

International Trade and Sustainable Development Goals (SDGs) of Economies : A Way Forward

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The research paper studies the relationships and inter-linkages existing between international trade and Sustainable Development Goals(SDGs) adopted by the United Nations, of various economies. It is observed that in order to fully implement the SDGs goals and their indicators adopted by the UN, least developing countries and particularly, the small island developing states need to adjust their economies to adapt to achieving the SDGs by the turn of 2030 as slated by the UN. The paper also dwells into the issues of poverty, inclusiveness and equality, implementation of Addis Ababa Action Agenda on SDGs, National Level Efforts undertaken for Development of International Community, discusses the recommendations of the 2017 Task Force on SDGs, issues on financing investment and social protection, domestic and international finance, international development cooperation, role of international trade in achieving SDGs and the 2030 Agenda, SDGs and their indicators, financing for development and small island developing states, SIDS and economic growth, SIDS and Human Development, SIDS, international climate and environmental funds & SIDS and remittances and SIDS and Financing for Shocks. Certain statistical tools such as Gamma Distribution, Normal Distribution and Pearson Correlation Coefficient have been estimated to analyze the economic relationships existing among the variables like SDGs & SIDS and their indicators such as human development, financing for development, environmental funds, financing for shocks etc., The paper analyzes that there are wide variations in the data sets and their statistical and probabilistic distribution functions with respect to these variables. Hence, it may not be possible to assign systematic economic relationships and inter-linkages among the parameters/ economic variables, which if systematic relationships could have been established, would have led to achieving the SDGs among the macro-variables for the various economies thereby leading to achieving the target set by UN by the turn of 2030.

Keywords: Sustainable Development Goals, Sustainable 2030 Agenda, SIDS, International Climate, Environmental Funds, Social Protection, Development Financing

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Introduction

Major international conferences and summits on financing for development, sustainable development, and climate change have defined a new sustainable development agenda for the next 15 years. At all levels, from global to local, the focus would be on implementing this ambitious agenda of Global Sustainable Development adopted by the UN. The mandate emerges from the Rio+20 Conference to contribute to strengthening the science-policy interface for sustainable development in the context of the high-level political forum on sustainable development (HLPF). Given the adoption of the 2030 Agenda for Sustainable Development with its sustainable development goals (SDGs), it adopts the SDGs as its scope. The endeavour is to present a range of scientific perspectives and to be policy-relevant but not policy-prescriptive. It explores possible approaches and vantage points from which to examine the science-policy interface, as well as scientific approaches that can inform policies building upon integration and inter-linkages across sustainable development goals, sectors, and issues. The SDGs focus on 'ensuring that no one is left behind'. The paper aims to bring together information and cutting-edge knowledge from a wide range of sustainability science disciplines across all regions of the world. The research paper aims to provide a reference frame for exploring the implications of the principle of "leaving no one behind" for the operationalization of the SDGs from a science-policy perspective. The paper presents and showcases how those left behind are defined by different disciplines and development practitioners. It points to existing mechanisms for targeting and reviews of the effectiveness of development interventions in targeting and reaching those left behind, and existing scientific reviews of how closely aligned they are with the objective of leaving no one behind and with the aspiration to reach the furthest behind first.

The paper examines inter-linkages between infrastructure, inequality and resilience. Based on a consultation of scientists from different disciplines, it highlights important channels of interconnection among these areas and distils the results of scientific analyses of the synergies and trade-offs among them. The paper also aims to strengthen science-policy interface by showing policymakers how key inter-linkages are analyzed by the scientific community, while providing the scientific community with some key policy questions and highlighting areas that may need further research. The paper provides an overview of perspectives on technology and the sustainable development goals. It aims to show-case promising actions and policy elements for fully leveraging technology for the achievement of the SDGs, also paying attention to the imperative to leave no one behind. It provides an overview of a range of technologies that contributing scientists identified as the most crucial in the implementation of the SDGs from now to 2030. The paper focuses on institutions as essential components and enablers of inclusive societies. The paper looks at these institutions both in terms of how inclusive they are, and how important they are in supporting inclusive outcomes. The HLPF is mandated to ensure appropriate consideration of new and emerging sustainable development challenges. The paper provides an overview of existing approaches and processes to identify emerging issues for sustainable development. It introduces

potential guiding criteria that could be used among a multitude of emerging issues identified by different processes. The paper also presents the main insights from an expert consultation process whose aim was to test the methodology proposed for identification of emerging issues and examine how best these issues could be brought to the attention of policy-makers. The objective of achieving SDGs is to ensure that no one is left behind for Sustainable Development and its implementation. It emphasizes that goals and targets should be met for all nations and people and for all segments of society; and highlights the endeavour to reach the furthest behind first. As such, the pledge to leave no one behind relates to the Agenda in its entirety.

