GLOBAL RESOURCE AND SOCIO-ECONOMIC CHANGE: A CALL FOR SOCIAL WORKERS PROFESSIONAL INTERVENTION

A. E. Okafor[1*] and C. A. Eneh[2]

[1]*Department of Social Work, University of Nigeria, Nsukka*
[2]*Department of Agricultural Economics, University of Nigeria, Nsukka*
[*] *Corresponding Author,* Email: agnes.okafor@unn.edu.ng

Abstract

Social change is the alteration of the social order of a society which may include changes in social institutions, social behaviours or social relations. Sustained at a larger scale, it may lead to social transformation or societal transformation. Via anthropogenic social change, extraction of the earth's natural resources tripled in the past five decades, related to the massive build-up of infrastructure in many parts of the world and the high levels of material consumption, especially in upper-middle and high-income countries. Material extraction is expected to rise by 60 per cent by 2060 and could derail efforts to achieve not only global climate, biodiversity, and pollution targets but also economic prosperity and human well-being. Thus, the need for this study to upheap urgency actions for, sweeping policy changes to bring humanity to live within its means and reduce this projected growth in socio-economic changes and resource use by one third, while growing the economy, improving well-being, and minimizing environmental impacts.

Keywords*: Socio-economic change; social work; anthropogenic activities; global resource*

Introduction

Change is always happening. These changes occur over time and often have profound and long-term consequences for society. As a result of social change; relationships have changed, institutions have changed, and cultural norms in workers' rights, civil rights, women's rights have changed. Sociologists define social change as changes in human interactions and relationships that transform cultural and social institutions. Interestingly, these changes in human relationships and interactions – collective or individually – connote positive or negative change. Either positive or negative, this change extends human-space. In fact, anthropogenic activities (socio-economic change) and social change impact the functional integrity of the biosphere with the attendant ecosystem degradation and climate change that leads to variability of rainfall affecting agricultural productivity, food security and health of the population (Kepner, 2006; PreventionWeb, 2021; WHO, 2021a; Dunfey, 2023).

The world is in the midst of a triple planetary crisis of climate change, biodiversity loss and pollution and waste. The global economy is consuming ever more natural resources, while the world is not on track to meet the Sustainable Development Goals (UNEP, 2024a). Extent of exposure to this global crisis or socio-economic change, according to the World Economic Forum's Global Risks Report (2024) will stem from misinformation and disinformation (education) – the biggest risk – in the short-term. In the longer term, climate change, climate change-related variables and other top 10 variables will influence the extent of exposure global populations will face of the planetary crisis. In fact, two-thirds of global experts anticipate a multipolar or fragmented order to take shape over the next decade. Thus, the need for this study.

Social and socio-economic change: case of resource exploitation

Extraction of the earth's natural resources tripled in the past five decades, related to the massive build-up of infrastructure in many parts of the world and the high levels of material consumption, especially in upper-middle and high-income countries. Material extraction is expected to rise by 60 per cent by 2060 and could derail efforts to

achieve not only global climate, biodiversity, and pollution targets but also economic prosperity and human well-being (UNEP, 2024a).

The UN Environment Assembly report (2024) finds that growth in resource use since 1970 from 30 to 106 billion tonnes – or from 23 to 39 kilogrammes of materials used on average per person per day – has dramatic environmental impacts. Overall, resource extraction and processing account for over 60 per cent of planet-warming emissions and for 40 per cent of health-related impacts of air pollution. The extraction and processing of biomass (e.g., agricultural crops and forestry) accounts for 90 per cent of land-related biodiversity loss and water stress, as well as one-third of greenhouse gas emissions. Similarly, extraction and processing of fossil fuels, metals and non-metallic minerals (e.g., sand, gravel, clay) together account for 35 per cent of global emissions aggravating persisting planetary crisis whilst increasing the likelihood of climate change, nature loss and pollution-driven crisis from unsustainable consumption and production (Andersen, 2024).

Resource-exploitation, social change and education challenge linkages

Nigeria; belongs to the league of natural resource-rich countries which suffer the paradox of plenty or resource curse; lag behind countries without an abundance of natural resources in economic development since deliberately inept to use its wealth of natural resource endowment to boost development outcomes. The governance is repressive, corrupt and badly-managed. Conflicts are provoked among different societies, groups and factions fighting for their share and sometimes emerging as separatist groups. Government's ability to function effectively is undermined. Thus, quality governance and economic performances are eroded amidst education challenged-scenery (Philippe, 2006).

The socio-political playground was not level-founded in view of the neoclassical dependence development model between the oil-exploration countries/corporations and the oil-rich country Nigeria hence the resource-curse of the country. Subsequently, and in order to protect and perpetuate the interest of the rich countries of the explorers,

the exploration corporations dichotomize the citizenry of the host country with rewards for the native "comprado elite groups". This neoclassical dependence development model gained also replication at the internal dimensional level between the federal government (the "centre") and the host community whose "comprador elite groups" are rewarded. Besides, the government (the "centre") and the "comprador elite groups" sought inappropriate choices, designs and teleguided development programmes and projects (including CSAs) for the communities to, remain non-performing and unsustainable, resulting in poverty elongation and perpetuation in the host country/community (Eneh, 2011d; Amao, 2009; Barkemeyer, 2009; Jhingan, 2007; Amaeshi, Adi, Ogbechie and Amao, 2006; Todaro and Smith,2006; Miles, Munilla and Darroch, 2006). Consequently, there is widening, crippling poverty in the midst of corporate social actions (CSAs) of oil exploration corporations in the River Niger delta region of Nigeria. The situation calls for an interplay of moral and economic considerations (Turyasingura, 2022).

