Chapter 1
The Challenge of Implementing Macroeconomic Policy in an Increasingly Microeconomic World

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Abstract "How did I get here?" (Byrne and Eno. Once in a lifetime—Talking Heads song (Album). Sire Records, Philadelphia, PA; 1980).

The problem with development and implementation of large-scale policy into small communities is foundational to the basic conflict in an economics-driven society. That is, economic growth normally depletes resources and reduces ecosystem services leading to negative environmental externalities that, in turn, impacts social welfare. But national policy still places economic growth as a leading indicator of societal success, even if success is achieved to the detriment of the global scarcity of resources, contributing to child mortality, obesity, lack of access to clean water, unsafe communities, uncertain citizenship status, and similar concerns. All these negative environmental conditions crucially influence health conditions, whatever undeveloped, emerging, or industrialized country is considered. Reconciling the differences in this multidimensional political, social, economic, behavioral, life science, and public health dilemma is tricky, at best, due to governing models reliant on a foundation of economics, history, and mathematics—a triple bane of every scholar's existence. However, the opportunity to generate progressive and sustainable change absent this foundation would otherwise be missed. Thus, this chapter introduces and then unfolds the economic problem in contrast to human development that is at the root of the challenge of implementing national economic policy and the local impact effecting general human development and quality of life. The chapter addresses the application of new metrics supporting economic, human and sustainable development and closes with the application of these metrics towards reasonable constraints of national equitable distribution and global economic expansion.

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1.1 Introduction

Societal problems associated with poverty persist just as the basis of the economic problem has not changed since economist Adam Smith introduced the concept of the distributive and commercial nature of land, labor, and capital into the colonial United States. Though Smith's understanding of opportunity through increasing trade flows came in the form of "agriculture, manufacture, and trade" (Campbell and Skinner 1982, p.172), the key to success remains in output or production capacity. This holds true even as agriculture became secondary to industrialization on the basis that any service or commodity, natural or man-made, can be purchased for a price or exchanged. But Smith was also aware of the need for equal distribution of assets to obtain successful human development for the population who had not inherited wealth (Kim 2009; Sen 2010). Others, such as John Rawls, later developed the imperfect but progressive theoretical premise to infuse justice within the framework of institutions and not exclusively to law administration (Garrett 2005; Rawls 1999) attempting to offset the persistent conditions of wealth distribution inequality.

A specific definition of human development can be found in the Human Development Report by the United Nations Development Programme (UNDP) as "a process of enlarging people's choices, the most critical ones are to lead a long and healthy life, to be educated and to enjoy a decent standard of living" (United Nations Development Programme 2010, p.10). Such approach originates from the contributions by Amartya Sen (1970, 1984) and represents a milestone in the debate on how to go beyond the Gross Domestic Product (GDP) measure by incorporating various concepts raised in earlier development discussions and places them in a comprehensive framework (Costantini and Monni 2008). As a general remark, by combining the capability approach developed by Sen and its operationalization into a synthetic Human Development Index as proposed by the UNDP, the concepts of welfare and utility adopted by the neoclassic utilitarian framework to assess the development level of a nation are completely revised, and the classic utility gains based on achievement of higher income levels are substituted with the satisfaction of a crucial condition that is an even distribution of means and ends. Thus, a higher GDP level is only considered a method to reach a better quality of life in terms of improved functioning and capabilities.

The need to modify Smith's economic approach became apparent in several ways. The notion that land, especially during unconstrained U.S. Western Expansion, was a limitless element that could continue to be exploited to overcome poverty and the overarching objective to achieve social equality halted in the face of dismal reality. Eventually, the cost of achieving social equality became evident in the 1970s as the cumulative impact of environmental decay was the recognizable result of unsustainable economic growth and lessening quality of life evidenced by each successive generation. The U.S. National Environmental Policy Act of 1969 began an aggressive attempt to reduce the negative impact by establishing the foundations of environmental quality in national policy. But with diminishing access to natural

resources also came fewer opportunities as large tracts of land had already been swallowed up by developers, resources stripped, and once thriving communities abandoned for greener pastures, both literally and figuratively.

Consequently, reduced and harder to exploit resources increased the cost of extraction and decreased the capacity to move up from depressed environments resulting in a greater economic span between the "haves" and the "have nots." The distribution of that wealth computed from 2012 complete comparative data indicates that "the top 1 percent owns 42 percent of total U.S. wealth, up from 25 percent in the 1970s" (Zucman 2016, p.39) while "the bottom 90 percent collectively owns just 23 percent of total U.S. wealth, about as much as in 1940" (Zucman 2016, p. 42). For most the standard of living is not improving and this weakening in social status, or low socioeconomic status (SES), is linked to limited economic opportunity, social and behavioral conditions spanning diverse regions across the globe (Checkley et al. 2016; Katikireddi 2016; Lilford et al. 2016; Venkataramani et al. 2016) that is concurrent with a decline in public health.

To compensate for declining resources, some theorists have discussed the addition of a fourth factor of production including entrepreneurship (Holcombe 1998), technology (Dewan and Min 1997), and/or a combination of entrepreneurial technology. Still others consider these additions simply to be the mechanism through which labor is employed in the production activities. Certainly, technology has provided a way in which previously inaccessible resources might be reached to extend the "shelf-life" of mineral-rich locations and to provide a mechanism for growth in countries with limited resources. However, this chapter will stick to the foundational elements of production for simplicity.

