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ADVANCEMENTS AND STRATEGIES FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION

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ABSTRACT : The environment of our planet is degrading at an alarming rate because of non-sustainable urbanization, industrialization and agriculture. Unsustainable trends in relation to climate change and energy use, threats to public health, poverty and social exclusion, demographic pressure, management of natural resources, biodiversity loss, land use and transport still persist and new challenges are arising. Since these negative trends bring about a sense of urgency, short term action is required, whilst maintaining a longer term perspective. The main challenge is to gradually change our current unsustainable consumption and production patterns and also our approach to policy-making. This article and study covers the broad area including potential of rhizospheric microorganisms in the sustainable plant development in anthropogenic polluted soils, bioremediation of pesticides from soil and waste water, toxic metals from soil, biological treatment of pulp and paper industry wastewater, sustainable solutions for agro processing waste management, solid waste management on climate change and human health, environmental impact of dyes and its remediation. The article tries to look upon a unique treatment of the subject, linking various protection strategies for sustainable development, describing the inter-relationships between the laboratory and field eco-toxicologist, the biotechnology consultant, environmental engineers and different international environmental regulatory and protection agencies**.** The world economies have unified in their efforts to achieve the goals of sustainable development. This is in sheer contrast to the earlier approaches where governments pursued goals for the growth and development of their respective economies. The struggle for growth and excellence has created imbalance in the economic development among countries, depleted some of the natural resources and has thus altered the ecological balance. The impact of this is being experienced in the form of global warming and climate change. Since this threatens the very existence of human life on earth, a course of action that would ensure a safe environment for future generations has become the need of the hour. Sustainable development is a term coined to ensure that development takes place in such a way

that natural resources are sustained and passed on to the future generations unimpaired. This paper makes an attempt to understand the challenges encountered by India in achieving Sustainable development goals and offers suggestions to overcome them.

KEY WORDS : Millennium Development Goals (MDG), Sustainable Development Goals (SDG), Ibrahim Index of African Governance (IIAG)

INTRODUCTION : Sustainable Development has become the buzz word of the international community. The struggle for growth and excellence has created imbalance in the economic development among countries, depleted some of the natural resources and has thus altered the ecological balance. Since this threatens the very existence of human life on earth, a course of action is required to ensure a safe environment for future generations. Sustainable development is a term coined to ensure that development takes place in such a way that natural resources are sustained and passed on to the future generations unimpaired. Seventeen Sustainable Development Goals (SDGs) aimed to build a more prosperous, more equal, and more secure world by the year 2030 have been developed. They have been adopted by 193 Member States at the UN General Assembly Summit in September 2015 as a part of their agenda for Sustainable Development. India is also a signatory to this summit and is strongly committed to the 2030 agenda.

The Sustainable Development Goals : The Sustainable Development Goals (SDGs) which came into effect on 1 January, 2016 is an improvement on the Millennium Development Goals (MDGs). In India, as far as MDGs are concerned, considerable progress has been made in the field of basic universal education, gender equality in education, and global economic growth. However there was slow progress in the improvement of health indicators related to mortality, morbidity, and various environmental factors contributing to poor health conditions. With SDGs in place the Indian government is now trying to integrate the efforts taken towards achieving MDGs with SDGs. SDGs are wider in scope.

Sustainable Development Goals have been built on the universal principle of 'leave no one behind'. As far as India is concerned, the national development goals of India, converge well with the SDGs and India is expected to play a leading role in determining the success of the SDGs, globally. The 17 SDGs are as follows :