On the other hand, over the years, the economy's dependence on natural resource exploitation and taxing the citizens was utilised to run the government. Particular were, military regimes where the people conventionally had no bargain over tax payment and demand for accountability. To guard against threat from civil service and civil society, institutions were weakened hence, evolving poor service. If the poorly served public complains, the military government uses the oil money to motivate the armed forces to clamp down on the protesting citizens. Dulling competitiveness in the productive sectors, e.g. education, agriculture and manufacturing (*Dutch disease*); revenue from natural resources facilitated stronger exchange rate culminating sometimes in wage increase. This volatility-play created havoc with government planning and; abrupt changes in economic realities that resulted from this often; provoked widespread breaking of contracts and/or rule of law wear away. Fluctuation and volatility in crude oil price influenced uncertainty in budget, provoked breaking of contracts that further eroded the rule of law in Nigeria. Skewed to less production, the

anticipation of revenue from oil export encouraged the government to accumulate debt (loans) further compounding the resource-curse (*Dutch disease*) by the cheaper interest rate from increase in real exchange rate. Power and authority became juicy and deliberately acquired or seized to maintain corruption. Growth-oriented economic policies gave way to impunity, lawlessness and further under-development. Economic diversification was neglected, especially as the resource extraction was more lucrative (short- and mid-term). The natural resource industries paid far higher salaries than others therein inflating the system. This attracted best talents from both private and government sectors, thereby damaging those sectors by internal brain-drain worsen by neglect to empower and functionally educate people. Human rights fell and despite the rise in petroleum price overall welfare, declined (Eneh, 2011f; Bräutigam, 2008).

Hence, illiteracy, poverty, denial and lack, unemployment and under-employment, water and sanitation crises, poor medical services, poor child development and welfare, and gender issues existed in most Nigerian households. Community corporate involvement (CCI) was peripheral and did not address poverty of the citizens, nor help tackle the development challenges in host communities. CCI practices for poverty panacea was of the form of unsustainable donation or philanthropy. Corporate social actions (CSAs) of petroleum exploring corporations was introduced both in host exploration-communities and overall Nigeria but crippling poverty existed. Attendant restiveness in the oil-rich zones ensued as indices of poverty were worse in communities where oil corporations embarked on more CSAs than in others without oil exploration (Akintunde, 2008; Nwosu, 2008; Sobowale, 2006; Gyamfi, 2006; Famakinwa, 2006). Trick taunted reforms agenda and programmes articulated by the leader's kept majority of Nigerians in chronic poverty. It was a case of weaponizing poverty and "misery-go-round" for most Nigerians (Eneh, 2011e; Onyekakeyah, 2008; Ebigbo, 2008; Okonjo-Iweala and Osafo-Kwaako, 2007; Onah, 2006).

Even Abuja, the federal capital territory, is fast becoming a show of the characteristic poverty and misery of ghettoes, as slums and their dwellers, have taken over 30 slum neighbourhoods. The slums are

characterized by poor sanitary conditions, environmental degradation and pollution, various infections and disease outbreaks (Ezeh *et al,* 2017; Aduge-Ani, 2013). Since Nigerian population is one-fifth of Africa's, this development quagmire of; misery, malnutrition and attendant health issues among slum dwelling/slum dwellers and their children (Lilford, Oyebode, Satterthwaite, Melendez-Torres, Chen, Mberu *et al* (2017; Firdaus, 2012; Karim, 2012; Yardley, 2011) has serious implications for the continent.

Social and socio-economic change: case of water crisis and water poverty

At present, water security, the capacity of a population to safeguard sustainable access to adequate quantities of water of acceptable quality, is already at risk for many, and the situation will become worse in the next few decades (Burek et al., 2016). According to World Water Assessment Programme (2018), clean water scarcity is a major issue in today's' world of 7.7 billion people. The strain on the water system will grow by 2050 when the world population will reach between 9.4 and 10.2 billion, a 22 to 34% increase. The strain will be aggravated by unequal population growth in different areas unrelated to local resources.

Currently, slightly less than one half of the global population, 3.6 billion people or 47%, live in areas that suffer water scarcity at least 1 month each year (World Water Assessment Programme, 2018). According to another report (Mekonnen & Hoekstra, 2016), the number is even larger and rather, 4.0 billion people, or 52% of the global population. By 2050, more than half of the global population (57%) will live in areas that suffer water scarcity at least one month each year. This estimate by World Water Assessment Programme (2018) may be an underestimation. The water demand, water resources, and water quality forecast by World Water Assessment Programme (2018) depends on many geopolitical factors that are difficult to predict. The decline of water resources and water quality only partially discussed in World Water Assessment Programme (2018), may be much harder to control.

Water quality crisis and pollution-effect: present trends of clean water availability and future expectations

More than 30% of the world largest groundwater systems are now in distress (Richey et al., 2015a; b). The largest groundwater basins are being rapidly depleted. In many places, there is no accurate knowledge about how much water remains in these basins. People are consuming groundwater quickly without knowing when it will run out (Scanlon et al., 2016; Richey et al., 2015a; b). According to Ferguson, McIntosh, Perrone and Jasechko (2018), the world's supply of fresh water may be much more limited than what is thought because unlimited groundwater was assumed. Hence, water crisis challenges more severe than global are expected at regional and local scales (Richey et al., 2015a; b).

At present 12% of the world population drinks water from unimproved and unsafe sources. More than 30% of the world population, or 2.4 billion people, lives without any form of sanitation. Lack of sanitation contributes to water pollution. 90% of sewage in developing countries is discharged into the water untreated (UNICEF, 2016; WHO, 2016). Every year 730 million tons of sewage and other effluents are discharged into the water. Industry discharges of about 300 to 400 megatons of waste are introduced into water every year (WHO/UNICEF, 2016; Connor et al., 2017).