Thus, the chapter introduces basic economics and production inputs, reviews the historical conflict in the measure of societal success through gross national product (including humanitarian foreign investment) and the impact on public health, discusses some behavioral and environmental factors in public health policy development, and proposes how future international development collaborations can restrain global expansion and the impact of industrialization. Finally, the chapter concludes with recommendations and a high-level summary.

1.2 Basic Economics and Production Inputs

The basic economic components continue to revolve around the capacity to optimize the inputs of land, labor, and capital with the goal of production. This general premise remains consistent despite notable variations caused by factors of post-industrial societies including dynamic political systems (e.g., monarchy, democracy, oligarchy, dictatorships), cultural mores (e.g., religious, provincial, male-dominated, slavery), and environmental landscapes (e.g., soil-rich plains for agriculture, seaside for fishing/tourism, oil-rich) that can adjust independent factors (Annenberg Foundation, Bridging World History 2016). Notable is that the influence of pre-industrial cultural factors, such as slavery and religion, continue to

influence national production decisions with policy shifts emphasizing strong beliefs of fairness and lifting oppression. The fact remains, however, that the introduction of policy has also been a source of oppression. Therefore, this section will provide a general description of basic economics and define the three production inputs and in so doing, introduce the problem relating to this dynamic role of oppressor and savior.

We note that prominent factors relating to the economy are continuously monitored but sometimes become lost in the grand scheme of currency reflected in gross national product. They include the seemingly mundane announcement of unemployment statistics often viewed as "someone else's problem" if you are gainfully employed but is a factor that greatly impacts the mental and physical health of individuals, communities, and nations around the world. The global implication of conditions that impact public health spans social and behavioral factors such as criminal, terrorist and geopolitical activities often leading to war. The product of conflict compounds with displaced employees through immigration, cultural clashes, and lack of opportunity. Traditional environmental contaminants—a consequence of industrial development—such as poor air and water quality also contribute to the onset of chronic diseases, reduce the quality of life, and limit opportunity, especially for those unskilled workers.

Thus, the problem boils down to balancing the opportunity for human development and quality of life against the erosion of natural resources because at some point, the cost of short-term economic advantages against long-term environmental decay is unsustainable. Understanding these key elements is important to developing, recognizing, and implementing sustainable solutions that can balance the same overall need to improve the variety of environmental conditions against more effective, efficient, and equitable methods of both achieving and measuring development.

Figure 1.1 illustrates the interaction of the elements of production (e.g., land, labor, and capital), the high-level elements of the economy in the form of the costs of decision-making driving production and exchange of goods and services, and the economic problem: "When faced with unlimited wants, how do you address the problem of limited resources?" Both sides of the economic problem must be balanced against needs and resource depletion such that distribution on the left side of the economic problem takes into consideration the impact on the right side relevant to the distribution of goods. Who benefits from employment by producing goods? Who receives goods? What natural resources are depleted in the process? What part of the population is impacted by environmental destruction leading to poor health? Some items are produced for basic consumption, such as food, while others are made to address a desire (e.g., limited edition vehicles). Both have the potential to generate advantages, such as power for a government providing food for a portion of constituents, or wealth for the entrepreneur or innovator who can provide luxuries for the elite or at least those with disposable income and/or good credit standing.

The seemingly simple decision to build a facility to extract natural gas in Florida seems relatively clear because the facility would generate jobs acting as a mechanism to stimulate the economy. The Florida Everglades location, rich in natural gas that

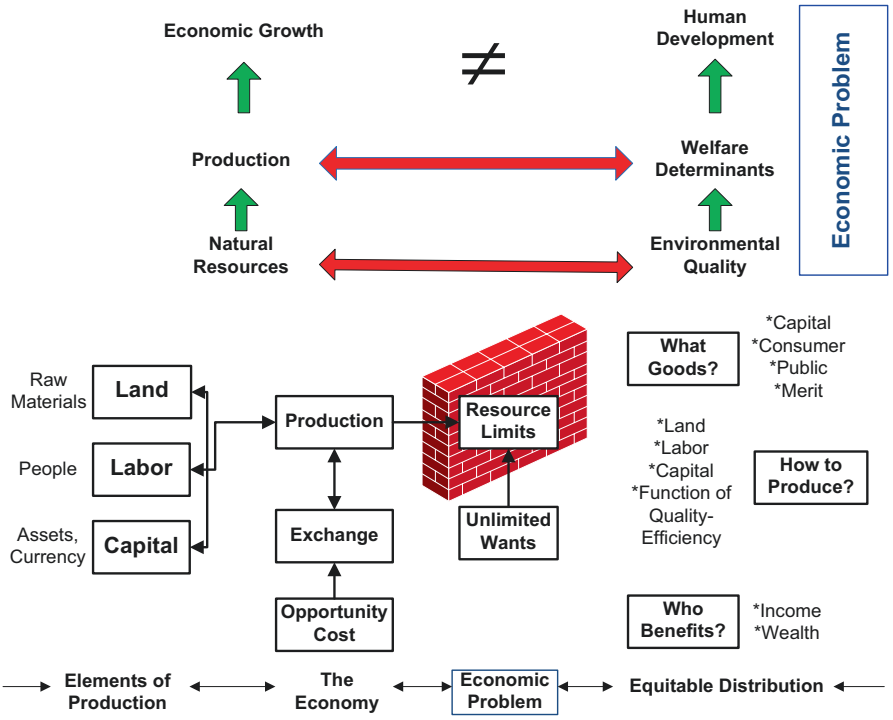

Fig. 1.1 Both sides of the economic problem represent a basic concern—the determination of asset distribution to produce items addressing consumer wants while weighing the cost of asset depletion, limited opportunity, and equitable distribution of products (Fiedler 2009)

