surface chemistry and their basic needs. . .breathable air, useable water, and unadulterated food. The book relates this to economic growth and societal tranquility. It examines the natural and anthropogenic origins of various chemical contaminants in atmospheres, waters, and soils and tracks their likely pathways to ecosystems and to humans and other organisms. Examples in the text illustrate the impacts of chemically contaminated atmospheres, waters, and soils on humans and other living populations.

The concept of environment friendly or “green” laws and cases where they have improved environmental health provide guidance to development planners. The cases alert planners to how they can shape and work out projects that will yield good returns on investments over long periods of time yet preserve ecosystems and their natural resources. In light of this, the book examines methodologies that can be used to short-circuit pollutant pathways to living environments in order to maintain the cleanliness and vitality of ecosystem Earth. Further, it evaluates their effectiveness and short-term/long-term costs/benefits relations with pollution control technologies installed in new development projects or retrofitted into existing polluting facilities.

The text appraises the economic, social, and political benefits of reducing population growth and the passing and enforcement of laws that alleviate or eliminate chemical and other sources of pollution. Environmental awareness during development planning, and investment in best available cleansing technologies, can minimize the input of harmful chemical elements and compounds to stable, vital ecosystems. Such awareness benefits human populations, other life forms, and natural resources on which they depend. Properly focused environmental stewardship is a major factor that carries promise of ecosystem sustainability even as populations expand. Actions to confront pollution problems must become “now” imperatives. Acting now to initiate necessary changes in humans’ attitudes and practices that set the betterment of viable ecosystems as goals can alleviate or even eliminate environmental threats be they local, national, regional, or global. This will sustain the natural balance of our planet for the good of all life for generations to come.

Demands of Expanding Populations and Development
Planning

Clean Air, Safe Water, Fertile Soils

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