

SUSTAINABLE HUMAN DEVELOPMENT IN THE TWENTY-FIRST CENTURY: AN EVOLUTIONARY PERSPECTIVE

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Keywords: Human development index, biological evolution, symbolic cultural evolution, technophysio evolution, cultural diversity, global demographic and health transitions, migration, human capital accumulation, motivation and human development, globalization and the labor market, globalization and the rule of law, poverty and inequality, gender roles and status, environment and human development.

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Summary

Human development is a multidimensional and complex concept, partly a result of the complexity of human nature, the way humans interact with each other as individuals and social groups, and partly a result of how humans view their role in the ecosystem and the way they treat their environment. Over the course of time, humans have been gaining greatly in scientific knowledge, intellect, and material comfort, but not necessarily in the development of just institutions or in rational collective judgment. Human development requires more than scientific or material progress.

World development has been characterized by accelerated scientific and material progress combined with increased poverty, glaring inequity, and violence. These apparently contradictory developments could be clarified in the context of two paradigms. In the first, it is believed that unequal development and its associated ill effects are inevitable consequences of human nature, a “selfish gene.” The second

paradigm asserts that this prospect is not inevitable. Negative externalities of these “natural” evolutionary tendencies could be managed, with larger and more equitable gains to human society. Not all paradigms agree on human development objectives or strategies.

At the close of the twentieth century, four major forces were shaping human development and they will continue to influence its structure and sustainability through the twenty-first century. They are: scientific development, human capital formation, culture, and the globalization processes. Advances in science and technology proceeded in two realms: the physical world and the living world. These scientific advances, although contributing significantly to human development, introduced puzzling questions, and many had negative consequences. The scientific revolution apparently generated a futile race between reduced natural immunity and increased exposure to the risk of disease, and the development of remedial measures to deal with these emerging consequences, an inefficient evolutionary process. Furthermore, recent advances in neuroscience and genetic engineering opened up possibilities of improving mental and physical human capabilities that are transmittable across generations, with social and environmental consequences that have not been fully examined. Technical decisions that influence the distribution of capabilities and opportunities require an ethical filter.

Human development in the present age is based on knowledge, its development and accumulation. In this knowledge environment, the role of *culture*, especially its diversity and adaptive capacity, is essential. However, the present phase of *globalization*, which institutionalizes open borders and unrestricted flows of information and foreign lifestyles without barriers to content, may deliver shocks that threaten the peaceful adaptive capacity of many indigenous cultures. Some societies may reject foreign ideas regardless of their potential social benefit, with great loss to human development.

Globalization is a cumulative process that started from the time civilizations began interacting and communicating. The present phase differs from previous phases. It is fueled by the accelerated pace of innovations that are cementing inter-dependence among states around the world, through the spread of information, finance capital, and regulatory institutions. Historically, periods of massive industrial consolidation and dramatic technological innovations have been followed by periods of political, social, and institutional reforms that come into conflict with democratic ideals. Sustainable human development in the twenty-first century is full of both promise and uncertainties.

1. Introduction to the Issues

Order is not a pressure imposed upon society from without, but an equilibrium, which is set from within.

(J. Ortega y Gasset, 1927, quoted in Hayek, 1955)

This essay examines the state and nature of human development and identifies factors that determine its enhancement for the twenty-first century. A general goal for human development is to enhance the quality of human life. However, the concept “quality of human life” is not well defined. It is determined by a set of interrelated factors that cut

across many disciplines with varied perspectives and paradigms. These include the prevailing culture, health status, economic performance, political and social conditions, the building of human capacity and capabilities, and institutional development. For example, in an environment characterized by enhanced quality of human life, it is expected that people will be able to lead long and productive lives. They are also expected to enjoy good health, have access to knowledge and educational opportunities, and be treated by all with respect, in a socially equitable and dignified manner. In the sphere of political economy, they are expected to have the opportunity to participate in governance decisions that affect their lives and the community in which they live; and to have the potential to earn sufficient income to supply themselves with ample nutrition, shelter, and other material and aesthetic needs. Meanwhile, people are expected to maintain a sustainable environment and equitable social contracts across generations. In the present evolutionary perspective, a prevailing “culture” is characterized as a “weighted sum” of these context-specific factors.