Source: www.un.org/sustainabledevelopment/sustainable-development-goals/

Goal 1	End poverty in all its forms everywhere
Goal 2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3	Ensure healthy lives and promote well-being for all at all ages
Goal 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5	Achieve gender equality and empower all women and girls
Goal 6	Ensure availability and sustainable management of water and sanitation for all
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10	Reduce inequality within and among countries
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12	Ensure sustainable consumption and production patterns
Goal 13	Take urgent action to combat climate change and its impacts*
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Measures taken for implementing SDGs in India : NITI Aayog, the Government of India's think tank, has been entrusted with the task of coordinating the SDGs. States have also been advised to undertake a similar mapping of their schemes, including centrally sponsored schemes. In addition, the Ministry of Statistics and Programme Implementation (MoSPI) is engaged in the process of developing national indicators for the SDGs. Many of the Government's flagship programmes such as Swachh Bharat, Make in India, Skill India, and Digital India are at the core of the SDGs. State and local Governments play a pivotal role in many of these programmes. State governments are paying keen attention to visioning, planning, budgeting, and developing implementation and monitoring systems for the SDGs.

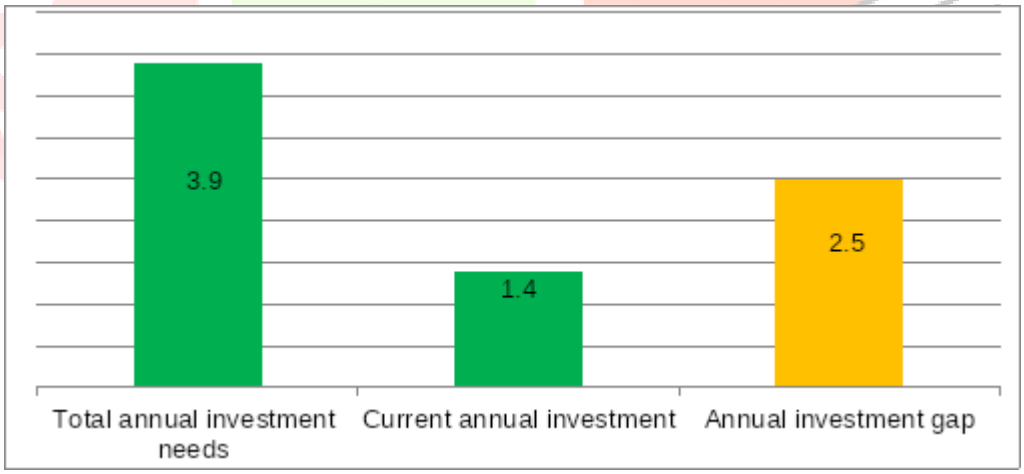
UN Support for SDG initiatives in India: The United Nations in India supports the participation of civil society organisations, think tanks and the Indian media in discussions and side sessions at the International Conference on Financing for Development at Addis Ababa and during the General Assembly in New York. The UN Country Team in India supports NITI Aayog in its efforts to address the interconnectedness of the goals, to ensure that no one is left behind and to advocate for adequate financing to achieve the SDGs. In close collaboration with NITI Aayog and partners, the UN has supported thematic consultations on the SDGs to bring together various state governments, central ministries, civil society organisations and academia to deliberate on specific SDGs.

Support to State Governments : The UN in India currently supports five State governments (Assam, Chhattisgarh, Gujarat, Haryana, and Odisha) in localising the SDGs to address key development challenges at the state level.

Challenges in attaining SDGs in India : Four areas have been identified as areas of concern for India in Achieving SDGs. They are as follows :-

- **Defining Indicators :**One of the major challenges for India is devising suitable indicators to effectively monitor the progress of SDGs. India's past records reveal that it has not been very successful in setting relevant indicators to measure outcomes. The definition for "safe" drinking water has been misconstrued with the availability of hand pumps and tube wells and the official data suggested that 86% of Indians had access to safe drinking water and therefore were "on track" for the MDG goal on drinking water . But the number of waterborne diseases and deaths due to diarrhea are quite high in India.
- **Financing SDGs :** Despite India's best efforts to reduce poverty it has the highest number of people living below international poverty line. As per the World Bank report 2013, 30 per cent of its population was under the $1.90-a-day poverty measure. According to the United Nations MDG 2014 report, despite high economic growth, in 2010, one-third of the world's 1.2 billion extreme poor lived in India alone. At today's level of investment – public and private in SDG related sectors in developing countries, an average annual funding shortfall over 2015-2030 of some $2.5 trillion remains. This gap can be bridged only through increased private sector investments, especially in infrastructure, food security and climate change mitigation sectors.

