



Aligning Economic Measurement with Well-Being: Sustainability

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Abstract

Gross domestic product (GDP) has been the prevailing global metric for measuring economic growth for the past 70 years. This is the same time period that is credited with the observation of manmade climate change. The observed relationship is arguably related to the goal of GDP growth without the constraint of “how” it is attained. Further, the GDP-based growth model, predicated on theoretical assumptions of human behavior, has enabled cultural transition to foster individualism, facilitate competition, and enable material accumulation, essentially endogenizing neoclassical behavioral assumptions while limiting perception of value to market outcomes: prices. To the extent that market prices and participants do not include holistic impacts of resource use and instead determine value based on immediate gratification, GDP growth is correlated with negative externalities, which impose limits on the future quality of life. From this perspective, it is evident that the use of economic metrics alone, without articulation or determination of social responsibility, can affect environmental sustainability and result in outcomes that are inconsistent with the intention of growth, specifically well-being. In this chapter, we explore how GDP gained traction on a global scale

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and how the indicator is tied to climate change, as well as environmental degradation and intra- and inter-species exploitation. We then consider the process needed to adjust economic assessment to align with well-being and promote sustainability.

Keywords

GDP · Stakeholder engagement · Economic literacy · Culture · Materialism

1 Introduction

The gross domestic product (GDP) indicator measures the market value of production capacity of a country, but due to the relationship between production, employment, and consumption, GDP is used synonymously as a measure of well-being. The underlying assumption in this relationship is that income promotes consumption capacity, which, in turn, increases individual satisfaction. Here we provide a history of GDP. We include tangible examples of the relationship between GDP, unpaid work, and environmental and social justice related to the exclusion of non-market costs and highlight how economic growth is both inconsistent with well-being and may undermine the potential for achieving sustainability.

1.1 What Is GDP?

Gross domestic product (GDP), a creation of the United States, is characterized as an achievement of the twentieth century by the US Department of Commerce. GDP measures final purchases by households, business, and government. The components of the expenditure calculation of GDP include consumption (C), investment (I), government (G), and net exports (X – M), which is exports minus imports. GDP represents the sum of these values: $GDP = C + I + G + (X - M)$. The primary driver of GDP in the United States is consumer spending, which accounts for more than 65 percent of GDP.

Credited to the efforts of Nobel Laureate Simon Kuznets (1934), the indicator's first iteration as gross national product (GNP) was an outcome of the modern system of national income accounting. In the 1930s, national income accounting was developed in the context of the Great Depression to measure economic productivity to better assess aggregate economic activity. With post-World War II efforts to stabilize the global economy in the 1940s, the use of the indicator as a gross measure of economic activity gained traction.

In 1944, the Bretton Woods Conference, which was attended by representatives from 44 countries, established the International Monetary Fund and International Bank for Reconstruction and Development (now part of the World Bank) to provide access to funds and establish policies to facilitate trade and global economic growth and stability. Given the relative strength of the US economy at the time, the United

States dominated both institutions. As a result of US influence, following a transition from GNP, in the 1990s, GDP became the standard for measuring economic growth within a country, as well as a ranking metric across countries (Lepenies & Gaines, 2016).

GDP measures the market value of all (gross) final goods and services (product) produced within a country (domestic) at a specific point in time. From this perspective, GDP provides an aggregate value but no detail with respect to the distribution of goods and services, quality, or standard of living of a country's inhabitants. However, given the relationship between employment, income, and consumption, there is an implied connection between employment growth and GDP. An increase in employment is assumed to increase consumption, which in turn affects GDP growth. As a result, employment is a routinely evaluated economic indicator.

On the surface, the relationship between GDP and employment may not appear to be problematic; after all, income determines how much can be purchased and as a result the accessibility of satisfying needs and wants. This is one reason why GDP has been attributed synonym status with standard of living (The Federal Reserve Bank of Boston, 2003), quality of life, and societal well-being, not to mention an attribution signifying the "wealth of a nation." But these definitions are consistent for situations where a formal market mechanism exists, in other words, where monetary exchange is the basis for meeting needs and wants. Not all goods and service are traded through a formal market channel, and this condition may be more prevalent with specific occupations and differ significantly across nations. By relying on monetary values, GDP has unintentionally led to the evaluation of all economic activity in monetary terms. As a result, unpaid work though it may be highly productive may not only be uncounted in GDP, depressing the perception of productivity in a country, but also result in undervaluing occupations where a monetary income is not generated (Venkatesan & Luongo, 2019). The informal sector is an example of the former and can include trade and subsistence agriculture, both of which promote access to goods and provide for caloric needs, respectively. Parenting is an example of the latter.