Non-point source pollution from agriculture and urban areas and industry point source pollution contribute to the pollutant load. More than 30% of the global biodiversity has been lost because of the degradation of fresh-water ecosystems due to the pollution of water resources and aquatic ecosystems (United Nations Water, 2015). Wastewater recycling in agriculture, that is important for livelihoods also brings serious health risks (World Water Assessment Programme, 2018). Over the last 3 decades, water pollution has worsened, affecting almost every river in Africa, Asia and Latin America (United Nations Environment Programme (UNEP), 2016).

Water pollution will intensify over the next few decades (IFPRI/Veolia, 2016) and become a serious threat to sustainable development (IFPRI/Veolia, 2016). At present 80% of industrial and municipal wastewaters are released untreated (Sebastian, 1974). Effluents from wastewater are projected to increase because of rapid urbanization and the high cost of wastewater treatment (European Environment Agency, 2015). Nutrient loading is the most dangerous water quality threat, often associated with pathogen loading (UNEP, 2016). Agriculture is the predominant source of nitrogen and a significant source of phosphorus (UNDP, 2016). Current levels of nitrogen and phosphorus pollution from agriculture may already exceed the globally sustainable limits (Rockström et al., 2009). Global fertilizer use is projected to increase from around 90 million tons in 2000 (Winiwarter et al., 2013) to more than 150 million tons by 2050 (Kray, 2012). Intensified biofuel production will lead to high nitrogen fertilizer consumption (Winiwarter, 2013). Nitrogen and phosphorus effluents by 2050 will increase by 180% and 150% respectively (Organisation for Economic Co-operation and Development, 2012). Other chemicals also impact on water quality. Global chemicals used for agriculture currently amount to 2 million tons per year, with herbicides 47.5%, insecticides 29.5%, fungicides 17.5% and other chemicals 5.5% (De et al., 2014).

The list of contaminants is increasing (Sauvé & Desrosiers, 2014) as novel or varied contaminants are used, often suddenly detected at concentrations much higher than of concern. Novel contaminants include pharmaceuticals, hormones, industrial chemicals, personal care products, flame retardants, detergents, perfluorinated compounds, caffeine, fragrances, cyanotoxins, nanomaterials and cleaning agents expected (Sauvé & Desrosiers, 2014). Exposure to pollutants will increase dramatically in low-income and lower-middle income countries (UNEP, 2016). Pollution will be driven by higher population and economic growth in these countries (UNDP, 2016), and the lack of

wastewater treatment (Sebastian, 1974). Pollution will be particularly strong in Africa (UNDP, 2016).

In brief, the demand for water will increase by 2050 but the availability of water will be reduced. Water resources will reduce. Pollution will further reduce the amount of clean fresh water. This aspect is marginally factored in the World Water Assessment Programme (WWDR, 2018)

Breaking the water quality and water security crisis

Many countries are already experiencing water scarcity conditions. Many more countries will face a reduced availability of surface water resources by 2050 (Veldkamp et al., 2017). In the early to mid-2010s, 1.9 billion people, or 27% of the global population, lived in potential severely water-scarce areas (World Water Assessment Programme, 2018). In 2050, this number will increase 42 to 95%, or 2.7 to 3.2 billion people (World Water Assessment Programme, 2018). If monthly, rather than annual, variability is considered, 3.6 billion people worldwide, slightly less than 50% of the global population, presently live in potential water-scarce areas at least 1 month per year. This number will increase from 33 to 58% or 4.8 to 5.7 billion by 2050 (Veldkamp et al., 2017). About 73% of the people affected by water scarcity presently live in Asia (World Water Assessment Programme, 2018). More concrete regulatory measures are needed to tackle the clean water crisis, directly acting on water use and conservation.

The 2018 edition of the United Nations (UN) World Water Development Report (WWDR) and other reports has provided an update on the major obstacles to providing adequate water planning in lieu of sustainable water security. First is the refusal to admit that unbounded growth is unsustainable (Kopnina & Washington, 2016). Overpopulation arguments are portrayed as "anti-poor", "anti-developing country" and "anti-human" (Kopnina & Washington, 2016). Population size as a fundamental driver of scarcity is dubbed as a "faulty notion" (Wada et al., 2016). This denial is partly responsible for lack of

good water planning, supported by overconfidence in nature-based-solutions (NBS). Unfortunately, as the population-growth effect influencing water crisis continues to be denied, most of this population growth is expected in developing countries, first in Africa, and then in Asia, where scarcity of clean water is already a major issue.

Social and socio-economic change: case of energy crisis and energy poverty

Addressing energy poverty is a significant hurdle for many countries in their development journey. Globally, an estimated 1.5 billion individuals lack access to electricity, while about 2.8 billion rely on traditional biomass such as fuelwood, crop residues, and animal dung for their cooking needs (International Energy Agency, 2016). This reliance on traditional biomass is particularly pronounced in rural populations, which constitute the majority in developing nations. The burning of these fuels indoors leads to air pollution, posing a significant health risk given the substantial amount of time people spend inside buildings (Jeuland & Pattanayak, 2012). Despite being a leading contributor to global health decline, indoor air pollution often remains overlooked.