can be extracted from limestone, presents a common problem in land use decisions—balancing environmental and population health, especially when the land in question is a vital watershed and a national park (Quest 2015; Russo and Screaton 2016). Simultaneously, a decision to move forward with extraction provides a basis for concern for the perceived, if not actual, long-term effect on land. Short-term gains could successfully elevate the local population income and contribute to national economic growth, but at the expense of destroyed watersheds leading to poor water, increases in vehicle emissions leading to poor air quality, depletion of natural resources and landscapes to accommodate raw materials and infrastructure, and manufacturing waste escaping into the environment as a direct result of production. The local application of national or state economic policy is a complex basis from which to achieve a balance of human development, economic opportunity, and sustainable living conditions resting on the careful manipulation of land, labor, and capital that drive nations.

Land is an asset and a primary factor of production. The term is generally described by The Business Dictionary as a factor of production with limited supply and no cost of production that applies to "all physical elements in the wealth of a nation bestowed by nature (including but not limited to) climate, environment …

(and) minerals." Nations define land in relation to what is on, above, and under the ground "down to the center of the Earth" (http://www.businessdictionary.com). Consequently, even if you could dig your way to China there would be no financial incentive.

Labor is both the physical and literal backbone of society because of the relationship with production that Smith initially refers to as the application of skill, dexterity, and judgment (Campbell and Skinner 1976; Kim 2009; Smith 1776). The concurrent transition from the limitations of the physical aspects of labor to the intellectual and innovative capacity of the work force became evident through improvements in rate of production from technology. This led to the concept of labor as a key to the development of large-scale supply and demand. Supply and demand also brought forth a division of labor often increasing competition for jobs and ultimately, economic opportunity.

Many are politically opposed to the last element of production—capital, because they must acknowledge that the source of economic opportunity must come from some form of existing wealth. The use of capital as a crucial production factor in the mainstream economic literature supposes that wealth is privately held and consequently exchanged on the market as a good fully characterized by perfect competition. In turn, this also implies that perfectly assigned private property rights are in force, and that no externality occurs. All other forms of capital (or more generally endowments, including natural resources) and management (e.g., collective actions) are considered as inefficient. On the contrary, the Nobel laureate Elinor Ostrom would argue that a properly defined property rights regime is strictly connected with the type of resource under consideration, but more importantly with the quality of the formal and informal institutions that are supposed to manage these resources. Especially in poor communities, Ostrom defined some necessary conditions under which common pool resource management is more efficient than private property rights regime (Ostrom 1990). However, others will agree that recognizing capital as some form of existing wealth (i.e., land, cash, buildings) is fundamental to production. The primary difference between the former and the latter is that the latter holds that there must be some form of existing capital.

Capital is the "wealth in the form of money or other assets owned by a person or organization or available for a particular purpose such as starting a company or investing" (Oxford Dictionary at https://www.oxforddictionaries.com/). Innovators, intellectuals, creative artists, and all those not born into wealth may, at some point, rely on investment in some form or another whether funding is direct through novel product development or indirect because you work for someone building their product or service. Access to capital is fundamental to production. Historical references attest to this fact from Italian explorer Christopher Columbus who was funded by Spanish royalty to discover new trade routes, to modern Angel Investors (https://www.entrepreneur.com/article/52742), and Sharks (http://abc.go.com/shows/shark-tank/).

The concept of capital investment is not new, but we recognize that some of the mechanisms to accomplish access are somewhat different from when Columbus approached the throne—an event not to dissimilar to approaching a panel of wealthy

entrepreneurs on the American Broadcasting Company television production Shark Tank. Social media is a game changer in the acquisition of funding but while the venue has changed, the players have not. One side has wealth, one side needs the capital to create their product and thus, their own wealth. Whether that exchange occurs is dependent on the ability of the taker to convince the giver to take the risk of investment based on the projected value of the future product.

This section introduced the economic problem of equitable distribution of the input factors of production using endowed national resources of land, labor, and capital. We move to an overview of low SES in relation to public health from this foundation.