Leaving no One Behind, Poverty, Inclusiveness, Equality and SDGs

The pledge to leave no one behind relates closely to three important dimensions of the 2030 Agenda: poverty, inclusiveness and inequality. Poverty in its various dimensions remains at the center of the New Agenda, as it used to be at the center of the Millennium Development Goals (MDGs) and was identified as one of the three overarching objectives of sustainable development. In the eyes of the lay person, poverty is an obvious way to identify those left behind. Poverty measures have also commonly been used to identify those left behind in development practice. Inclusiveness (social, economic, political and cultural) refers to the notion of empowerment and the principle of non-discrimination. It refers to the need to include everyone in societal processes, and conveys the notion that people should not only be allowed to thrive, but should have a voice and effective opportunities to shape the course of development. SDG 5, SDG 10 and SDG 16, inter alia, have very strong connections to inclusiveness and empowerment. The cross-cutting commitment to disaggregate data to monitor the SDGs also reflects the notion of inclusiveness. The concept of equality or inequality is also prominent in the 2030 Agenda. It has a standalone goal, SDG 10, which aims to reduce inequalities within and among countries, and is also directly reflected in goals and targets in the 2030 SDG Agenda, including in the goals for health, education, gender and others. At the national level, targets explicitly aiming at 'leaving no one behind' are multiple. Many targets aim to reduce inequalities of outcome. This includes: ensuring universal and equal access to basic services, ensuring access to food for all, and end malnutrition, achieving and sustaining income growth of the bottom 40 per cent of the population at a rate higher than the national average and doubling agricultural productivity of small-scale food producers. Targets that detail measures in support of these objectives include putting in place social protection systems and policies, building the resilience of the poor and vulnerable, access to employment and expanding infrastructure with a focus on affordable and equitable access for all. Other targets focus on ending discrimination which includes empowering and promoting the social, economic and political inclusion of all, ending all forms of discrimination against women and girls, eliminating violence against women and girls, ending abuse, exploitation, trafficking and all forms of violence against and torture of children, recognizing unpaid care and domestic work, equal access to technical, vocational and tertiary education and equal pay for work of equal value. Targets that detail measures

in support of these include eliminating discriminatory laws, policies and practices and promoting and enforcing appropriate legislation, policies and action in this regard, promoting the rule of law and ensure equal access to justice for all, protecting fundamental freedom, eradicating forced labour, including the worst forms of child labour and human trafficking, protecting labour rights and providing legal identity for all including birth registration.

National Level Efforts Undertaken for Development of International Community

The following efforts have been undertaken at the National Level for the development of the International Community to achieve SDG implementation and sustainable development viz;

- Efforts are underway on many levels to develop and strengthen financing frameworks to support SDG implementation and sustainable development.
- There are calls for national strategies and plans to guide implementation efforts in almost all action areas, including for example medium-term revenue strategies, financial inclusion strategies and infrastructure plans, development cooperation strategies, science, technology and innovation strategies and many others.
- Recommendation of the Task Force to ultimately bring together into a cohesive framework.
- In each case, stakeholders with diverse interests need to arrive at a common understanding, priorities have to be set within budget constraints and technically complex policy issues have to be tackled, often despite limited capacities.
- As challenges invariably differ by country contexts and evolve over time, these strategies also have to be country-specific and responsive to changing circumstances.
- Finally, they must be coherent with the broader overall sustainable development strategy. Integrated national financing frameworks that take into consideration all financing sources and policies, can provide this coherence.
- The Addis Agenda that “cohesive nationally owned sustainable development strategies, supported by integrated national financing frameworks need to be followed for SDG implementation and sustainable development.
- These strategies and frameworks also serve as guideposts for national priorities and SDG-related opportunities to investors and development partners. Developing and implementing them is one of the central challenges that countries face as they embark on achieving the SDGs.