Compounded by the growing number – over a billion people worldwide – that live in slums or informal settlements indoor air pollution – arising from energy poverty – poses a substantial health risk, contributing to over 4 million premature deaths globally annually, with millions' more suffering from serious illnesses (Smith, 1986; Ranabhat et al., 2015). Besides, exposure to high indoor pollution due to excessive biomass fuel burning, unpaved roads, and inadequate waste management may mean a higher risk to catastrophic global health burden underway (Cosgrove, 2018). For instance, residential wood burning activities alone account for approximately 3% of the global disease burden, leading to 1.6 million premature deaths annually, including 0.9 million children under five years of age (World Bank, 2018; World Health Organization, 2023). Hence, increasing and promoting the use of traditional bioenergy already linked to major sustainable development challenges, including access to clean energy

means aggravating environmental, health, and social issues (Mangeni et al., 2023).

At the heart of global resource use are fundamental inequalities; low-income countries consume six times less materials and generate 10 times less climate impacts than those living in high-income countries. However, the use of solid fuels for cooking is common in low-income countries and is deemed hazardous, resulting in around 3.8 million deaths globally annually due to indoor air pollution resulting from incomplete combustion of biomass fuels for cooking (Teune et al., 2020). Millions are affected by respiratory diseases such as lung cancer, asthma, and heart attacks resulting therein in solid-fuel-cooking use (Mulenga & Siziya, 2019). Again, in low-income countries, the majority of people burn biomass fuels in their homes without sufficient ventilation, producing harmful chemicals that significantly impact physical and mental health (Venkataraman et al., 2010), particularly in low-income-developing nations that consume excessive non-renewable resources (Nadimi & Tokimatsu, 2017). This calls for urgent availability of healthier cooking alternatives that currently greatly differs between rural and urban areas (Bantu et al., 2018). Invariably, with healthier cooking solution offered 52% of the world's population living currently in rural areas compared to 14% of urban populations who rely on harmful fuels and technology (Mangeni et al., 2023), healthier sustainable-livelihood may double (Roy, 2024).

Further, traditional solid fuel burning methods introduce contaminants into indoor environments, contributing to indoor air pollution (IAP) and associated health risks (Bantu et al., 2018; Gill-Wiehl et al., 2023). Emphatically, the inadequate burning of solid fuel that result from solid fuel burning use is linked to millions of deaths annually (Kumar et al., 2023). Paradoxically, statistics by Karekezi et al. (2012) show that traditional biomass fuel use only supplies 9% of the world's energy requirements yet, accounts for 55% of wood picking needful to about 40% of the global population (De-Haen & Réquillart, 2014; Bailis et al., 2015; Serrano-Medrano et al., 2019; Haavikko et al., 2022; Lund et al., 2022; Schulze et al., 2022). Due to these significant social changes relative to the environment, between 27 and 34 percent

of the wood fuel harvest in 2009 was unsustainable (Ansah, 2022). In forecast, Duarah et al. (2022) estimate the; quantity of conventional bioenergy consumed today; expected to be consumed in the future vis-a-vis history to be catastrophic to a number of significant obstructions to sustainable development, such as; decreased worldwide access to clean energy and increased; local, national, and international environmental, health, and social challenges.

For, the World Economic Global Forum (2024), this may mean disrupted supply chains for critical goods and resources and increased conflict for current resource-scenery. Besides, extreme weather-environmental risks-exposure significant enough to, cause a global crisis going forward.

On the other hand, upper middle-income countries have more than doubled resource use in the past 50 years due to their own growth in infrastructure and the allocation reallocation of resource cum relocation of resource to intensive processes from high-income countries. At the same time, per capita resource use and related environmental impacts in low-income countries has remained relatively low and almost unchanged since 1995 (UNEP, 2024b).

On the other hand, too, some middle-income contingent parts such as south Asia heavily relies on biomass for household energy consumption, with estimates suggesting it accounted for approximately 80% of usage in 2000 and, currently at around 70% (International Energy Agency, 2016). This bioenergy components includes; biomass fuel (renewable or non-renewable), wood harvests, plus an indefinite quantity of agricultural waste that paradoxically accounts for only between 9 to 15% of their key-energy requirement. More worrisome is that these households burn the; agricultural waste or manure, and; wood fuels in open or rustic stoves while cooking, water heating, and space heating (Nyrud et al., 2008; Johnson & Takama, 2012) all, unsustainable for healthier livelihoods and the environment.

Theoretical framework

Reverse social change: the systems approach and the theory of change

The theory of change is based on systems thinking instead of linear thinking. It builds on an analysis of the success factors behind campaigns to reduce smoking, teenage pregnancy, and drunk driving – all of which involved sustained, strategic, holistic efforts to shift norms and behavior. Ultimately, according to the ideas of the theory of change, the interacting components that can re-engineer, influence and frame existing status quo of a social system are five (Drucker, 1954; Drucker, 2006; Mayne, 2017; Kaplan, 2019).

The first is intellectuals and academia, which shape ideas and frame what a society values, how its challenges are addressed, and what its young people aspire to. Although far removed from the daily lives of the average person, these ideas can ultimately influence how important institutions and actors behave and are viewed. The second, cultural storytelling, is composed of the stories told by news organizations, the entertainment industry, and other media – both high and low – that translate ideas for a wide audience. These influence social conceptions, norms, expectations, and, ultimately, behavior.

The third component is advocacy groups and a wide variety of organizations that do directly influence individual behavior through government policy, community drives, and education, as well as through encouragement and shame. In, changing an existing paradigm or protecting or reinforcing an existing pattern; this component/institution contribute to enhance national development, sustainable development, national economic and developmental goals, national strategies, policies, and planning. While not all activities conducted by these groups involve direct contact with people, many of them do. Hence, contribute to improve education and coherence for global partnership on development and sustainable development. Support the effective public, public-private and civil society partnerships to share and mobilize knowledge, technology, expertise and resources through action-oriented alliance leading to positive reforms in society.