However, these factors are not independent in their effects, nor do they act in harmony. For example, advances in medical science have greatly improved survival and health status in the developing countries. But they have also resulted in high rates of population growth, raising difficult challenges to development in many of these countries. Medical advances lead to extension in life expectancy at old age. However, excesses in such extension result in significant changes in the age structure and in the efficacy of related socio-economic and health institutions. In biotechnology, advances that enhance yield through genetic engineering have established this technology in major crop production around the world without careful examination of its net social benefit. Recent studies indicate serious unintended consequences to biodiversity, as the leading biotech corporations are discovering at present. The positive impacts of scientific advances on health, nutritional status, and life expectancy are qualified as net gains in measures of human development, but their negative externalities do not enter into these calculations.

These examples, among others, illustrate the complexity of measuring human development and achievement in the absence of a well-defined system of ranking. Indices of human development are not necessarily optimal, and their elements and weights are not constant over time; they should be assessed periodically. The social welfare consequences of some components of a human development index (HDI) may be nonlinear, or new knowledge about unintended negative consequences may be discovered. At best, HDIs are quantifiable approximations of a subjective and qualitative concept, the quality of life. For example, the United Nations Development Programme has published annually, since 1990, the Human Development Report (HDR), which includes rich information as well as a human development index (HDI). The HDI is based on three indicators: longevity, as measured by life expectancy at birth; educational attainment, as measured by a combination of adult literacy and the combined gross primary, secondary, and tertiary enrollment; and standard of living, as measured by real gross domestic product (GDP) per capita. Although a crude measure, it does serve the important function of focusing policy and academic attention on the wider aspects of human welfare not included in the standard GDP per capita. But the HDI should not substitute for careful analysis of the rich information provided in the HDR, and both undergo periodical assessment since the nature of human development

is not static. It is continuously evolving.

Human development does not proceed independently of its environment. As humans alter their environment, the altered environment alters human destiny as well. It is for science to indicate the consequences and provide remedial and preventive measures. It is for a democratic system of social choice that includes a philosophy of human development to define its scope, assess progress, balancing competing concerns, and make allocative decisions.

2. Toward a Philosophy for Human Development for the Twenty-First Century

An attempt to examine the conditions and framework for a human development strategy requires a guiding philosophy that harmonizes and rationalizes the three universes of human culture: faith, science, and the arts. It should explore the synergistic nature of these basic elements of human culture, provide a ranking system of achievements in the various spheres of human actions, and provide a “balance” between an idealistic vision of human nature and social organization (Plato/Hegel), and one based on an empirical understanding of the dynamic interactions of humans with their external environment (Locke/Hume). The goal of such a philosophy is to provide balance and harmony in human affairs, leading to enhancement of the quality of life as well as to effective institutions and a sustainable environment.

Human intellect has advanced greatly, since the era of the great Greek philosophers, toward a consistent philosophy of human development. But there are many unsettled issues that persist, even as we enter the twenty-first century. To put the present state of human development into perspective, let us consider a brief historical review of how cultural evolution, with unprecedented versatility and adaptive capacity, substituted for evolutionary anatomical changes, and in turn is being replaced by a technophysio evolution.

2.1. From Biological Evolution to Cultural Adaptation

For hundreds of millions of years, living organisms and animals have been adapting to new environments or to new strategies for exploiting existing environments by the slow process of hereditary modifications of their body structure. Some animal species, within their genetic endowments, extend their inherited physical powers by using elementary tools or by co-operating in hunting or in defense activities. Humans, in the initial stages of cultural adaptation, used similar mechanisms to extend the power of their bodies to cope with an unaltered environment. But that early rudimentary human adaptive capacity, which was linked in the early stages of its development to evolutionary self-selection, evolved independently from evolutionary anatomical change, into a complex and powerful social mechanism that is termed cultural adaptation or cultural evolution. “Cultural evolution” is a distinct human trait. It requires the use of intelligence and social organization. It allows humans to adapt more efficiently to their environments. It also empowers them to change these environments to make them more congenial to human needs and desires, thus achieving unprecedented control over their own destiny

and the destinies of all other living species, as well as the physical environment itself. Once this cultural versatility had appeared, evolution through adaptive radiation with respect to anatomical structures and physiological functions became a far less efficient strategy for dealing with environmental challenges than cultural amplification through inventions and technological progress.

Three basic qualities, acquired by humans as they interacted with their environment, were necessary to evolve in the direction of cultural adaptation. These are artisanship (the evolution of tool making into complex manufacturing and construction activities), conscious time binding (the ability to plan ahead and develop social institutions while benefiting from present and past experiences), and imaginal thinking (the ability to go beyond reality, essential for planned achievement). These three qualities are the foundations of the three principal realms of the present human knowledge. Natural science and engineering are the outgrowth of artisanship. Social sciences are fundamentally ways of directing social behavior to avoid disaster and to improve the material state of humankind. The humanities are extensions of imaginal thinking. Societies that used these capacities more efficiently could acquire more food and defend themselves better against predators, and thus improve their chances for survival and reproduction.