Though the task is complex, UNDP has undertaken Development Finance Assessments that comprehensively scan a country’s financing landscape both flows and policies and this methodology is currently being refined by UN. Such assessments can be a

baseline for integrated national financing frameworks. Work is also ongoing on many of the action area-specific plans and strategies, including for example on financial market development and how to incentivize long-term investment, alignment with sustainability and inclusiveness. In the upcoming year i.e. 2017/18 work cycle, the Task Force members would continue analytical work in this area, with a view to share emerging lessons and support Member States' efforts to strengthen these frameworks.

Success of the 2030 Agenda will rely on changing the current growth dynamic. International cooperation that supports policies to increase public and private investment in sustainable development and generate employment, while protecting the vulnerable against crises and shocks, would help achieve the SDGs while stimulating global growth and reducing the risk of future crises thereby creating a virtuous cycle.

Financing Investment and Social Protection

The Addis Agenda emphasizes the need to increase long-term investments, including in infrastructure, where investment needs are largest. It explores when and how public and private investments and blended finance can be mobilized for quality investments aligned with sustainable development, noting the role of development banks and specific challenges in the least developed countries (LDCs). Long-term and high quality investments will sustainably increase productivity and economic growth and enhance households' incomes and resilience to shocks. However, measures to directly ameliorate the living conditions of the poor are also needed, particularly in light of their vulnerability to economic downturns, natural disasters and humanitarian crises. National, regional and multilateral development banks can play an important role in this regard, by channeling savings into development investments, by mobilizing private capital for specific projects, by improving capacity and by promoting best practices aligned with sustainable development.

International Trade as an Engine for Development

International trade is an engine for inclusive economic growth and poverty reduction, and is a means of implementation for the sustainable development goals. It has been a significant source of public and private finance in developing countries. The decades before the 2008 global financial and economic financial crisis saw significant expansion in world trade. During this period, rapid trade growth contributed to a steady improvement in many countries' income generating capacity, which helped reduce extreme poverty. More recently, however, trade growth has slowed significantly. Faced with the current challenging scenario in international trade, the trade-related commitments in the Addis Agenda which include measures to strengthen the multilateral trading system, facilitate international trade, and promote policy coherence in trade take on new importance. It is important to recognize that trade has distributional effects. To contribute to the Sustainable Development Goals (SDGs), trade must become more inclusive and beneficial to all, and create wealth and decent jobs, especially for the poor. Governments should work together to resist inward-looking and protectionist pressures, and to ensure that the benefits of trade are spread more widely and

equitably. International institutions should work with Governments to address any distributional effects of international trade and trade agreements and promote world trade growth that is consistent with the SDGs. Increased uncertainty in world trade disproportionately harms LDCs and small economies. National Governments should work towards improving market access conditions for the exports of LDCs, LLDCs and SIDS by reducing the trade costs facing them and simplifying and harmonizing preferential rules of origin. Governments should reduce the potential for regulatory measures in the areas of food, health, environment, and labour policies to inadvertently act as non-tariff barriers to exports from developing countries. The United Nations development system is moving to implement a more coherent approach aligned with sustainable development, as are other regional and global organizations, though efforts are more advanced in some institutions than others. All regional and global organizations, especially those with norm-setting functions, should continue efforts to align their strategies, policies, and practices with the Sustainable Development Goals. Finally, governance of global systems should reflect changes in the global economy and be responsive to the risks faced in all parts of the world. The Member States should commit to increasing the voice of developing countries in international economic-decision making and norm-setting processes and other main international regulatory standard-setting bodies. The existing regular reviews of governance at the World Bank and IMF are meant to address this. Other international organizations are also implementing reforms, though progress is uneven. Periodic processes to examine governance structures at global and regional organizations, with the goal of strengthening the voice of developing countries, would help meet commitments.

Science, Technology, Innovation and Capacity Building

Technology and innovation are at the heart of economic, social and environmental development. Over the past several decades there has been important progress in access to many technologies, particularly in information and communication technology. Access remains uneven within and between countries, with the greatest growth in technology investment occurring mainly in developed regions and select developing countries. Substantial divides in access rates to certain technologies, for example the internet, persist between men and women as well as between urban and rural areas. Knowledge and technology transfer from developed to developing countries is a necessary part of ensuring access to technology, since many technologies are initially developed in industrialized countries. Technology transfer involves more than the importation of hardware. It involves the complex process of sharing knowledge and adapting technologies to meet local conditions. The STI performance of a country, as well as its economic and social impact, are affected by the quality and level of interactions and flows of knowledge between agents in the innovation system such as firms, universities, research centers, public agencies and intermediate organizations. These interactions are enabled by infrastructure, market forces and public policies. The systemic nature of the innovation process underlines the need to incorporate scientific and technological knowledge into national development strategies and plans

in order to make effective use of innovation. Capacity building is an integral part of the global partnership for sustainable development.