Gap in funding SDGs in developing countries



Source unctad.org/en/pages/PressRelease.aspx?OriginalVersionID=194

In India, A new study estimates that implementing SDGs in India by 2030 will cost around US$14.4 billion. Given the recent cut in social sector schemes in India there is likely to be a significant funding gap.

- **Monitoring and Ownership:** A third significant challenge in implementing SDGs would be with respect to ownership. Though NITI Aayog is expected to play the lead role in tracking the progress of SDGs, its members have expressed reservations on being able to take on this mammoth task.
- **Measuring Progress**: The last challenge is how to measure the progress or achievement of SDGs. The Indian government has admitted that non-availability of data (particularly in respect to sub-national

levels), periodicity issues and incomplete coverage of administrative data, have made accurate measuring progress of even MDGs virtually impossible.

Measures to overcome Challenges : The challenges discussed can be overcome by developing an exclusive model for implementing, monitoring, measuring and reporting SDG related course of action. Though India has well established organizations such as the CSO to provide statistical data many times they are general and do not match specific requirements. Even in case of MDGs, India was not able to measure its achievement accurately because of lack of data. Therefore developing suitable indicators to assess the progress of SDGs and also simultaneously developing a system that can support this exercise by supplying the required data is of paramount importance.

A separate index for measuring the progress or achievement of SDGs can be developed by taking the Ibrahim Index of African Governance (IIAG) as a base.

Ibrahim Index of African Governance (IIAG) : The Ibrahim Index of African Governance (IIAG) measures the quality of governance in every African country on an annual basis. The IIAG was launched in 2007 and has evolved to be the most comprehensive assessment on African governance. As governance is not measurable directly, IIAG has developed the most suitable set of proxy indicators for the purpose by making use of a variety of data sources and indicators. IIAG does not collect primary data, but rather collates data provided by respected external sources. The IIAG data set is updated every year when practical improvements are identified and the results are made available from 2000. Whenever new historical data are made available, or the structure of the IIAG is strengthened, the entire data set is updated back to 2000. The latest 2016 IIAG consists of 95 indicators from 34 data providers.

Techniques used in developing IIAG : Some of the techniques used in developing IIAG are worth noting and may be applied in the Indian context also.

- ✓ **Clustered Indicators :** Indicators measuring a specific governance concept are sometimes available from multiple sources. To improve the accuracy of the indicator measurement and avoid double counting, these measures are combined into a single clustered indicator, which is the average of its underlying sub-indicators.
- ✓ **Handling Missing Data :** Most indicators included in the IIAG have missing data points over the time series. As this can have an effect on a country's aggregate scores, estimates are provided for missing data, following a statistical process called imputation. According to this process, if data is missing outside the time series, it is replaced by an existing data point. When data is missing inside the time series, these are replaced with numbers incrementally higher or lower than the neighboring data points.
- ✓ **Normalisation :** Given that the data utilised in the construction of the IIAG come from 35 separate data providers that present their data on different scales, it is necessary to standardise all data. This is done through a statistical process called normalisation whereby raw data for each indicator are transformed by the min-max normalisation method. This process allows all scores to be published in common units and within the same bounds of 0-100, where 100 is always the best possible score.

- ✓ **Data Aggregation:** The IIAG uses a transparent, simple and replicable method of data aggregation. A simple average is calculated using the structure of the Index to arrive at the Overall Governance scores.