There are two fundamental differences between cultural evolution or selection and biological natural selection that make the former far more flexible. The first is the speed with which cultural evolution can adjust to the environment. Biological natural selection proceeds more slowly and gradually. An alteration of a species that is viewed as sudden may actually take millions of years. Within less than 15,000 years, since humans started to acquire the attributes of “symbolic cultural evolution,” the second phase of the cultural evolution discussed below, they were able to evolve into masters of their environment with a speed that has been greatly accelerating over time. It would probably have taken hundreds of millions of years to achieve these same results through the process of biological natural selection.

The second difference is the importance of education in the transmission of knowledge as opposed to gene transmission in the preservation of the evolutionary process. Education of human offspring and the preservation of the stock of knowledge, independently of genetic transmission through the biology of birth and death, are the key ingredients in the preservation and continuity of cultural evolution. Now it seems feasible, through the mechanism of cultural adaptation, to achieve dramatic changes in human development within one generation; an awesome responsibility for every human generation.

The ability of cultural evolution to develop, by nongenetic transmission, complex patterns of behavior and social organization and institutions was made possible as a result of the human invention of symbolic language. The perfection of symbolism has lifted learning and scientific development to entirely new levels of complexity and continuity. That perfection led human evolution to take the decisive step away from the use of signs as the *modus operandi* for communication, which in turn led to the development of mathematical and logical structures essential for the development of science and human intellect on the global level. The experiences of Helen Keller and

Laura Bridgman, at the beginning of the twentieth century, illustrate that symbolism has made possible advances in human development and culture independent of the quality of sensory function. With feeble human bodies and a lack of essential sensory functions, being blind and deaf-mute, they were able to reach a high degree of mental development and intellect, once they had captured the symbolic use of words. Armed with symbolic skills, *Homo sapiens* became a formidable competitive species, as the demise of *Homo neanderthalensis* illustrates, but not necessarily a rational one. The evolutionary process is not necessarily linear. The *Homo sapiens* species, far from being the pinnacle of the hominid evolutionary tree, could be one more of its many terminal twigs. However, as the discussion indicates, *Homo sapiens* is developing a robust evolutionary niche that could sustain its presence.

2.2. Cultural Evolution, Symbolism, and Globalization

Without the invention of symbolism and its perfection, artisanship, conscious time binding, and imaginal thinking could not have evolved beyond rudimentary levels. The effect of cultural evolution and symbolism on human development has been enormous. By its very nature, symbolism includes the embryo of globalization. Symbolic thought is not attached to sensory data. Humans can relate through thoughtful debate based on logical structures: a more universal communication media, without the limitations of sign language and sense-based data. It took more than 3 billion years for many-celled animals to evolve on Earth, another 500 million years for apes to evolve, and an equal time for *Homo sapiens* to evolve: about 300,000 years ago. During that long span of living history, evolution, including the early development of nonsymbolic cultural evolution, was basically opportunistic and epigenetic. It was not able to produce a pattern of recognized civilizations.

Symbolic cultural evolution, on the other hand, seems to have evolved as recently as 15,000 years ago. Within that short span, great civilizations and cultures flourished, starting with Sumeria, followed by Assyria, Babylon, Egypt, China, Greece, and Rome, up to the present “Western” civilization with its unprecedented progress in science and technology. Some 5,000 years ago in the Middle East, writing was invented and the first cities were established. Within 700 years of these momentous events, the Egyptian Pharaohs had built their famous pyramids and had established the earliest menageries and botanical gardens for pleasure, prestige, and to satisfy scientific curiosity. The evolution of these civilizations did not proceed in isolation. Although path dependent, the development of these civilizations was greatly influenced by mutual interactions through trade, migration, explorations, and conquest. Pre-Socratic philosophy, for example, which laid the foundation for Western civilization, evolved through interaction with and learning from previously established civilizations. It is well established that Western philosophy started in the sixth century B.C. at Miletus on the Ionian seaboard of Asia Minor. Ionia was the meeting place of East and West; it was also the land of Homer. The first Milesian philosophers, Thales, Anaximander, and Anaximenes, were open not only to oriental influences (Confucianism, 500 B.C.) and Homeric tradition (700 B.C.) but to the mathematics of Egypt and Babylon and to the ideas and information that flowed along the trade routes passing through Ionia from the far East. Thales of Miletus (624–546 B.C.), considered the founder of pre-Socratic philosophy, traveled to Egypt to learn astronomy, geometry, and practical skills to do with the measuring and management of land and water. It is remarkable that the five-pointed