Preamble to Sustainable Development Goals 2030 Agenda

The preamble to the 2030 Agenda describes the areas of critical importance for humanity and the planet in the coming 15 years as:

- People to end poverty and hunger and to ensure that all human beings can fulfill their potential in dignity and equality and in a healthy environment;
- Planet to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations;
- Prosperity to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature;
- Peace to foster peaceful, just and inclusive societies which are free from fear and violence (there can be no sustainable development without peace and no peace without sustainable development);
- Partnership to mobilize the means required to implement the SDG through a revitalized 'Global Partnership for Sustainable Development', based on a spirit of strengthened global solidarity, focused in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people.

Sustainable Development Goals (SDGs) and Their Indicators

Goal 1, Targets and Indicators

- End poverty in all its forms everywhere
- By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day
- Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
- Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable
- Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable

- By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters
- Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)

Goal 2, Targets and Indicators

- End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round

Prevalence of Undernourishment

By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons

Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age

Prevalence of malnutrition (weight for height $>+2$ or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)

By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed

Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities

Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction

Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

The agriculture orientation index for government expenditures

Total official flows (official development assistance plus other official flows) to the agriculture sector

Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round

Agricultural export subsidies

Goal 3, Targets and Indicators

- Ensure healthy lives and promote well-being for all at all ages
- By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births
- Maternal mortality ratio
- Proportion of births attended by skilled health personnel
- By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births
- Under-five mortality rate
- Neonatal mortality rate
- By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases
- Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations
- Tuberculosis incidence per 100,000 population
- Malaria incidence per 1,000 population
- Number of people requiring interventions against neglected tropical diseases
- By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being
- Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease
- Suicide mortality rate
- Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
- Harmful use of alcohol, defined according to the national context as alcohol per

capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol

- By 2020, halve the number of global deaths and injuries from road traffic accidents
- Death rate due to road traffic injuries
- By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
- Proportion of women of reproductive age (aged 15-49 years) who have their need for family planning satisfied with modern methods
- Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group
- By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
- Mortality rate attributed to household and ambient air pollution
- Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)
- Mortality rate attributed to unintentional poisonings
- Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all
- Total net official development assistance to medical research and basic health sectors

Goal 4, Targets and Indicators

- Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education
- Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex
- Participation rate in organized learning (one year before the official primary entry age), by sex

- By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations
- Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated
- By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries
- Volume of official development assistance flows for scholarships by sector and type of study

Goal 5, Targets and Indicators

- By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States
- Proportion of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country
- Achieve gender equality and empower all women and girls
- Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation
- Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age
- Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation
- Proportion of women aged 20-24 years who were married or in a union before age 15 and before age 18
- Proportion of girls and women aged 15-49 years who have undergone female genital mutilation/cutting, by age
- Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life
- Proportion of seats held by (a) women in national parliaments and (b) local governments

- Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences
- Proportion of women aged 15-49 years who make their own informed decisions regarding sexual relations, contraceptive use and reproductive health care

Goal 6, Targets and Indicators

- Ensure availability and sustainable management of water and sanitation for all
- By 2030, achieve universal and equitable access to safe and affordable drinking water for all
- Proportion of population using safely managed drinking water services
- By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
- Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
- By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
- Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
- By 2030, implement integrated water resources management at all levels, including through trans-boundary cooperation as appropriate
- Degree of integrated water resources management implementation (0-100)
- By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies
- Amount of water and sanitation-related official development assistance that is part of a government-coordinated spending plan
- Support and strengthen the participation of local communities in improving water and sanitation management
- Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

Goal 7, Targets and Indicators

- Ensure access to affordable, reliable, sustainable and modern energy for all
- By 2030, ensure universal access to affordable, reliable and modern energy services
- Proportion of population with access to electricity
- Proportion of population with primary reliance on clean fuels and technology
- By 2030, increase substantially the share of renewable energy in the global energy mix
- Renewable energy share in the total final energy consumption
- By 2030, double the global rate of improvement in energy efficiency
- Energy intensity measured in terms of primary energy and gross domestic product (GDP)