Raising a child is an unpaid work. It does not add to GDP. However, paying for childcare does. So, a perversion of the economic system is the trade-off between unpaid and paid work, even when the unpaid work may have greater value. Arguably, children are better off raised by their parents than by hired caregivers. But in a formal market economy, parents can provide for material needs and wants only with income. The trade-off reinforces materialism as a signal of affection, care, and well-being and directly reinforces the consumerism fostered in a GDP-based economic framework.

Through validating formal market-based consumption, standardization of the measurement of a country's economy to GDP affects the culture of a nation. Basically, with GDP only income is valued, and as a result, unpaid labor is, by definition, not economically valuable and uncounted. Only paid employment and production for consumption are the focus of economic measurement. However, though GDP increase is tied to consumption, so also is resource use, resulting in a normalization of environmental degradation, which results in ecosystem and

biodiversity loss, as well as poverty. Market values are determined by the relative strength between suppliers of resources and the demand for them. The net result is the continued and vicious cycle of the exploitation of the most vulnerable: the environment and the poor. This underscores Kuznets' comments, "the welfare of a nation can scarcely be inferred from national income" (Fioramonti, 2014, p. 15).

1.2 How Has GDP Affected Social Norms?

GDP has transformed social norms, establishing the acceptability of excess to replace the frugality that characterized society at the indicator's inception. The transition to consumerism has been both facilitated and maintained by government action. Tax reductions and financial transfers are used to boost consumption when it slows. Similarly, central banks target interest rates to promote GDP growth, lowering rates to incentivize debt-funded consumption.

Further and related, need does not determine the supply of a good or service; rather, advertising and marketing are the basis of creating demand for products. Planned and perceived obsolescence, in turn, induce a requirement for replacement resulting from use or appearance, respectively. All the while, resource use in production and the impact of disposal remain largely unnoticed, given the economic system's legitimized preoccupation with consumption. The latter attribution mirrors the self-gratification and convenience that have become the expected characteristics of consumer products.

A tangible example of how GDP has affected daily transactions is plastic bottled water. In the United States, single-use plastic bottled water represents over 50 percent of the beverage market, and estimates are that nearly 70 million are consumed per day. The growth in this market is largely attributable to marketing, which has promoted the health aspects of drinking bottled water in lieu of tap.

The average retail cost of a single-use plastic water bottle of 12 ounces in size is \$1.10. However, the wholesale price is approximately \$0.10. The \$1.00 difference is the profit to the retailer. The wholesale price reflects the low cost to no cost of the water in the bottle and the commodity value of the plastic used to make the plastic bottle. What it does not reflect is the environmental impact of petroleum extraction for petroleum-based plastics or the monoculture impact of bioplastic material. Also excluded are the human health impacts resulting from the ingestion of chemical leachate from the plastic into the water it contains. Plastic leachate has been linked to obesity, infertility, ADHD, cancer, heart disease, autoimmune disease, and endocrine disruption (Symeonides et al., 2021). Perhaps even more significant from a time and uncertainty perspective, the disposal of the plastic is not accounted for.

Presently, most plastic is landfilled where it may thermodegrade, releasing methane, break down into microplastics, or remain in its form. A smaller but increasing proportion is incinerated, releasing toxic chemicals into the air, and the smallest percent is recycled. Based on the chemical properties of plastic, recycling still requires virgin plastic to strengthen the recycled product. Further, recycled plastic is typically used in the manufacture of an alternative to the initial product.

Essentially, this is waste diversion that both requires new bottles to be made and yields more plastic in the environment. Given that plastic will not biodegrade, the convenience benefit of the \$1.10 convenience product is insignificant compared with the qualitative impacts of its life cycle from production to disposal. Stated alternatively, if assigned monetary values, the adverse impacts of single-use plastic water bottles are significantly more than the financial returns. Including the water justice issues related to communities that are losing water access because of commercial bottling operations only magnifies the imbalance considering global water scarcity issues. However, despite the costs, the monetized benefit of the product along with its routine obsolescence makes single-use plastic water bottles well aligned to a GDP framework.