The fourth, authority figures, are the people in a community or network that have a significant influence on what ideas and norms are

adopted. Doctors, lawyers, pastors, financial planners, therapists, teachers, and so forth are sufficiently trusted because of their expertise and status in one area; consequently, their advice and counsel on a wide range of subjects is heeded. The fifth component is interpersonal relationships. Friends and family often exercise the strongest influence on individual decisions. These social networks set examples, standards, and norms that members emulate. The importance of such actors has long been recognized by other elements of the social system.

Social workers and power to influence social change

Analytically, and in lieu of socio-economic and environmental change the, fundamental picture relative to the theory of change postulation is the same: each person and each family – is embedded in a larger social system. Each part of this system works in conjunction with the others in an interactive fashion. Differently, and in further break down of these components; no element stands on its own.

More importantly, in general, the reverse is true of resource exploitation and anthropogenic activities that impede the development and the overall health of the ecosystem. Thus, using the theory of change frame, social workers must enhance simultaneously impact and effectiveness of other parts (particularly individuals and overall society) of the system. In addition, professionally, social workers' interaction must create a network-effect on the households; the more functional effect on the environment and the more supportive overall effect on the ecosystem.

Conclusion

No society has ever remained the same hence, change is inevitable. However, power to influence negative social change and anthropogenic actions is also inherent in action – social work-oriented or otherwise. Anthropogenic activities give rise to climate change in Nigeria, as evidenced by increase in temperature, variable rainfall, rise in sea level and flooding, drought and desertification, land degradation, more frequent extreme weather events and changes, which affect fresh water

resources and loss of biodiversity. These are basic drivers of environment security threats, which result in important ecological and landscape processes that can have irreversible impacts on critical renewable resources, such as water, fiber, food, and clean air. Despite their increasing extent, anthropogenic continue hence; climate change, plastic pollution, global emissions, ecosystem damage, human resource depletion and exposure to humans caused by effluents, emissions, wastes, technological and environmental disaster, among others. Yet untapped are social workers and social movements variables in influencing positive socio-anthropogenic change despite well-known examples of such variables influencing human rights shifts, to name just a few.

Recommendation: bend the trend

Institutionalizing resource governance and defining resource use paths especially the consideration of sustainable resource use in strategies to implement Multilateral Environmental Agreements (MEAs) and improving the ability of countries to benchmark and set targets for resource consumption and productivity are essential in view of abating planetary risk-exposure crisis. Directing finance towards sustainable resource use by reflecting the true costs of resources in the structure of the economy (i.e., subsidies, regulation, taxes, nudges, infrastructure, and planning). Additional recommendations include: channelling private finance towards sustainable resource use and incorporating resource-related risk into Public and Central Bank mandates.

Mainstreaming sustainable consumption options by making sure consumers have the right information, have access to and are able to afford sustainable goods and services. Such measures must be coupled with regulation to disincentivize or ban resource-intensive options (like non-essential single use plastic products).

Making trade an engine of sustainable resource use by creating a level playing field where the true environmental and social costs of goods are reflected in prices by introducing MEAs into trade agreements. Creating circular, resource-efficient and low impact solutions, and business models to include refuse; reduce-eco-design,

reuse, repair, and recycling, as well as supportive regulation and evaluation of existing systems.

Implemented together with social work-social change paradigm these, policies can transform the built environment, mobility, food, and energy systems, resulting in an upsurge in renewable energies and energy efficiency, decarbonization of material production, more walkable and cyclable cities with better public transportation and remote work opportunities, as well as reduced food loss and waste. High- and upper-middle income countries would see a dietary shift away from animal protein and more compact cities, while lower-income economies would experience a rise in resource use to enable dignified living.

Reference

Aduge-Ani, D (2013). *Nigeria: Welcome to Abuja city slums and ghettos*. Accessed from: https://allafrica.com/stories/201311110097.html

Akintunde, O. (2008, January 18). *126m Nigerians Poor – World Bank*. Nigeria: Daily Independent.

Altieri, D. (2016). *The Effects of Overpopulation on Water Resources and Water Security*. Accessed from: http://fubini.swarthmore.edu/~ENVS2/dan/Essay4.html

Amaeshi, K. M., Adi, B. C., Ogbechie, C., and Amao, O. O. (2006). Corporate Social Responsibility in Nigeria: Western Mimicry or Indigenous Influences? *The Journal of Corporate Citizenship*, 24, 83-100.

Amao, O. (2009). *Explanatory notes on CSR Bill*. Accessed from: http://www.femiamao.com

Andersen, I. (2024). *Reducing the resource intensity of mobility, housing, food and energy systems is the only way we can achieve the Sustainable Development Goals and ultimately a just and liveable planet for all*. Accessed from: https://www.unep.org

Ansah, P. K. (2022). The Impact of Charcoal Production on the forest of Sub-Saharan Africa: A theoretical investigation. *Journal of Sustainable Development*, 15(*2*), 1-14.

Bailis, R., Drigo, R., Ghilardi, A., & Masera, O. (2015). The carbon footprint of traditional woodfuels. *Nature Climate Change*, 5(*3*), 266–272.

Bantu, A. A., Nuwagaba, G., Kizza, S., & Turinayo, Y. K. (2018). Design of an improved cooking stove using high density heated rocks and heat retaining techniques. *Hindawi Journal of Renewable Energy*, 1, e9620103.

Barkemeyer, R. (2009). Beyond compliance – below expectations? CSR in context of international development. *European Business Ethics Review*, 18(*3*), 273-289.

Bräutigam, D. (2008). Taxation and Governance in Africa. *Development Policy Outlook*, 1, e27798. http://www.aei.org

Burek, P., Satoh, Y., Fischer, G., Kahil, M. T., Scherzer, A., Tramberend, S., Nava, L. F., Wada, Y., Eisner, S., Flörke, M., Hanasaki, N., Magnusziewski, P., Cosgrove, W., and Wiberg, D. (2016). *Water Futures and Solution: Fast Track Initiative (Final Report). IIASA Working Paper*. Laxenburg, Austria: International Institute for Applied Systems Analysis.