ancient Egyptian star, named “sba” by Egyptologists, is the same as that used in the American flag. It also has similar spiritual connotations in early Greek and later Masonic mythology. The history of civilizations indicates a continuity of learning processes among societies. Symbolism had a major influence in facilitating connectivity among civilizations, and in reconciling the anthropologists’ diffusion hypothesis of the unity of civilizations with the empirical question of how isolated societies develop similar tools and modes of behavior.

The historical development of symbolic cultural evolution was not smooth. There was both internal and external conflict. Internal conflict arose from a lack of harmony among the basic components of symbolic cultural evolution: natural sciences and technology (artisanship), social sciences (conscience time binding), and the humanities (imaginal thinking). Initially, harmony was sought through faith. Major religions—Judaism, Christianity, Islam, Buddhism, Hinduism, Taoism, and Confucianism—appeared during that period of symbolic cultural evolution to rationalize the role and place of humans in society and in the cosmic order, and to provide cultural stability through harmony among the main elements of symbolic cultural evolution. For example, in recent history, a self-regulating, invisible-hand paradigm was developed by Adam Smith, following Newton’s view of a harmonious cosmic order. It contended that micro behavior, when left to its own will, is guided by an inherent self-interest motive that converges atomistic behavior into optimal macro order. While providing the foundation for scientific economic analysis, the paradigm built a bridge between scientific development, market behavior, and established faith. However, advances in science and empirical knowledge, combined with “collective self-interest” that reduces individual mobility and motivation, have created tension in that synergy throughout the history of symbolic cultural evolution.

External conflict, partly a result of internal conflict, arose as a defense mechanism to safeguard as well as to diffuse what each culture viewed as superior elements of its way of life: its brand of socio-political organization and development path. Cultural diversity, instead of being viewed as offering human enrichment and progress, was viewed as a threat to the status quo and a call for socio-political alarm; a clash among civilizations seemed inevitable in this paradigm. However, the emergence and apparent inevitability of conflict seems to have been fueled more by changes in the internal dynamics of symbolic cultural evolution. Advances in science and technology led to the Industrial Revolution and the emergence of the present form of capitalism, in which material progress is the primary goal, progress that ultimately depends on the accumulation of resources. Global expansion became a necessity while opportunities were converging towards a zero-sum game status. Thus, although the past three centuries of symbolic cultural evolution have witnessed great advances in science, the arts, and material comfort, they have also witnessed great tension, wasteful wars, unemployed resources, and confused social priorities within and among nations and states.

As civilizations emerged, intellectual and religious leaders increased their efforts to inject human purposes and reason into the course of history, with varying degrees of success. There are optimists who believe that human societies are increasing their ability to chart and follow a purposeful course of change towards a better life for all. However, it seems that optimists are balanced by an equal number of pessimists.

According to some authorities, “the inexorable laws of nature and evolution will eventually override purpose and cause the human species to decline and disappear, as other animal species have done in the past.” In this pessimistic view, the future may not be secure, since as we begin to approach the limit of the earth’s capacity we severely restrict our room to maneuver in response to change. It is true that many species, more than 90 percent, have disappeared over the course of life history. However, as a “generalist” species, not dependent on narrow specific niches, *Homo sapiens* should be a robust one. The history of symbolic cultural evolution, its *modus operandi* and its continuous search for harmony among its three fundamental elements indicate that it is a powerful, robust, and adaptive engine that should be able to guide humanity into a better future. To examine this survival potential, we attempt first to understand the topography and course of that evolution. Every century seems to bequeath crises to the one that follows. What did the twentieth century inherit from the nineteenth century that affects human development and the quality of life? How did the twentieth century cope with its legacy, and what dilemma is it forwarding to the twenty-first?

2.2.1. The Inherited Burden of the Twentieth Century

The nineteenth century bequeathed to the twentieth an age of doubt and disharmony in established cultures. Without harmony among the three universes of the symbolic cultural evolution, the foundations of human philosophies and, by extension, those of culture and human development were shaken and their conclusions questioned. For example, in isolation, theological learning was seen as “lifeless embalment of knowledge.” Scientific knowledge, deprived of conscious time binding (social sciences) and imaginal thinking (faith, philosophy, or the arts), seemed incapable of providing a value system to steer individuals safely through the complexities of life and the negative externalities of technological change. Overall, old ideas were being challenged. New ideas were being born. Meanwhile, the growth of industry, technological invention, and the expansion of colonial power were altering the face of nations economically, socially, politically, and environmentally.