1.3 Striving for Innovation: Public Health and Socioeconomic Status

> "For health and health care in the US … 6 years after the passage of the Affordable Care Act (ACA), nearly 30 million Americans remain uninsured. Americans spend more on health care per person, yet overall life expectancy sits at the bottom of a list of comparable nations. Long the frontrunner in medical innovation, stagnant funding of biomedical research has begun to erode America's edge." (The Lancet 2016, p.388)

The onset of the Trump administration in the USA in 2017 has been viewed negatively by many outside her borders. But for many Americans, restoring foundational governing concepts of life, liberty, and the pursuit of happiness must emphasize a balance between support for local research and development that can simultaneously offer financial and health incentives to the US economy, not just for nations who are benefactors of US foreign investment. More importantly, the growing problem of poverty leading to poor public health (Katikireddi 2016) must be addressed. Therefore, policy development should reflect a variety of stakeholders in relation to health, human, and economic development by designing mechanisms for logical investment in research and novel business opportunities. The basis of this statement is that research leads to innovation that, in turn, increases income opportunity, and thus, economic growth. Income opportunity can help pay for basic needs such as housing, food, and healthcare but must be balanced with sustainable methods that may require a fresh perspective on "money" and out of the box thinking when balancing population needs against alternatives that promote better prospects for those left out of the system.

1.3.1 Money an Unnecessary Evil?

Money makes the world go around. Or does it? The introduction of BitCoin and other virtual currencies has encouraged growth and the exchange of products in unexpected ways. For example, while BitCoin is an acceptable substitute for

national currency, there are additional benefits to alternative payment methods. One of these payment options—Blockchain—also offers a platform to resolve the problematic nature of tracking the authenticity of high-ticket products and land ownership (*Napoletano* 2016*)*. Blockchain technology can maintain the provenance of the item, such as diamonds and real estate titles, through shared registration and distribution to relevant parties including owners, insurers, estate attorneys, and law enforcement agencies.

The value of these virtual transactions has been felt on a small scale, primarily between individuals and among organizations. But the recent introduction of a cashless society by India has pushed the implementation scale to the national level with no apparent limits in sight.

Just as India has avoided the US problem of creating digital communication infrastructure over outdated analog infrastructure, they too are investing in ways to skip over two generations of financial technology and thus, laying the foundation for a cashless society (Wadha 2017). This pathway starts with linking digital identification of the population to newly created payment banks that hold but do not lend money. The Aadhaar project, an Indian government sponsored program since 2009, has generated a unique identification number for more than one billion people by linking the number to individual retina and fingerprint scans. The creation of the 12-digit number addresses the problem of unrecorded births that had previously kept these unregistered citizens out of the economy and system of social services. More than that, the Aadhaar number provides a way for banking institutions to transfer money under the Unified Payment Interface (UPI) (Razorpay 2017).

Skeptics may, of course, find these items interesting but limited to small transactions and certainly not applicable to "big" economies. But the inclusion of the forgotten population in India accumulated $10 billion from just over 250,000 accounts that were started in the first 3 years the payment banks were in operation (Wadha 2017).

Both novel ways to exchange goods and services and payment options that incorporate those who have been left out of the economic system can serve to remove some of the evil connotation associated with money. This is especially true since they ultimately offer a platform to improve the quality of life in small ways with large benefits such as the ability to (1) pay for utilities including communication and electricity, (2) build safer environments, and (3) generate an inclusive economy.

1.3.2 Thinking Beyond Boundaries

Innovation, of course, is not limited to research or business development related to healthcare though a growing number of healthcare businesses (Statistics Brain Research Institute 2016) account for employment opportunities. Problem recognition and solution generation in Green Business Development (Green Jobs and Career Network 2017) presents an opportunity with very few constraints on production inputs. The emerging field offers a variety of occupations representing diverse

businesses bringing forth the high hope of increasing opportunity in a sustainable fashion. Waste management, natural foods, and cultured meat are areas that show high and continuous growth potential because they solve a problem or need (e.g., increasing population, increasing waste, diminishing food supply, access to fresh food for health), and produce product or services in a manner that sustains the environment.

New York architects from Present Architecture—Andre Guimond, Evan Erlebacher, and Christian Scharzwimmer—unveiled a "Composting Infrastructure Masterplan" in 2013 introducing the concept of a large-scale organic alternative to help eliminate 14 million tons of trash and reduce emissions caused by transporting waste to landfills across state lines while increasing public green space (Present Architecture 2013). Dubbed "The Green Loop," the project brilliantly optimizes existing transportation infrastructure, takes into account the real problem of waste management in a densely populated urban location, and adds 125 acres of public, multi-purpose facilities divided among ten boroughs in the New York metropolitan area (http://presentarchitecture.com/project/green-loop/).

The Green Loop serves to demonstrate alternative ways in which to optimize land use. Another path is the slow but steady emergence of companies who support urban farming that (1) adds thriving green land back into the environment to improve environmental conditions and fresh food resources and (2) provides services and equipment to meet the problem of ways to increase food production for an increasing global population.

For example, Pure Agrobusiness, Inc. (http://www.pureagro.net/) has been asking families, communities, and businesses who are up to the challenge to "Rethink Farming" for the past 20 years. The company kick-starts projects by selling a wide variety of indoor hydroponic technologies and equipment. The west coast company led by Rick Byrd, Chairman and CEO, consolidated with Way to Grow in early 2016 to form the largest US supplier of urban agriculture and hydroponics technologies (Business Wire 2016). Though the business seemingly popped up overnight, Mr. Byrd has steadily built the indoor agriculture enterprise and is positioned to supply equipment for the growing need for urban farming, including medical marijuana. The emerging and controversial market for medical marijuana (ProCon.org 2016) to relieve the effects of chemotherapy in cancer patients (e.g., lack of appetite, nausea, vomiting) and support overall health (e.g., high Omega-3 value in hemp seeds) is another arena in which businesses are making the most of new and growing opportunities for market entry.