All of the above four techniques are ideal and very much applicable for India. The Administrative system in India is highly bureaucratic with two Governments, one at the centre and the other at the state level. This has resulted in duplication of data. Even the available has gaps in it and suffers from errors of standardization. All this can be resolved by developing an Indian Index of Sustainable Development (IISD) by following the techniques discussed above. IISD can be developed for a period of 15 years from 2015-30. The data set can be updated every year according to recent developments and revised for all the 15 years by following the same pattern of Ibrahim index. This would ensure availability of the most recent data set.

Financing SDGs : The challenge of financing SDGs can be resolved to some extent by strengthening the existing academic infrastructure in the nation. India is a regional hub for higher education and boasts itself for being the home town of several renowned institutions such as IIT and IIM. These institutions have well developed infrastructure for research. These resources can be pooled and effectively utilised in designing, developing and measuring indicators meant for sustainable development.

In developing countries like India, there was some hesitation in reducing carbon emissions for two reasons, first their per capita emissions were lower, second, it would mean compromising with the development of the nation.[19] Therefore a carbon trading system was evolved among the countries of the world where firms were permitted to emit carbon within the prescribed limit and were assigned carbon credits for this purpose If any firm wants to exceed the limit it can buy the unused credit from another firm. In this way the buying firm is penalized for exceeding its carbon quota and the selling firm is rewarded for reducing its emissions. Governments can consider the idea of penalizing firms with higher carbon footprints by making them finance the sustainable goal programmes in the developing and least developed countries.

The Responsibility Of Implementing SDGs : With NITI Ayog expressing its doubt as to how far it would succeed in this laborious task it is high time the Indian Government decentralises this task and while doing so it must be borne in mind that SDGs aim at conserving and passing on the natural resources to the next generation. This cannot be done without involvement of the society. But a society so knowledgeable to use its natural resources in a perfectly ecologically sound manner is nearly impossibility. Changing social, political, cultural, technological and ecological conditions will exert new pressures on the natural resource base and the possibility of its misuse or overuse always remains [20]. Therefore a political order in which decision making will be done by those who would suffer the consequences of those decisions would be ideal. A new system that would ensure participation from groups that are directly connected to the problem needs to be evolved.

CONCLUSION:

Sustainable Development(SD) has attracted much attention in the academic, governance, planning and development intervention space. A wide range of governmental and non-governmental entities appear to have embraced it as an appropriate development paradigm. This is because most, if not all proponents and advocates of the paradigm, virtually seem to concur that the challenges confronting humankind today such as climate change, depletion of ozone layer, water scarcity, loss of vegetation, inequality, insecurity, hunger, deprivation and poverty can be addressed by adhering to the tenets and principles of SD.

The ultimate aim of SD is to achieve a balance among environmental, economic and social sustainability, thus, making these the pillars on which SD rests. While not assuming a definitive posture, sustainability of society can be said to depend on the availability of proper health systems, peace and respect for human rights, decent work, gender equality, quality education and rule of law. Sustainability of economy, on the other hand, depends on adoption of appropriate production, distribution and consumption while sustainability of the environment is driven by proper physical planning and land use as well as conservation of ecology or biodiversity.

SD cannot be achieved through isolated initiatives, but rather integrated efforts at various levels, comprising social, environmental and economic aspects. The successful implementation of the SDGs will rely upon disentangling complex interactions among the goals and their targets. An integrated approach towards sustainability would require realising the potentials of its key dimensional pillars simultaneously, as well as managing the tensions, trade-offs and synergies among these dimensions. More importantly, in managing the tensions of sustainability and sustainable development, a key role has to be played by international organisations and agencies such as the UN, government of various countries, nongovernmental organisations and civil society organisations.

India is a country with the second largest population in the world. The steps taken by India for the achievement of SDGs matter a lot to the world. If India succeeds in attaining the SDGs it would mean a larger section of the world has achieved it. Therefore it is imperative for India to develop effective methods for implementing, monitoring and measuring the progress of SDGs. The biggest challenge for India seems to be the development of suitable indicators. This can be handled by developing an Indian Index for Sustainable Development (IISD) by taking the Ibrahim index as a base.

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