Single-use plastic water bottles are one of the many examples of planned obsolescence. This attribution can be given to clothing, cellphones, and nearly all consumer products. Essentially these products are designed for the dump, which in effect is the growth driver for consumer-based GDP. This ties back to the relationship between GDP and exploitation of the environment and the vulnerable. Specific to clothing, estimates are that to grow cotton for one cotton T-shirt requires more than 713 gallons of water (2700 liters). At an average daily consumption of 0.5 gallon a day, one T-shirt equates to almost 4 years of water consumption. Further, the price does not include the ecosystem damage related to a monoculture cotton plantation or the chemical impact from bleaching and coloring the cotton. Emissions from transportation and the end-of-life impact of the T-shirt are also not considered. For cellphones, these two attributes are also true: the variation is that the environmental impact includes mining and the social impact is found in the use of child labor. Children as young as 7 years old have been found mining for cobalt in the Congo in unsafe and abusive conditions.

From a global perspective, the most significant environmental impact attributed to GDP-based growth has been the increased speed in climate change due to fossil fuel-based energy production. However, a conundrum exists in that GDP growth is energy dependent. Without a zero emissions infrastructure to substitute for fossil fuels, GDP will contract. So, it is the very use of the metric to rank economic progress that has become the hurdle to enabling policies to promote sustainable economic growth.

2 Social Change, Cultural Shift, and New Economy

GDP includes the market value of products and services in the immediate period. As a result, the short-term perspective of GDP disincentivizes investment in the future in lieu of immediate gratification. Further, GDP compounds market-based inequities, as market prices are not reflective of the true cost. However, the limitation of GDP is not in its calculation but rather the exclusion of qualitative variables in the decision-making of production and consumption. GDP can be a measure of progress but not by relying on quantitative or formal market-derived values alone. In other words, what a society values, such as sustainability, environmental and social justice and

economic equity, needs to be included in decision-making to be reflected in economic outcomes. For example, if child labor is unacceptable, products manufactured with child labor would not be bought; instead, they would be substituted with competing products employing acceptable labor. The outcome would not be aligned to the amount of consumption as the indicator of gratification but the alignment of consumption with present and future well-being both inter- and intra-community.

Given the strength of consumer expenditures in developed countries' GDP, transformation to sustainable development may be catalyzed through education – economic literacy – that promotes a shift in consumption value orientation to include a responsibility for the holistic impact of a given consumption choice: a conscience-based framework. The result could potentially lead to internalization of externalized costs of production to ensure sustainable use of environmental resources as well as labor. In essence, if consumers had the information to make a rational choice – to be the rational economic agents that the pricing model of economics assumes but that social frameworks and institutions do not universally foster or develop – consumers would be better empowered to exercise the power inherent in consumption decisions. To the extent that cultural norms are consistent with stewardship, consumer behavior would then implicitly include environmental and social responsibility.

For example, there is no market price for air; it is assumed to be free, and more importantly, it is also required for life. Correspondingly, it is a costless component of the production process; waste has been released into the air for years. If there had been a cultural norm that prevented the release of airborne waste that was embedded in demand, the pollution that has collected in the atmosphere for the past 300 years could have been averted simply by the social recognition of its impact relative to the benefits resulting from its creation. As simple as it may sound, consumers could have promoted the welfare of the atmosphere through their collective demand that air quality be preserved.

The moral values embedded and communicated within demand and supply determine the way a need or want is attained. The implicit morality simply stated is assessed as the net benefit on an aggregate basis, which means that the benefit to a few can be justified if it exceeds the costs to even the many. To the extent that there is no discussion of the values and behavioral factors assumed and reflected in demand and supply – arguably, implicit values – the values and the subsequent behaviors become endogenous to the economic system. The explicit awareness of present behavioral assumptions inclusive of the “unlimited wants” of consumers, the profit maximization motivations of producers to meet investor returns, and the understated resource depletion resulting from externalized or understated costs offer the potential to modify active and embedded behavior.

Consumption choices are based on demand and supply of a good and are identified with satisfying a need or a want. The impact of consumption decisions can be significant when there is asymmetry of information; fundamentally, there is a relationship between economic and environmental outcomes and consumption choices. Purchases affect labor and environmental resource use. However, most purchase decisions are made through a market mechanism, where the consumer is not aware of the entire production process and waste is not a factor in the

consumption decision. This limitation in information transparency often creates a disconnect between the social and environmental justice sensitivities of a consumer and the realities of their consumption choice in enabling and maintaining the values that they espouse.