The nineteenth century was a period of contradictions: an age of hope and doubt, of culture and anarchy, of freedom and slavery, of democracy and exploitation, of nationalism and colonialism, and of the birth of seminal revolutions in thought on the one hand and the death of established ideas on the other. It was the century that spawned the likes of Bentham, Darwin, Hegel, Mill, Marx, Nietzsche, Einstein, and Russell, building on the works of Galileo, Descartes, Ibn Khaldun, Hume, Newton, Rousseau, Helvetius, Kant, Malthus, and Adam Smith, among others. On the one hand, it was a century of significant scientific discoveries, such as John Dalton’s proof (1808) that matter consists of atoms, or James P. Joule’s finding (1851) that energy is indeed conserved, or Charles Darwin’s *Origin of Species* (1859). There were also significant inventions such as the telegraph, the automobile, the telephone, and electrification, among others. On the one hand, it was a marvelous century. On the other hand, it was one of chronic malnutrition, illiteracy, and poverty for the majority of humankind.

At the end of the nineteenth century, there were serious doubts about the viability and moral justification of the national and international socio-political order, as well as concerns about the economic and social conditions of the working class. Two crises in

particular had been responsible for the skepticism about the nature of cultural evolution and the future of humanity: a crisis of “science and faith” and of “empiricism and rationalism.” There had been earlier signs, even before the dissemination of Nietzsche’s controversial philosophy, of a widespread decline in the belief in a divine creator whose authority could decide baffling questions of faith and morals (although Nietzsche wrote, apparently despairingly, that people would rather have the void as purpose, than the void of purpose). Natural sciences, geology, biology, and physics had a hand in this crisis. Rational scrutiny and empirical documentation discredited many claims regarding the age of the universe or the origin of humanity that had been accepted as matters of faith.

Empiricism is the view that knowledge of the world is based upon and derived from sensory experience. It claims that whatever is in the mind must be first in the senses. Empiricism is clearly the opposite of rationalism. The latter maintains that reason alone can provide knowledge of the existence and nature of things; reality is a unified, coherent, and explicable system. By the end of the nineteenth century, empiricism, as a philosophy, slowly supplanted rationalism to become the prevailing point of view. The *modus operandi* of empiricism has been characterized by its reliance on sensory data as the only source of knowledge, its refusal to accept anything but material reality, its subjective and relative stance on moral and psychological matters, and its skeptical perspective on the most essential issues underlying human existence. The result is that while “empiricism” loosened many dogmas and made room for diverse attitudes, it deprived many of a secure basis on which their culture, belief, and action rested.

Not all students of human culture adhere to the empiricist view. Some continue to hold that ideas are the foundation and the essence of all things. In their view, knowledge is based on the ideas we ourselves hold, as well as those held all around us. It is through these ideas that we discover our identities, the societies we create, the political and cultural institutions we construct, even the direction in which we take history itself. Just as faith, economics, or the subconscious functions are the means through which other phenomena must be explained in the systems of Aquinas, Marx, or Freud respectively, it is “ideas” that perform that function for “idealism.”

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For more details about the various topics discussed in the present essay, readers are referred to the articles presented in the Sustainable Human Development theme. The following are selected references for

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Biographical Sketch

Ismail Sirageldin is Professor Emeritus at the Johns Hopkins University. He has been professor of population dynamics, economics, and international health. He is also a fellow and member of the Board of Trustees of the Economic Research Forum for the Arab Countries, Iran, and Turkey (ERF). Professor Sirageldin's major research and professional interests are in the interrelations between population dynamics and human resource development, environmental consequences of population change, and food policy analysis. He has consulted to various national and international organizations and governments, and served as a chairman and member of various employment, health, education, and human resource missions in the Arab region and around the world. Professor Sirageldin served as Chief Advisor for the Pakistan Research and Evaluation Center; Senior Scholar, UN Cairo Demographic Centre; Senior Advisor, Kuwait Institute for Scientific Research; member of the WHO International Advisory Committee on Health Statistics; the World Fertility Survey; and member of the UN/IUSSP Committee on the Evaluation of the Fertility Impact of Family Planning Programmes. Professor Sirageldin has written numerous articles, chapters, books, and book reviews on economic development and population dynamics. In 1978, he founded *Research on Human Capital and Development* and acted as its series editor.