Goal 8, Targets and Indicators

- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all Total
- Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries
- Annual growth rate of real GDP per capita
- Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour intensive sectors
- Annual growth rate of real GDP per employed person
- By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
- Unemployment rate, by sex, age and persons with disabilities
- Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms
- Proportion and number of children aged 5-17 years engaged in child labour, by sex and age
- Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all

- Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider
- Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries.
- Aid for trade commitments and disbursements

Goal 9, Targets and Indicators

- Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all Passenger and freight volumes, by mode of transport
- Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries
- Manufacturing value added as a proportion of GDP and per capita
- By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities
- CO₂ emission per unit of value added
- Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending
- Research and development (R&D) expenditure as a proportion of GDP
- Researchers (in full-time equivalent) per million inhabitants
- Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States
- Total official international support (official development assistance plus other official flows) to infrastructure
- Significantly increase access to information and communications technology and

strive to provide universal and affordable access to the Internet in least developed countries by 2020

- Proportion of population covered by a mobile network, by technology

Goal 10, Targets and Indicators

- Reduce inequality within and among countries
- Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions
- Proportion of members and voting rights of developing countries in international organizations
- Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements
- Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff
- Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes
- Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)
- By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent
- Remittance costs as a proportion of the amount remitted

Goal 11, Targets and Indicators

- Make cities and human settlements inclusive, safe, resilient and sustainable
- By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
- Proportion of urban population living in slums, informal settlements or inadequate housing
- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
- Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

- Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)

Goal 12, Targets and Indicators

- Ensure sustainable consumption and production patterns
- By 2030, achieve the sustainable management and efficient use of natural resources
- Material footprint, material footprint per capita, and material footprint per GDP
- Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
- By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment
- Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

Goal 13, Targets and Indicators

- Take urgent action to combat climate change and its impacts
- Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
- Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030

Goal 14, Targets and Indicators

- Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics
- Proportion of fish stocks within biologically sustainable levels
- By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information
- Coverage of protected areas in relation to marine areas

Goal 15, Targets and Indicators

- Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and dry lands, in line with obligations under international agreements
- Forest area as a proportion of total land area
- Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
- The following tables reflect the proportion of population below the international poverty line of US\$1.90 per day, both sexes, prevalence of undernourishment, Proportion of coastal and marine areas covered by protected areas and Manufacturing value added share in GDP at constant 2010 United States dollars of various countries/regions in the world. Certain statistical tools have been used such as Gamma Distribution, Normal Distribution and Pearson Correlation Coefficients to test the various variables/parameters/indicators pertaining to various countries/regions in the world for the period from 1999 to 2016.

Table-1: Proportion of Population Below the International Poverty Line of US\$1.90 Per Day, Both Sexes

(Percentage)

Regions	1999	2013
World	28	10.7
Sub-Saharan Africa	57.7	42.3
Northern Africa and Western Asia	9.6	2.6
Central and Southern Asia	37.5	14.4
Eastern and South-Eastern Asia	34.7	3.2
Latin America and the Caribbean	13.9	5.4
Australia and New Zealand	1.3	0.7
Oceania (excluding Australia and New Zealand)	44.3	27.2
Europe and Northern America	1.8	0.6

Source: *World Development Indicators Database, World Bank.*

Gamma Dist 9.55E-05 0.4181553

Returns the gamma distribution. One can use this function to study variables that may have a skewed distribution. The gamma distribution is commonly used in queuing analysis.

GAMMADIST (x, Alpha, Beta, Cumulative)

X is the value at which you want to evaluate the distribution.

Alpha is a parameter to the distribution.

Beta is a parameter to the distribution. If beta = 1, GAMMADIST returns the standard gamma distribution.

Cumulative is a logical value that determines the form of the function. If cumulative is TRUE,

GAMMADIST returns the cumulative distribution function; if FALSE, it returns the probability density function.