3 Economic Literacy and Internalizing Externalities

In economics, equilibrium, the point at which demand and supply are equal, is assumed to yield a market outcome where resources are efficiently allocated; neither demand nor supply can be made better off without making the other worse off. The price at which the quantity demanded equals the quantity supplied is therefore expected to embody the cost associated with production, including return to the supplier and the benefit of consumption of the good or service. However, production and consumption are not limited to the transactional nature of exchange of the final good at the determined market price. In the process of production and consumption, there are costs that are not factored that impact the well-being of the economy at large, and these are referenced as externalities. In essence, externalities arise when an individual or firm engages in activities that influence the well-being of others and where no compensation is provided in exchange for the imposition. The lack of inclusion of externalities in the cost assessment or consumption expense of a particular good leads to the undervaluing of that good and potential for both overconsumption and heightened waste. From an economic growth perspective, since prices are a signal of resource use, underpricing may lead to higher consumption, fostering overuse beyond natural regeneration rates and ultimately unsustainable outcomes, as most readily apparent in the speed of climate change.

Each step in a product's lifecycle may have costs that are not captured in price because firms have no incentive to include costs that they do not need to address. Their focus is profit maximization (investor returns), and individuals presently are assumed to be incentivized to maximize consumption subject to an income constraint – the lower the prices, the more of their insatiable desire to consume can be fulfilled. Lifecycle assessment enables evaluation of a process from the stance of an impartial bystander and, given the pre-existing moral responsibility of the observer, offers the opportunity to internalize externalities in production and consumption that are contributors to environmental and social justice, attributes of sustainability (Smith, 2002, p. 23).

Typically, externalities are characterized as negative, signifying that the externality yields an adverse outcome. These externalities are referenced as being negative externalities. However, there is a potential that a positive outcome could be generated, leading to a positive externality. In the discussion of externalities, it is often assumed that market participants perceive the externalities generated by their actions as acceptable due to their focus on the immediate gratification of their needs. For the producer, this equates to externalizing the cost of the disposal of waste products into waterways and the air, where no cost is directly borne to adversely impact profits, but arguably intertemporal costs can be assessed that may impact the enjoyment and

longevity of multiple life forms and generations of human life. For the consumer, the externality can be evaluated in the indifference to waste creation at the point of the consumption decision or even the externalities associated with the production of the good or service being purchased, the supply chain. In the case of the former, the cost of the disposal of packaging material is typically marginal to zero, relatively negligible, but disposal creates a negative externality in the landfill, incinerator, or recycling plant that could have been avoided with a thoughtful exercise of demand. At present, the type of internalizing of externalities that has occurred has been limited to quantifying the externality to an overt cost. However, to the extent that the costs may remain understated, and the market mechanism is not cognizant and focused on the elimination of the externality-based cost but rather the minimization of overall costs, this process has yielded suboptimal outcomes. For example, assume that a firm produces ambient pollution because of the incineration of waste. If a governmental regulatory body institutes a fee or cost for pollution, effectively charging the firm for the ability to pollute the air, the producer can delegate responsibility for environmental stewardship to the price of pollution. Additionally, depending on the demand for the service offered, the producer may be able to not only transfer the costs now associated with polluting activity to the consumer but may also be able to maintain the pollution level. The more the consumer needs the good, also referred to as being inelastic – limited price sensitivity – the more of the fee can be transferred. Assuming that the good is a necessity, the consumer will be inelastic to the change in price and maintain the need-based quantity of the good. In this example, the negative externality related to internalizing the cost has not changed. Instead, only the responsibility of pollution has been transferred to a cost, revenue to the regulating body has been generated, and the consumer has suffered erosion in her overall disposable income and purchasing power. The impact of the latter outcome may be an unexpected contractionary phenomenon to GDP as less money will be available for other consumption expenditures. Fundamentally, the consumer has continued to maintain demand because the complete impact of the externality being created by their consumption is not understood. Even in the case of inelastic demand, consumer awareness can promote regulatory intervention that yields a change in the product provided.

Externalities are defined as a type of market failure based on the premise that optimal social outcomes result from individual economic agents acting in self-interest. However, if, instead of being a market failure, externalities could be evaluated to assess and develop an optimizing strategy between individual interests and enhanced social outcomes, externalities could be internalized within the market model as a preference. Perhaps externalities only indicate a lack of holistic awareness on the part of the consumer and producer or a cultural bias toward immediate gratification. These characteristics can be potentially modified through education. Optimal and universally acceptable strategies could then be adopted to promote sustainability. The success of this internalization strategy relies on the development of the educated rational economic agent as a consumer. If consumers are aware of the responsibility inherent in their consumption and are aware of the environmental and social impact of production processes, consumer demand can create the coalescing

framework to augment preference to exhibit demand for sustainably produced products. The augmentation in demand does not allow for the opportunity of delegation of responsibility of pollution capacity to a cost or, alternatively, the incorporation within a cost minimization framework. As a result, the change in preference and subsequent modification in demand promotes the development of market outcomes that are environmentally and socially optimal from the position of what is supplied.