Connor, R., Ortigara, C. R. A., Koncagül, E., Uhlenbrook, S. (2017). The United Nations world water development report 2017. New York, United States: United Nations Educational, Scientific and Cultural Organization

Cosgrove, C. (2018). Clean Cookstoves: An Urgent Necessity. *Croatian Journal of Forest Engineering*, 1(*1*), 5-16

De, A., Bose, R., Kumar, A. & Mozumdar, S. (2014). Targeted Delivery of Pesticides Using Biodegradable Polymeric Nanoparticles. India: Springer Briefs in Molecular Science

De-Haen, H., & Réquillart, V. (2014). Linkages between sustainable consumption and sustainable production: Some suggestions for foresight work. *Food Security*, 6, 87–100.

Drucker, P. F. (1954). *The Practice of Management*. UK: Harper Business

Drucker, P. F. (2006). *The Practice of Management*. UK: Harper Business

Duarah, P., Haldar, D., Patel, A. K., Dong, C.-D., Singhania, R. R., & Purkait, M. K. (2022). A review on global perspectives of sustainable development in bioenergy generation. *Bioresource Technology*, 348, 1267-91.

Dunfey, T. S. (2023, Aug 14). *What is social change and why should we care?* UK: Southern New Hampshire University (SNHU).

Ebigbo, P. O. (2008). Appraising the Impact of Economic Reform Programme on Micro, Small and Medium Scale Enterprises. *A Paper delivered at the 19th Enugu International Trade Fair Colloquium, 2008, April 15*.

Eneh, O. C. (2011d). Crippling poverty amidst corporate social actions: A critique of peripheral corporate community involvement in the Niger Delta region of Nigeria. *Asian Journal of Rural Development*, 1(*1*), 1-20.

Eneh, O. C. (2011e). Nigeria's Vision 20:2020 – Issues, challenges and implications for development management. *Asian Journal of Rural Development*, 1(*1*), 21-40.

Eneh, O. C. (2011f). *Development Scientology: Science, Technology, Energy, Natural Resources and Development – Nigeria's Perspective*. Enugu: WIPRO International.

Ercilla-Montserrat, M., Muñoz, P., Montero, J. I., Gabarrell, X., & Rieradevall, J. (2018). A study on air quality and heavy metals content of urban food produced in a Mediterranean city (Barcelona). *Journal of Cleaner Production*, 195, 385–395.

European Environment Agency (2015). *Increasing Environmental Pollution (GMT 10)*. UK: EEA

Ezeh, A., Oyebode, O., Satterthwaite, D., Chen, Y. F., Ndugwa, R., Sartori, J., Mberu, B., Melendez-Torres, G. J., Haregu, T., Watson, S. I., Caiaffa, W., Capon, A., Lilford, R. J. (2017). The history, geography and sociology of slums and the health problems of people who live in slums. *The Lancet*, 389(*10068*), 547–558.

Famakinwa, S. (2006, September 27). *Nigeria Falls in Competitiveness Ranking*. Nigeria: ThisDay Newspaper

Ferguson, G., McIntosh, J. C., Perrone, D. & Jasechko, S. (2018). Competition for shrinking window of low salinity groundwater. *Environ. Res. Lett.*, 13, e114013.

Firdaus, G. (2012). Urbanization, emerging slums and increasing health problems: a challenge before the nation: An empirical study with reference to state of Uttar Pradesh in India. *Journal of Environmental Research and Management*, 3(*9*), 146–152.

Gill-Wiehl, A., Sievers, S., Katikiro, R., & Kammen, D. M. (2023). Evaluation of the preference for and viability of clean cookstove adoption in rural Tanzania. *Energy, Sustainability and Society*, 13(*1*), 42-59.

Gyamfi, C. C. (2006, November 14). *Minister Bemoans Youth Unemployment*. Nigeria: The Guardian Newspaper

Haavikko, H., Kärhä, K., Poikela, A., Korvenranta, M., & Palander, T. (2022). Fuel consumption, greenhouse gas emissions, and energy efficiency of wood-harvesting operations: A case study of Stora Enso in Finland. *Journal for Theory and Application of Forestry Engineering*, 43(1), 79–97.

IFPRI (International Food Policy Research Institute)/Veolia. (2016). *The Murky Future of Global Water Quality: New Global Study Projects Rapid Deterioration in Water Quality*. Washington, D.C., United States: IFPRI/Veolia.

International Energy Agency (2016). *Worldwide trends in energy use and efficiency*. Accessed from: https://www.iea.org

Jeuland, M. A., & Pattanayak, S. K. (2012). Benefits and costs of improved cookstoves: assessing the implications of variability in health, forest and climate impacts. *PloS One*, 7(*2*), e30338.

Jhingan, M. L. (2007). *The Economics of Development and Planning*, 39ed. Delhi: Vrinda Publications (P) Ltd.

Johnson, F. X., & Takama, T. (2012). Economics of modern and traditional bioenergy in African households: Consumer choices for cook stoves. In: R. Janssen and D. Rutz (eds.), *Bioenergy for Sustainable Development in Africa*. US: Springer Science Business Media B.V. Press.