The equation for the gamma probability density function is:

$$f(x, \alpha, \beta) = \frac{1}{\beta^\alpha \Gamma(\alpha)} x^{\alpha-1} e^{-\frac{x}{\beta}}$$

$$f(x, \alpha) = \frac{x^{\alpha-1} e^{-x}}{\Gamma(\alpha)}$$

The standard gamma probability density function is:

When alpha = 1, GAMMADIST returns the exponential distribution with:

$$\lambda = \frac{1}{\beta}$$

Table-2: Prevalence of Undernourishment

(Percentage)

Regions	2000-02	2005-07	2010-12	2014-16a
World	14.9	14.3	11.8	10.8
Sub-Saharan Africa	30	26.5	24.1	23
Northern Africa and Western Asia	7.1	6.8	6	5.5
Northern Africa	<5.0	<5.0	6.2	5.8
Western Asia	8.9	8.4	8.1	7.6
Central and Southern Asia	18.3	19.8	15.9	15.4
Central Asia	14.5	12.9	9.8	7.7
Southern Asia	18.5	20.1	16.1	15.7
Eastern and South-Eastern Asia	16.8	15.3	11.5	9.3
Eastern Asia	14.9	14.3	11.3	9.2
South-Eastern Asia	22.3	18.3	12.1	9.6
Latin America and the Caribbean	11.4	8.4	6.4	5.5
Oceania	16.5	15.4	13.5	14.2

Australia and New Zealand	<5.0	<5.0	<5.0	<5.0
Oceania (excluding Australia and New Zealand)	16.5	15.4	13.5	14.2
Europe and Northern America	<5.0	<5.0	<5.0	<5.0
Europe	<5.0	<5.0	<5.0	<5.0
Northern America	<5.0	<5.0	<5.0	<5.0
Landlocked developing countries	33.6	28.1	24.1	22.7
Least developed countries	36.5	31.4	27.7	26.5
Small island developing States	22.5	21.3	18.2	18

Source: Food and Agriculture Organisation of United Nations (FAO).

a Projections.

GAMMA Dist 5.36825E-23 2.91619E-32 3.24109E-28 3.66796E-27

Returns the gamma distribution. You can use this function to study variables that may have a skewed distribution.

The gamma distribution is commonly used in queuing analysis. From the table it is observed that the various regions/countries for the variable(s) for the period 2000-02, 2005-07, 2010-12 & 2014-16 show skewed gamma distribution as it varies from range 2.91619E-32 to 5.36825E-23.

GAMMADIST(x, Alpha, Beta, Cumulative)

X is the value at which you want to evaluate the distribution.

Alpha is a parameter to the distribution.

Beta is a parameter to the distribution. If beta = 1, GAMMADIST returns the standard gamma distribution.

Cumulative is a logical value that determines the form of the function. If cumulative is TRUE, GAMMADIST returns the cumulative distribution function; if FALSE, it returns the probability density function.

The equation for the gamma probability density function is:

$$f(x; \alpha, \beta) = \frac{1}{\beta^\alpha \Gamma(\alpha)} x^{\alpha-1} e^{-\frac{x}{\beta}}$$

The standard gamma probability density function is:

$$f(x; \alpha) = \frac{x^{\alpha-1} e^{-x}}{\Gamma(\alpha)}$$

When alpha = 1, GAMMADIST returns the exponential distribution with:

$$\lambda = \frac{1}{\beta}$$

Table-3: Proportion of Coastal and Marine Areas Covered by Protected Areas

(Percentage)

Regions	2000	2005	2010	2016
World	1.72	2.89	7.44	12.74
Sub-Saharan Africa	0.2	0.25	4.75	8.96
Northern Africa and Western Asia	0.5	0.6	1.03	1.11
Central and Southern Asia	0.28	0.11	0.12	0.13
Eastern and South-Eastern Asia	1.97	2.5	3	3.56
Latin America and the Caribbean	1.45	1.66	3.17	9.64
Australia and New Zealand	2	6.12	16.56	34.3
Oceania (excluding Australia and New Zealand)	0.09	0.15	6.79	15.58
Europe and Northern America	4.19	6.99	12.57	13.43
Landlocked developing countries	1.38	1.49	1.81	1.81
Least developed countries	0.23	0.26	3.58	3.73
Small island developing States	0.19	0.26	2.42	7.68

Source: UNEP-WCMC (2017), *Protected Planet: The World Database on Protected Areas (WDPA)*

Mean 1.18 1.94 5.27 9.39

SD 1.208472615 2.3610745 4.90877693 9.37756846

Normal Dist **0.5656 0.1648 0.3653 0.0337**

Returns the normal distribution for the specified mean and standard deviation.

This function has a very wide range of applications in statistics, including hypothesis testing. From the table it is observed that the normal distribution function varies between 3 percent to 50 percent in range.

This indicates wide variability among the variables across various regions in the world.

NORMDIST(x, Mean, Standard dev, Cumulative)

X is the value for which you want the distribution.

Mean is the arithmetic mean of the distribution.