4 Stakeholder Engagement

Given that the culture of expenditure as formed through a GDP-focused economic framework has affected stakeholders differently depending on variations in demographic characteristics (e.g., age, sex, family status, education level, income, occupation, and race), religious and spiritual beliefs, length of residency and citizenship status, as well as other characteristics, education related to economic processes and the relationship between consumption-production and externalities may not be sufficient to foster common behavioral change related to environmental protection. Evidence suggests that even with consumers who identify as environmentally sensitive, cognitive dissonance, habit, access, and other limitations are related to the visibility of a value-action gap, where beliefs are not mimicked in actual behavior (Venkatesan et al., 2021).

Realistically, reducing information asymmetries to promote decision-making consistent with conscience and empathy is therefore necessary but not sufficient. Where education may be insufficient, stakeholder engagement recognizes the cognitive barriers created because of historical educational inequity, social norms, and other barriers observable in the value-action gap. Stakeholder engagement fundamentally requires education and information dissemination that is congruous with endogenized perceptions of “what’s in it for me” and other manifestations of individualized decision-making prevalent as a result of prevailing and economic framework-related cultural norms, along with other incentives that affect individual behavior, which may include a predisposition to community welfare. As a process, stakeholder engagement recognizes that individuals and groups within society may be motivated by different objectives. In implementation, therefore, the process requires communication strategies that recognize the variation in incentives and incorporate these in fostering a common outcome that is beneficial to the whole.

The stakeholder engagement process identifies stakeholders in relation to their proximity to both the effect on the change being implemented and the impact of the targeted change to them. The structure, as provided in Fig. 1, follows a multi-dimensional simultaneous process where change is being addressed at the micro (individual)-, meso (community, country)-, and macro (global)-levels based on the incentives that determine the operation of each level and alignment of these to a common outcome. From the perspective of environmental stewardship, these levels are increasingly apparent in the present US context both with respect to activism within each and the limited to lack of alignment across and within each stratum.

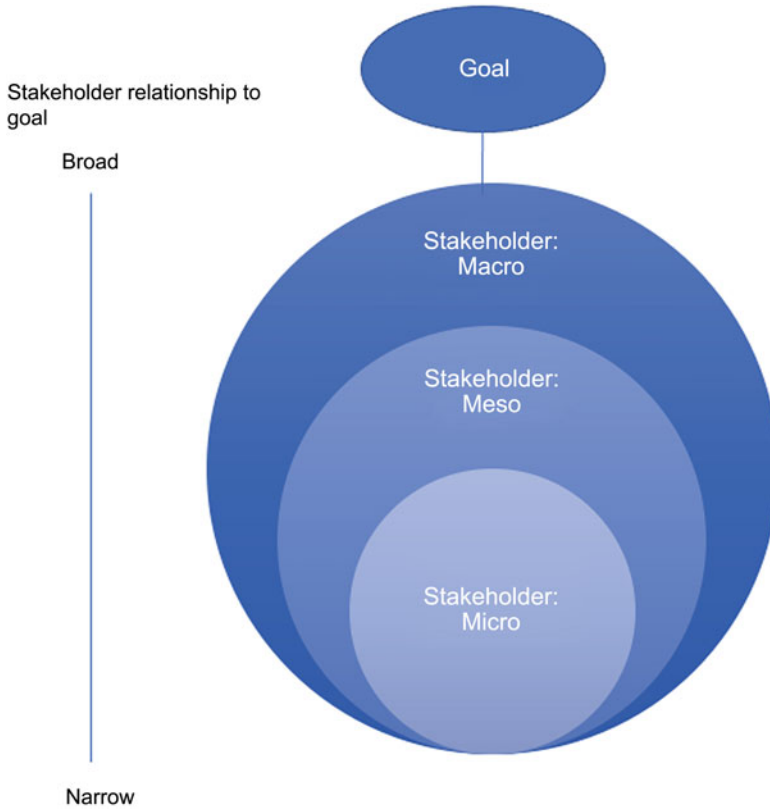


Fig. 1 Micro-, meso-, and macro-levels of stakeholder engagement. (Source: Author)