Kaplan, S. D. (2019). Reversing social disintegration. *National Affairs*, 60, 1-20

Karekezi, S., Lata, K., & Coelho, S. T. (2012). Traditional biomass energy: Improving its use and moving to modern energy use. In: S. Karekezi, K. Lata, S. T. Coelho (eds.), *Renewable energy*. US: Routledge

Karim, M. R (2012). Children suffering malnutrition in a slum. *A paper presented at the Wikinut-guides-activism conference Ukraine, January 11.*

Kepner, W.G. (2006). Introduction: desertification and security; Perspectives for the Mediterranean region. In: W.G. Kepner, J.L. Rubio, D.A. Mouat, F. Pedrazzini (eds), *Desertification in the Mediterranean Region. A Security Issue*. Dordrecht: Springer.

Kopnina, H., & Washington, H. (2016). Discussing why population growth is still ignored or denied. *Chin. J. Popul. Resour. Environ.*, 14, 133–143

Kray, H. A. (2012). *Farming for the Future. The Environmental Sustainability of Agriculture in a Changing World*. Washington, D.C., United States: World Bank

Kumar, P., Singh, A., Arora, T., Singh, S., & Singh, R. (2023). Critical review on emerging health effects associated with the indoor air quality and its sustainable management. *Science of The Total Environment*, 872, 162163.

Lilford, R. J., Oyebode, O., Satterthwaite, D., Melendez-Torres, G. J., Chen, Y. F., Mberu, B., Watson, S. I., Sartori, J., Ndugwa, R., Caiaffa, W., Haregu, T., Capon, A., Saith, R., Ezeh, A. (2017). Improving the health and welfare of people who live in slums. *The Lancet*, 389(*10068*), 559–570.

Lund, H., Skov, I. R., Thellufsen, J. Z., Sorknæs, P., Korberg, A. D., Chang, M., Mathiesen, B. V, & Kany, M. S. (2022). The role of sustainable bioenergy in a fully decarbonised society. *Renewable Energy*, 196, 195–203.

Mangeni, J. N., Menya, D., Mwitari, J., Shupler, M., de Cuevas, R., Sang, E., Anabwani, E., Sutton, N., Nix, E., & Ronzi, S. (2023).

Household cooking fuel choice and associated factors in a rural and peri-urban community in Western Kenya. *Energy & Environment*, 1, 2-32.

Mayne, J. (2017). Theory of change analysis: Building robust theories of change. *Canadian Journal of Program Evaluation*, 32(*2*), 155–173. doi:10.3138/cjpe.31122.

Mekonnen, M. M. & Hoekstra, A. Y. (2016). Four billion people facing severe water scarcity. *Sci. Adv.*, 2, e1500323

Miles, M. P., Munilla, L. S., and Darroch, J. (2006). The Role of Strategic Conversations with Stakeholders in the Formation of Corporate Social Responsibility Strategy. *Journal of Business Ethics,* 69(*2*), 195-207

Mulenga, D., & Siziya, S. (2019). Indoor Air Pollution Related Respiratory Ill Health, a Sequel of Biomass Use. *SciMedicine Journal*, 1, 30–37.

Nadimi, R., & Tokimatsu, K. (2017). Analyzing of Renewable and Non-Renewable Energy consumption via Bayesian Inference. *Energy Procedia*, 142, 2773–2778.

Nwosu, I. E. (2008). Building Conducive Policy Environment for Planning and Executing Advocacy, IEC and BCC Projects/Programmes on Adolescent Reproductive Health in Nigeria. *The Nigerian Journal of Development Studies*, 6(*2*), 1-20.

Nyrud, A. Q., Roos, A., & Sande, J. B. (2008). Residential bioenergy heating: A study of consumer perceptions of improved woodstoves. *Energy Policy*, 36(*8*), 3169–3176.

Okello, B. T., Nicolas, G., Nina, W., and Marco, A. (2015). Impact of Population Growth and Climate Change on the Freshwater Resources of Lamu Island, Kenya. *Water*, *7*(*3*), 1264-1290

Okonjo-Iweala, N., and Osafo-Kwaako, P. (2007). *Nigeria's Economic Reforms: Progress and Challenges*. Accessed from: http://www.brookings.edu

Okoye, U. O. (2019). Health care social work in Nigeria. In: R. Winnett, R. Furman, D. Epps, & G. Lamphear (Eds.), *Health Care Social Work: A Global Perspective*. New York: Oxford University Press

Onah, F. O. (2006). *Managing Public Programmes and Projects*. Nsukka: Great AP Express Publishers Limited

Onodugo, V. A., Ugwuonah, G. E., and Ebinne, E. S. (2010). *Social Science Research: Principles, Methods and Application.* Enugu: El 'Demark (Publishers)

Onyekakeyah, L. (2008, August 19). *Vision 2020 and Seven-Point Agenda: Any Connection?* Nigeria: Guardian

Organisation for Economic Co-operation and Development (OECD) (2012). OECD Environmental Outlook to 2050. Paris, France: Organisation for Economic Co-operation and Development

Philippe, L. B. (2006). *Fuelling War: Natural Resources and Armed Conflicts (Aldelphi Paper 373)*. US: IISS & Routledge

PreventionWeb (2021). *Climate change in Nigeria: Impacts and responses*. Accessed from: www.preventionweb.net.

Ranabhat, C. L., Kim, C. B., Kim, C. S., Jha, N., Deepak, K., & Connel, F. A. (2015). Consequence of indoor air pollution in rural area of Nepal: A simplified measurement approach. *Frontiers in Public Health*, 3, 5-21.

Richey, A. S., Thomas, B. F., Lo, M. H., Famiglietti, J. S., Swenson, S., Rodell, M. (2015b). Uncertainty in global groundwater storage estimates in a total groundwater stress framework. *Water Resour. Res*., 51, 5198–5216.