Emerging technologies able to produce food from chemical processes rather than through traditional agriculture might help encompassing the global problem of food shortage in a scenario where a rapid population growth is followed by a rapid transition of arable land into urbanized area and a drastic reduction in land productivity. An example might be cultured meat where animal tissue is grown in a controlled environment using cell culture technology rather than obtained by traditional livestock. Industrial livestock production presents the most difficult challenge for the global food system due to production requirements that account for large consumption of natural resources (e.g., pasture lands and water) and is also responsible for a

large share of greenhouse gas (GHG) emissions (Sentience Politics 2017). In addition, negative environmental and health impacts from such activity have been increasingly put under the lens of the consumers' attention as freshwater pollution from manure or the increasing resistance to antibiotics due to abuse of them as preventative measure in highly intensive industrial livestock production (Agribusiness Accountability Initiative 2017).

These concepts represent innovation in problem resolution and changing cultural mindsets through small steps that contribute to resolving the overarching problem of low SES and the associated problems that reduce quality of life. Money may or may not be the root of all evil. But the following evidence gathered from across the globe indicates that poverty—the lack of money or some form of capital asset—impacts the human condition that could form the modern definition for evil for many who continue to subsist.

1.3.3 The Global Problem of Low SES

Several recent studies on various global populations bring forth the complex nature of low SES as a determinant of public health based on the social, behavioral, and economic limitations associated with this indicator. The scope of the phenomena of plausible economic growth given environmental conditions (e.g., poor air quality, low socioeconomic status) and consequent decline in public health is demonstrated in the following research conducted in diverse geographic locations.

1.3.3.1 Africa, China, and India: Urbanization and Poor Health Outcomes

The urbanization process, broadly defined as the population shift to large cities, is problematic because dense populations lead to fierce competition for access to scarce resources and satisfaction of basic needs. Specifically, diverse nations such as Africa, China, and India among others across the globe, all face the growing impact of urbanization—minimal employment opportunities and housing shortages in densely populated urban locations, leading to slum development and consequent congestion disamenities (Checkley et al. 2016; Ezeh et al. 2016; Lilford et al. 2016). The United Nations indicates that in 2013 nearly a billion people live in slums divided between undeveloped (863 million) and developed nations (70 million) (United Nations Human Settlements Programme 2014, p.2) and expects that number to continue to escalate.

Slums, according to the United Nations Human Settlements Program, are defined by a combination of conditions that include variables of the environment such as deficient sanitation caused by insufficient infrastructure to preserve and provide access to clean water. This characteristic is causal in 2.5 billion cases of diarrhea in children less than 5 years old alone and kills nearly two million people annually

across all ages (United Nations Human Settlements Programme 2015, p.3). A full "80 percent of those [total] cases are in Africa and South Asia" (United Nations Development Programme 2015, p. 3). Other conditions that characterize a slum are the absence of raw materials making development of long-term housing difficult, if not impossible, overcrowding, and the cumulative impact from physical and emotional hazards in the environment.

(Ezeh et al. 2016, p.1):

> Slums are unhealthy places with especially high risks of infection and injury … because health is affected by factors arising from the shared physical and social environment, which have effects beyond those of poverty alone.

The problem of unchecked urban sprawl and the increasing percentage of the population living in slum conditions within urban populations can promote other negative health conditions represented by the onset of pneumonia, asthma, tuberculosis, and other respiratory health problems (Checkley et al. 2016). About 30 million or half of the population that live in slums within India's highly urban population suffers from at least one respiratory ailment in which the cost of medical care and treatment further diminishes their limited earnings by about 10% (Checkley et al. 2016, p.853; Chowdhury 2011). The problem is exasperated because those who dwell in slums are often not granted national rights (e.g., security of tenure), because they do not have any official claims to the land where they have built their makeshift housing (Ezeh et al. 2016, p.5; Subbaraman et al. 2012).

In another scenario, the displacement of Chinese rural farming communities has been persistent for several decades but not very well communicated to the rest of the world. However, the completion of the Three Gorges Dam on the Yangtze River (Vitka 2006) was well publicized and illustrative of the rural farmer population transfer of over one million people adding to the dislocation of millions of Chinese due to various dam projects across the nation (Campbell-Hyde 2012). While forced relocation into urban manufacturing locations is slightly different from the independent movement of a population, the results are still consistent—massive environmental disruption has led to an increase in dangerous social and environmental effects stemming from increased competition for a limited number of jobs and displaced laborers have less opportunity to find work because their skills are often not transferrable. The problem is further exasperated because social networks—a mechanism to find employment—are limited, if available at all.