On a micro-level, grassroots activism has increased discussion on environmental degradation and sustainability (The Goldman Environmental Prize, 2021). However, a lack of common perception on the definition of sustainability as well as an approach to environmental protection (e.g., anthropocentric, ecosystem-centric) has yielded inconsistent outcomes. On a meso-level, variations in perception of what defines community have resulted in limited civic action at the local level and a view that regulatory change is both the salve and needed from a national platform (River, 2021). Looking at the government or regulatory level, the prioritization of the environment is affected by the focus on economic growth, which due to resource utilization inherently affects resource utilization rates and can be argued as incompatible with achieving sustainability. This latter attribute also affects the legitimacy of profit maximization and individual gratification without constraint other than income, effectively providing a common thread among stakeholder categories. From this perspective, the measurement and framework of the economy offer an opportunity for alignment of incentives, providing a justification for both facilitating economic literacy across stakeholders and also modification of economic evaluation to a sustainability-aligned indicator, in lieu of GDP (Bianco et al., 2020; Fleurbaey, 2009). The challenge remains at the global

Table 1 Principles of stakeholder engagement

Identify the goal
Determine stakeholders and stratify stakeholders based on their relationship to the goal
Determine stakeholder incentives
Determine the appropriate communication channel for each stakeholder, and map the relationship between stakeholders; use this mapping to develop a communication nomenclature that assures the broadest reach
Develop messaging strategies that align each stakeholder's incentive to the identified goal
Communicate the goal across stakeholders using education to promote the alignment of stakeholder interests with the goal
Facilitate communication across stakeholders to ensure that there is alignment across stakeholders with respect to a common goal
As the goal is being disseminated, assess stakeholders for ideas and suggestions, providing flexibility to augment the engagement process and the goal as new information surfaces
Maintain communication channels and facilitation of communication between groups even after the goal is reached to ensure continuous improvement and the long-term viability of the intention of the initial goal

Source: Venkatesan et al. (2020)

level to the extent that limited traction exists for cooperation across countries. In this manner, given the limited enforcement at the global level, community grassroots and national regulatory action are requisite for implementation of global standards, as the latter will require self-enforcement. The process of engagement at the micro-, meso-, and macro-level could follow that of Venkatesan et al. (2020) as provided in Table 1.

This process incorporates the value of the process itself as opposed to the goal orientation of present engagement processes. The inclusion of continuous improvement in stakeholder engagement process effectively reinforces the significance of process and recognizes the dynamic aspect of engagement. From this perspective, it can also be noted that stakeholder engagement for sustainability is both educationally transformative and culturally transformative. To the extent that stakeholders understand the implication of GDP-focused economic policies on cultural norms, there is an opportunity to modify and align cultural norms with conscience-based decision-making that considers environmental parameters. In turn, by redefining societally acceptable behavioral standards with respect to the environment, inclusive of other species, there is the potential to establish an economic framework that aligns to these norms (dos Santos Gaspar et al., 2017). So, instead of an economic framework determining economic activity, economic agents define the economic framework by engaging in activities that align to their values. Culture is defined by environmental understanding and defines the economic system to align to these sentiments and perceptions.

5 Final Comments

This chapter has provided a model for change that centers on education but also highlights the need for individual awareness of the significance of economic frameworks in both influencing and reinforcing cultural norms. The discussion provides

an overview and methodology for stakeholder engagement that relies on a process-driven approach that incorporates continuous improvement. The most significant attribute of the discussion is the reliance on economic literacy as a tool for change. The limitation of this method is that there is a high cost of communicating with all stakeholders and the ability of establishing alignment to a common outcome focused on sustainability may be challenged by the entrenchment of the social indicators of GDP (i.e., self-gratification and profit maximization) on the part of some economic agents.

The benefit of the discussion, however, is the focus on the relationship between GDP and culture and the simplicity related to changing an economic measure relative to the holistic impact that this action creates. At the present time, there is discussion in regulatory and academic circles about the need to reevaluate economic purpose. The move from a GDP indicator has already been implemented by a few countries. The modification in measure has resulted in the use of measures of well-being, happiness, and environmental protection. Additionally, given that these attributes are related to not just individual existence but the experience of an individual within a society, they are also aligned with fostering collectivism (Bahadur et al., 2013). Given that trust and collectivism are highly correlated, and trust is an indicator of resilience, the speed of climate change activity may be better addressed (i.e., mitigation, adaptation) by those communities that are culturally aligned and economically supported in being a collective (Ntontis et al., 2020).

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