Richey, A. S., Thomas, B. F., Lo, M. H., Reager, J. T., Famiglietti, J. S., Voss, K., Swenson, S., Rodell, M. (2015a). Quantifying renewable groundwater stress with GRACE. *Water Resour. Res.*, *51*, 5217–5238.

Rockström, J., Steffen, W., Noone, K. J., Persson, Å. (2009). A safe operating space for humanity. *Nature*, 461, 472–475.

Roy, K. (2024). Cooking with Modern Energy in Rural Households of India: A Cost–Benefit Analysis. *The INSEE Ecology, Economy and Society Journal*, 7(*1*), 2-13.

Sauvé, S., & Desrosiers, M. A. (2014). Review of what is an emerging contaminant. *Chem. Cent. J.*, 8, 15-21

Scanlon, B. R., Zhang, Z., Save, H., Wiese, D. N. (2016). Global evaluation of new GRACE mascon products for hydrologic applications. *Water Resour. Res*., 52, 9412–9429.

Schulze, E. D., Bouriaud, O., Irslinger, R., & Valentini, R. (2022). The role of wood harvest from sustainably managed forests in the carbon cycle. *Annals of Forest Science*, 79(*1*), 17-23.

Sebastian, F. P. (1974). Purified Wastewater: The Untapped Water Resource. *J. Water Pollut. Control Fed.*, 46, 239–246.

Serrano-Medrano, M., Ghilardi, A., & Masera, O. (2019). Fuelwood use patterns in Rural Mexico: A critique to the conventional energy transition model. *Historia Agraria*, 77, 167-198.

Smith, K. R. (1986). Biomass combustion and indoor air pollution: The bright and dark sides of small is beautiful. *Environmental Management*, 10, 61–74.

Sobowale, D. (2006, October 1). *The Poverty Question: A Broad Perspective*. Nigeria: Sunday Vanguard

Teune, B., Ha, H. T., Salinas, D., McLean, K., & Bailis, R. (2020). Low-cost interventions to reduce emissions and fuel consumption in open wood fires in rural communities. *Energy for Sustainable Development*, 58, 119–128.

The World Global Forum (2024). World Economic Forum Annual Meeting. Accessed from: https://www.weforum.org

The World Global Forum (2024). World Economic Forum Annual Meeting. Accessed from: https://www.weforum.org

Todaro, M. P., and Smith, S. C. (2006). *Economic Development*, 9 ed. England: Pearson Education Limited

Turyasingura, B. (2022). Re-thinking climate change and water resources in Africa: Opportunities, challenges, consequences, and adaptive solutions for water availability. *A presentation at UNFCCC COPE 27 Conference, Arab Republic of Egypt, November 2*.

UNICEF (2016). *2015 Progress on Sanitation and Drinking Water*. New York: UNICEF.

United Nations Environment Assembly (2024). *Outcomes of UNEA-6*. Accessed from: https://www.unep.org

United Nations Environment Programme (UNEP) (2016). *A Snapshot of the World's Water Quality: Towards a Global Assessment*. Nairobi: UNEP.

United Nations Environmental Programme (UNEP) (2024a). Global Resources Outlook 2024. Accessed from: https://www.unep.org

United Nations Environmental Programme (UNEP) (2024b). Rich countries use six times more resources, generate 10 times the climate impacts than low-income ones. Accessed from: https://www.unep.org

United Nations Water (2015). *Wastewater Management – A UN-Water Analytical Brief 1–52*. Geneva, Switzerland: World Meteorological Organization.

Veldkamp, T. I. E., Wada, Y., Aerts, J. C. J. H., Döll, P., Gosling, S. N., Liu, J., Masaki, Y., Oki, T., Ostberg, S., Pokhrel, Y., Satoh, Y., Kim, H., Ward, P. J. (2017). Water scarcity hotspots travel downstream due to human interventions in the 20th and 21st century. *Nat. Commun.*, 8, 15697

Venkataraman, C., Sagar, A. D., Habib, G., Lam, N., & Smith, K. R. (2010). The Indian national initiative for advanced biomass cookstoves: The benefits of clean combustion. *Energy Sustain. Dev.*, 14, 63–72.

Wada, Y., Flörke, M., Hanasaki, N., Eisner, S., Fischer, G., Tramberend, S., Satoh, Y., van Vliet, M. T. H., Yillia, P., Ringler, C., Burek, P., and Wiberg, D. (2016). Modelling global water use for the 21st century: The Water Futures and Solutions (WFaS) initiative and its approaches. *Geosci. Model Dev.*, 9, 175–222

Wassie, Y. T., & Adaramola, M. S. (2021). Analysis of potential fuel savings, economic and environmental effects of improved biomass cookstoves in rural Ethiopia. *Journal of Cleaner Production*, 280, 12470-91.

WHO (2016). *2015 Update and MDG Assessment*. Geneva, Switzerland: WHO. (JM Program,

WHO/UNICEF (2016). *Joint Water Supply and Sanitation Monitoring Programme*. New York: WHO

Winiwarter, W., Erisman, J. W., Galloway, J. N., Klimont, Z., & Sutton, M. A. (2013). Estimating environmentally relevant fixed nitrogen demand in the 21st century. *Clim. Change*, 120, 889–901

World Bank (2018). *Bangladesh: Healthier homes through improved cookstoves*. Washington, D.C., United States: World Bank

World Health Organization (2021a). *World health report*. Accessed from: https://www.who.int/whr/media_centre/factsheet4/en/.

World Health Organization. (2023). Household air pollution and health. Geneva: WHO

World Water Assessment Programme (2018). *The United Nations World Water Development Report 2018*. United Nations, New York: United States Educational, Scientific and Cultural Organization

Yardley, J. (2011, December 28). *In one slum, misery, work, politics and hope*. US: New York Times.