Standard_dev is the standard deviation of the distribution.

Cumulative is a logical value that determines the form of the function. If cumulative is TRUE,

NORMDIST returns the cumulative distribution function; if FALSE, it returns the probability mass function.

The equation for the normal density function (cumulative = FALSE) is:

$$f(x, \mu, \sigma) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

When cumulative = TRUE, the formula is the integral from negative infinity to x of the given formula.

Table-4: Manufacturing Value Added Share in GDP at Constant 2010 United States Dollars

(Percentage)

Regions	2000	2005	2010	2016
World	15.2	15.3	15.8	16.2
Sub-Saharan Africa	11.3	10.2	9.2	9.9
Northern Africa and Western Asia	11	11	11.3	11.6
Central and Southern Asia	14	14.6	15.5	16
Southern Asia	13.6	14.4	15.5	16.1
Eastern and South-Eastern Asia	20.9	22.4	25.3	26.2
South-Eastern Asia	23.7	24	23.1	22.6
Latin America and the Caribbean	16.1	15.8	14.4	13
Australia and New Zealand	9.8	9	7.8	6.9
Oceania (excluding Australia and New Zealand)	9	9.1	8.2	7.8
Europe and Northern America	13.8	13.4	13	12.7
Landlocked developing countries	13.8	12.6	11.3	10.9
Least developed countries	10.5	10.2	10.1	11.4
Small island developing States	22.6	22.3	21	19.1

Source: UNIDO MVA 2017 Database, United Nations Industrial Development Organisation (UNIDO).

Pearson Corr Coeff 0.990976

Returns the Pearson product moment correlation coefficient, r , a dimensionless index that ranges from -1.0 to 1.0 inclusive and reflects the extent of a linear relationship between two data sets. From the table it is observed that there exists a linear correlation coefficient between the variables for the various regions/countries for the above period (i.e. 2000, 2005, 2010 & 2016).

The formula for the Pearson product moment correlation coefficient, r , is:

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

where x and y are the sample means AVERAGE(array1) and AVERAGE(array2).

Concluding Observations

The research paper studies the relationships and inter-linkages existing between international trade and Sustainable Development Goals (SDGs) adopted by the United Nations, of various economies. It is observed that in order to fully implement the SDGs goals and their indicators adopted by the UN, least developing countries and particularly the small island developing states (SIDS) need to adjust their economies to adapt to achieving the SDGs by the turn of 2030 as slated by the UN. The paper also dwells into the issues of poverty, inclusiveness and equality, implementation of Addis Ababa Action Agenda on SDGs, National Level Efforts undertaken for Development of

International Community, discusses the recommendations of the 2017 Task Force on SDGs, issues on financing investment and social protection, domestic and international finance, international development cooperation, role of international trade in achieving SDGs and the 2030 Agenda, SDGs and their indicators, financing for development and small island developing states, SIDS and economic growth, SIDS and Human Development, SIDS, international climate and environmental funds & SIDS and remittances and SIDS and Financing for Shocks. Certain statistical tools such as Gamma Distribution, Normal Distribution and Pearson Correlation Coefficient have been estimated to analyze the economic and statistical relationships existing among the variables like SDGs & SIDS and their indicators such as human development, financing for development, environmental funds, financing for shocks etc., The paper analyzes that there are wide variations in the data sets and their statistical and probabilistic distribution functions with respect to these variables. Hence, it may not be possible to assign systematic economic and statistical relationships and inter-linkages among the parameters, which if systematic relationships could have been established, would have led to achieving the SDGs among the macro-variables for the various economies thereby leading to achieving the goals on SDGs by the turn of 2030, the target year set by UN. Sustainable Development and the Sustainable Development Goals (SDGs) suggest that countries achieve sustainable development in all three dimensions, that is, economic, social and environmental, simultaneously. In this context, international trade is expected to play its role as a means of implementation for the achievement of the SDGs. "Means of implementation" include factors that facilitate countries' progress towards the achievement of sustainable development, such as public and private financial resources, capacity building, and transfer of environmentally sound technologies. In practice, however, it remains a considerable challenge to trade policymakers to map out inter-linkages between trade policy and sustainable development, let alone to ensure that trade policy outcome positively influence sustainable development. In this increasingly globalised world, achieving the SDGs as universal agenda requires policy coherence at all (national, regional and global) levels, where trade policy and its policy and institutional interfaces with all the SDGs is one part of the jigsaw.

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