1.3.3.2 United States

Researchers using a limited sector of the population between the ages of 25 and 35 from self-reported data accumulated from 2009–2012 in the United States Behavioral Risk Factor Surveillance Surveys detect another dimension to the association between economic opportunity and health. "Inequality of economic opportunity, defined as disparities in the prospects for upward social mobility, has come to the forefront of public discourse in the USA and Europe" (Venkataramani et al. 2016, p.1). They explain that options to improve SES conditions are in effect,

dependent on location, the assets at that location, and physical access to those assets at a specific point in time (Venkataramani et al. 2016; Chetty et al. 2014). Their perspective is consistent with the fact that environmental conditions are dynamic in that the same piece of land can morph from agriculture development, factory site, depleted or brown land, renewed community development, natural gas resource, and so on. Thus, even in the land of opportunity, opportunity has environmental limitations and the impact of that limitation can be felt in population health status.

The Venkataramani et al. (2016) study reviewed individual attributes such as age, race, income, and marital status that play a role in achieving equal access to economic opportunity. The researchers also indicated that behavior and the consequences of their habits (e.g., smoking, obesity, sexual activity) and the level of physical activity and reported sick days had statistically significant influence on limiting economic opportunity and consequently, the increasing expectation of poor mental and physical health outcomes (Venkataramani et al. 2016).

Overall, the studies herein illustrate the global problem of lack of economic opportunity leading to poor health. Further, the results demonstrate the universal need for sustainable economic development that continues to shatter the global misconception that Americans, and other nations considered historically wealthy, are somehow invulnerable to the consequences of poverty. Wealth inequality and income opportunity impacting public health is a problem shared across the globe.

In this section, we discussed the global problem of low SES and health decline. Next, we move from simple economic definitions and problem awareness to the more complex nature of economics and the changing role of the environment in economic growth towards a sustainable human development and economic model.

1.4 The Changing Role of the Environment: Modeling Sustainable Human and Economic Development

Economics can be explained in simple terms but that is not to imply conceptual simplicity. This is especially true because the dynamic imbalance and the inherent inequality in the economic problem continuously generate a need for a new view of land, labor, and capital. Land becomes a prominent focus in this section because environmentalists have long battled the advancement of civilization in relation to economic growth. The primary reason for this position is that human growth was associated with an increase in industrialization that translated into the recognizable loss of irreplaceable natural resources for short-term gains. Therefore, this section introduces the concept of sustainable human development, illuminates the flaws of increasing acquisition and the reality that income adjustments do not necessarily equate to improved social status or quality of life but may, in fact, decrease quality of life often reflected in health status. Thus, the section provides a foundation for the conflict in human development and the measure of societal growth through common measures of expenditures on health and gross national product (Statista 2017a; Statista 2017b).

Assessment of human well-being independent of economic growth measurements (e.g., personal income, progressive technologies, modernization) was ushered into existence by Amartya Sen who fathered the advance of sustainable human development in terms that did not limit capacity for existing generations "without compromising the capabilities of future generations" (Anand and Sen 2000; Costantini and Monni 2008, p.868; Sen 2000). The basic paradigm shifts from a "vision of environment as a limit to economic growth" (Costantini and Monni 2008, p.868; Meadows et al. 1972) to examining the contribution of the environment in context with the potential the environment may have towards improving the quality of life. These mechanisms simultaneously address ways to reduce poverty, achieve higher standards of living, and increase human development needs by integrating them into a model of sustainable human development.

Modeling builds examples that test the limit of inputs and projects outputs that offer a new way to view observable data. But models are dependent on consistent performance metrics. The United Nations General Assembly recently incorporated elements of Sustainable Development Goals (SDGs) when they adopted the 2030 Agenda for Sustainable Development in the Fall of 2015 (World Bank 2017). Their actions move from Millennium Development Goals to *World Development Indicators* contained in the World Development Database (World Bank 2016) viewed considering SDGs and their overarching twofold agenda to (1) eradicate extreme poverty and (2) bring into equilibrium the distribution of wealth within and between nations.

Understanding the nature of the new performance metrics may be best illustrated by those authors that operationalize the concept of sustainable human development into a measurable metrics. For instance, Costantini and Monni (2008) expand the context of human development over pure economic considerations using World Bank variables that reflect an opportunity to discern (in)efficient use of natural resources at the country level. They also illustrate how institutions could be a crucial support for economic and human development leading to the desired integration of sustainable development proposed by Sen. This is relevant to the scope of this chapter on the premise that good institutions drive good policy. By combining the Recourse Curse Hypothesis (RCH) which measures the effects of naturally endowed resources on economic growth with the Environmental Kuznets Curve (EKC) approach—a measurement of the effects of economic growth on environmental quality indicating the impact of pollution on population health, it is possible to assess the turning point where sustainable human development can be ensured by good institutions.

(Costantini and Monni 2008, p.870):

> The linkages between the resource curse and the role of institutions may be divided into two strands: where the quality of institutions is damaged by resource abundance and constitutes the intermediate causal link between resources and economic performance, and where resources interact with the quality of institutions so that resource abundance is a blessing when institutions are good and a curse when institutions are bad.

The RCH measures the relationships between level of natural resources against economic growth in three main categories: first, ↑ natural resource and ↓economic

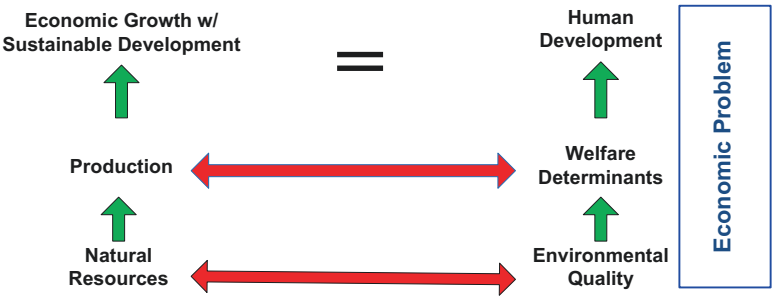

Fig. 1.2 The integration of sustainable development offers a method to balance the twofold goal of economic growth and human development

growth (resource curse); second, ↓ natural resources and ↑ economic growth (e.g., Japan, Hong Kong, Ireland) (resource blessing); and third, ↑relatively high dependence on primary resources, ↑ relatively good growth rate (e.g., Botswana, Norway). Countries like Russia, Nigeria, and Venezuela with an abundance of resources damaged by institutions (curse) could morph into blessed institutions if resource decisions were enhanced at the institutional level. But first, other items with RCH impact had to be taken into consideration such as restrictive trade policies, macroeconomic instability, low human capital accumulation rate, human capital growth through education, and the quality of institutional development and their ability to manage resources.

The relevance of such alternative model is evident in alternate metrics and assessments for the goal of institutional improvements. The model illustrates that (1) strictly economic indicators do not have to be the only measures of advancements in society, (2) these measures provide indicators of institutional disarray that should impact policy decisions in regard to foreign investment and/or foreign aid, and (3) Anand and Sen's Sustainable Human Development promoting the capabilities of people in the present without compromising the capabilities of future generations can be measured, benchmarked, and applied to global economic development to achieve a higher standard of living while maintaining natural capital. Thus, human development can reach a balanced relationship with economic growth with the premise of sustainable development (Fig. 1.2).

The origin of the EKC considers that pure economic growth could only occur at the expense of environmental exploitation but substitutes factors of human development (e.g., health, education) as a measure of the demand perspective to address public opinion. Public opinion represents the desire to reduce environmental decay and introduce structural changes in the economic growth patterns with less industry and higher technology that would equate to a lower global impact of harmful emissions. Here, the inter-relationship of economic growth coupled with the ability to advance technology helps to reduce pollution.

Costantini and Monni's (2008, p.875) integration of the RCH and a modified EKC or (M)EKC was practical because both models introduce factors of human development and can be considered in the determination of causal relationships in

the current battle between human development and economic development with sustainable objectives.

This approach has several important outputs. They (1) establish the ability to measure well-being during various stages of development, (2) provide a tool to assess cost of offering social services in developed nations, and (3) propose a policy framework with built-in decision-making metrics for developed countries to determine the level and type of charitable support to developing nations, if any. The first two outcomes reflect internal national measures against other nations. The third reflects an opportunity to discern (in)efficient use of natural resources at the country level to make informed external decisions about humanitarian support, decisions to build infrastructure for sustainable development, and providing mechanisms that increase human development through access to education and daily needs. Thus, foreign investment decisions contributing to GDP can be profitable and sustainable given policy decisions based jointly on economic, human, and sustainable development goals. Domestic economic and population health decision-making using this foundation can also benefit. Therefore, the concept of development as freedom (Sen 1999) come to life as a measure of societal improvement. One in which natural resources, together with national and global institutions, are means to reach equilibrium between the constructs of social justice and human development in concert with the ecosystem.

1.5 Application and Discussion

Many questions emerge from the conflicting nature of economic growth and human development in which primary inputs to production—land, labor, and capital—impose limits impacting opportunity and well-being. The authors suggest one avenue is posed in the question, "When considering the perspective of human development, does the context of the "Economic Problem" change? Another, in cases of extreme poverty, "What good is maintaining the environment if no one can expect to survive to enjoy it?" Also, "How does one account for countries with limited resources but that demonstrate high rates of economic growth that could not be attributed to technology output?" Finally, "Can Anand and Sen's dream of sustainable human development coexist with economic development?"

First, when considering whether the perspective of human development changes in the context of the economic problem, the simple answer is, "Yes." Explaining how the change occurs is not as easy. Suffice it to say that there is a notable shift from the production or product to exchange to the well-being of the person involved in the transaction. The difficulty in expressing that shift lies in the problem of expressing the contribution of the elements of production in relation to the exchange instead of in relation to wants and needs that drive supply and demand through production input selection and utilization. The problem is reflected in the second question involving the balance between unhealthy conditions of poverty and environmental damage resulting from rapid industrial growth that also impacts

quality of life. Short-term economic solutions that save a population from hunger often have long-term health implications. But how do you tell the parents of a child who is hungry now that they will not build a factory to provide an income source to meet basic needs because at some distant point in the future the environment surrounding the factory will show evidence of air and water pollution?

The third question of inexplicable economic growth for countries with limited resources suggests a signal in the RCH that there is a misallocation of revenues from resource exploitation demonstrated by such countries as Malaysia and Thailand (Costantini and Monni 2008, p.870). Misallocation of revenues is one of the five dimensions of the three primary RCH measures of economic growth in relation to the level of natural resources mentioned earlier. Other dimensions include the Dutch Disease Effect (when a resource boom diverts money from those activities that promote long-term growth), rent-seeking behavior (concentration of rents in the hands of a few private owners that takes away from human resources and small enterprise), the relationship between the quality of institutions and the capacity to manage resources, and the role of human capital—structural investments in human resources. Evidence of these activities should be a strong indicator to reduce or eliminate trade and charitable donations to these nations, or at least to select strict rules for respecting fundamental human rights.

Finally, "Can Anand and Sen's dream of sustainable human development coexist with economic development?" The investment by the UN in Sustainable Development Goals and the selection of World Bank Development Indicators able to measure the achievements of SDGs seem to suggest that this is plausible but difficult to implement in practice.

First, there is an ethical foundation to attempt to achieve equitable distribution on both sides of the economic problem. Second, there is a realistic expectation that a system that heavily favors social justice can lead to lack of incentive to improve conditions and thus, have far-reaching negative repercussions. The influx of nonprofits and federal funding within the country and in global humanitarian efforts reflects the first instance. The second instance can best be reflected in what may be considered folklore but illustrates a good point. Consider the story of the instructor who agreed to combine everyone's grade to demonstrate the repercussions from striving for too much social equity (You Tube 2014). While low-scoring students initially received higher grades because of students who study and normally receive better grades, the advantage was short-lived. After a short period of time, the students who were diligently studying became complacent because their incentive to study was removed. Their logic could be summed in the statement, "Why study for an 'A' and receive a 'B' because someone else did not work as hard?" Eventually, the lack of individual incentive to achieve had the result of innovators losing interest in studying and followers no longer able to take advantage of those who strived to achieve on their own merits. Everyone received a failing grade by the end of the semester.

The drivers of economics and capitalism may be an imperfect system compared to the initial high hopes of socialism illustrated in the prior story. But the elements exist to improve social status when there is a greater understanding of the economic

problem—balancing the needs of the people weighed against diminishing resources. Innovation in policy implementation offering opportunity for human development, abating the division of the wealth inequality or at least addressing the needs of the extremely impoverished, and acting against national fraud or harm against certain peoples provides the opportunity to resolve some of this imbalance by identifying need, recognizing problems, and generating sustainable solutions.

We should now better understand how we got here. Let's imagine where we can go from here.

1.6 Summary

In this chapter, we discussed historical input components of production, touched upon individual behavioral and social determinants, and considered the impact of both social status and environmental pollutants as an outcome of industrialization. We describe how institutional policy can be improved by using indicators reflecting national performance developed by the World Bank that take into consideration a wider scope of factors beyond those limited to economic development. Prominent elements include (1) an introduction to the economic problem in contrast to human development, (2) a foundational basis on the notion of large-scale government policy enveloping the intertwined and complex concepts of economic development, human development, environmental impact, and public health that is the essence of sustainable development, and (3) to address the question of reasonable limits of global economic expansion by understanding ways to induce collective action for civic engagement and provide information to guide policy makers in order to improve government accountability, transparency and reduce internal corruption.

Glossary

Capital A form of currency or asset (e.g., money, land, machinery, technology) that indicates a strong financial status that can be used to support new business development as an investment for profit; a key input in production

Commerce The introduction of logistics (e.g., railroad, truck, aircraft, ship) to transfer finished goods or services to another location for payment

Economics A social science utilizing theories of management and economic systems emphasizing the exchange of natural resources to produce and transfer goods and services to consumers; study of the creation and distribution of wealth to communities with limited natural resources

Economic Growth Increasing opportunities in terms of new technologies, information, communication, and competitiveness

Economic Problem The difficulty in balancing population needs that consume natural resources against the reality of limited resources

Equitable Distribution Ability to balance divergent needs of a population in a manner that accounts for wealth inequality through the interpretation of a variety of inputs including who benefits from labor income, product output, access to land, etc.

Entrepreneur A person or group of people who assumes the investment risk of a new business to try to achieve the benefits of productions, and/or the decision-maker of a new business that organizes the daily operations for profit

Environmental Kuznets Curve (EKC) The effects of economic growth on environmental quality

Gross Domestic Product An accepted annual measure of the cumulative economic activity of a nation representing the total monetary value of production, including finished goods and services, adjusting for imports

Gross National Product (GNP) The sum of gross domestic product and the net income from foreign investment

Human Development Consists of two dimensions that, in turn, permit access to opportunities to progress in other areas of life—(1) directly enhancing human abilities (e.g., quality of life, education, longevity) and (2) generation of conditions to support the first dimension (e.g., civic engagement, environmental sustainability, safe environments, human rights)

Industrialization When a society moves from an agricultural economy to one that relies on the manufacture of goods

Opportunity Cost Views the cost of decision-making in comparison to the next best alternative that was not selected; highlights the value of various options by comparison

Resource Curse Hypothesis (RCH) Measures the effects of naturally endowed resources on economic growth

Socioeconomic Status (SES) A common classification of high, middle, or low SES in the social sciences representing personal or group social status based on a variety of attributes such as level of education, income, and job that is commonly linked to expected levels of health and representative of unequal resource distribution

Sustainable Development The same level of well-being achieved for the present generation that will be maintained at the same level for the benefit of future generations

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