A Novel System, Method and Perspective Plan for the Assessments of Higher Education's Progress Towards the UN Sustainable Development Goals

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Education is considered an integral element for Sustainable Development and Sustainable Development Goal (SDG) 4 on quality education is a key enabler for all other SDGs. Therefore, research is primarily focused on roles and responsibilities of Higher Education Systems and in the same direction a novel System, Method and Perspective Plan in form of a Project is proposed which will facilitate any country in formation of a Global Knowledge Hub, a data service provider for common people, for researchers, for the Ministry, for each Institution, for the UN representatives and for other associated stakeholders. In addition to this, this will exactly reflect contributions made so far by Higher Education Systems and its' outcomes. This will also reflect, how Higher Education Systems are helping to achieve 17 UN Sustainable Development Goals and their targets by 2030. In the paper, some additional useful information is cited pertaining to UN-SDGs based on the published documents in a sequential and systematic manner and this will help to understand better about the mission, vision and objectives of UN Sustainable Development Goals, what are the roles and responsibilities of Higher Education Systems in the same context till 2030 onwards with a constant approach, the initiatives which have been taken so far and the initiatives being undertaken now. Some additional measures and about convergence are also suggested. It is also discussed well about SDG Index & Dashboards and about some major thrust areas. Since, some additional useful information is cited, source of information for each citation is properly mentioned in the references column.

Introduction

During the survey and study process of published materials (cited under references) over net, we have observed, primary goal of the United Nations on the Sustainability Development is the survival of humanity. The goals recognize to end poverty on priority, to build a strong economic development and implementation policies, to strengthen the education and health systems, to enforce mechanisms for the social protection, to create job opportunities, to consider and implement necessary policies on climate change and environmental protection, eradicate inequality between gender, castes, race, origin, disability, age, economic, and religions, implement policies to eradicate unsustainable consumption patterns, weak institutional capacity and environmental degradation. However, there are several other important issues to think upon and those issues are mentioned below in the UN-SDGs 17 goals and their targets. According to Tang, Leicht, and Heiss (2017), for the goals to be reached, everyone needs to do their part: governments, the private sector, civil society and every human being across the world. Governments are expected to take ownership and establish national frameworks, policies and measures for the implementation of the 2030 Agenda. Thus, with respect to the SDGs, all countries can be considered as developing and all countries need to take urgent action. However, not all kinds of education support sustainable development. Education that promotes economic growth, alone, may also lead to an increase in unsustainable consumption patterns. According to UNESCO. (2020), the Education for Sustainable Development is recognized as an integral element of Sustainable Development Goal (SDG) 4 on quality education and a key enabler of all other SDGs.

Since, implemenation of all other SDGs deeply rely upon (SDG) 4, there should be some mechanisms to regularly assess contributions and outcomes of (SDG) 4. However, every country is releasing the dashboard in general for the SDGs.

No such assessment interface was found during the survey phase pertaining to contributions and outcomes of Higher Education Systems. Therefore, a novel System, Method and Perspective Plan is proposed in form of a project in the research article which is mentioned below at page 7 and the same project can be adopted by any country. However, there are many digital library systems across the world simply providing community learning resources in general through a single-window such as textbooks, books, articles, audio lectures, video lectures, images, animation, simulation, theses, manuscripts and many more. But there is no such mechanism to timely and frequently relase updated and summarized statiscal information and outcomes

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country-wise petaining to SDGs which is to be considered as an assessment tool to assess the progress (an interface) in form of the data dashboard.The research article includes some citations of the fruitful information based on the published documents such as MDGs, Preamble of the UN 17 Sustainable Development Goals, UN 17 Sustainable Development Goals (SDGs) and Role of Higher Education in SDGs, progress in India including status of higher education. Thrust areas, convergene and suggestive measures, initiatives taken, initiatives being undertaken, SDG Index & Dashboards and finally includes a Novel System Proposed, Results and Discussion, Limitation of Study, Acknowledgement and Conflict of Interest.

According to MDG Monitor (2016), initially, the United Nations Millennium Development Goals (MDGs) with eight goals was came into effect which was set by the 189 UN member states in September 2000 and agreed to be achieved by the year 2015. 149 international leaders in attendance committed to combating disease, hunger, poverty, illiteracy, discrimination against women and environmental degradation. The MDGs were derived from this Declaration, and specific indicators and targets were attached to them. There are eight Millennium Development Goals: 1) to eliminate extreme poverty and hunger; 2) to achieve global primary education; 3) to empower women and promote gender equality; 4) to reduce child mortality; 5) to promote maternal health; 6) to fight malaria, HIV/AIDS, and other diseases; 7) to promote environmental sustainability; and 8) to develop a universal partnership for development.

According to World Health Organization. (2018), Newsroom, Fact sheets, Detail, Millennium Development Goals (MDGs) (2018), **the** MDGs have been superseded by the Sustainable Development Goals (SDGs). According to Rajesh Tandon and Pooja Pandey (2017), then the United Nations ambitious 2030 Agenda was then signed more than three [six] years ago by most member countries. It comprises 17 Sustainable Development Goals, which are universally applicable to all countries of the world. Recent UN reports indicate uneven progress towards achieving these goals in most countries[1].

According to Tang, Leicht and Heiss (2017), education systems must respond to this pressing need by defining relevant learning objectives and learning contents, introducing pedagogies that empower learners, and urging their institutions to include sustainability principles in their management structures. The UN SDGs cover global challenges that are crucial for the survival of humanity. The goals recognize that ending poverty must go hand-in-hand with strategies that build economic development. They address a range of social needs including education, health, social protection and job opportunities while tackling climate change and environmental protection. The SDGs address key systematic barriers to sustainable development such as inequality, unsustainable consumption patterns, weak institutional capacity and environmental degradation.

Preamble of the UN 17 Sustainable Development Goals

According to United Nations, General Assembly. (2015), this Agenda is a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. We recognize that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development. All countries and all stakeholders, acting in collaborative partnership, will implement this plan. We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet. We are determined to take the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path. As we embark on this collective journey, we pledge that no one will be left behind. The 17 Sustainable Development Goals and 169 targets which we are announcing today demonstrate the scale and ambition of this new universal Agenda. They seek to build on the Millennium Development Goals and complete what these did not achieve. They seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls. They are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental. The Goals and targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet: 1) People: We are determined to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfill their potential in dignity and equality and in a healthy environment, 2) Planet: We are determined 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, 3) Prosperity: We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature, 4) Peace: We are determined 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 and 5) Partnership: We are determined to mobilize the means required to implement this Agenda 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. The interlinkages and integrated nature of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new agenda is realized. If we realize our ambitions across the full extent of the agenda, the lives of all will be profoundly improved and our world will be transformed for the better. According to Atasi Mohanty (2018), moreover, this is also recognized that policy instruments or technological solutions are not going to be enough for achieving SDGs; rather behavioral change and public awareness are very crucial for sustainable development. According to United Nations Educational, Scientific and Cultural Organization. (2018), the 2030 Agenda for Sustainable Development provides a global blueprint for dignity, peace and prosperity for people and the planet, now and in the future. A few years into the agenda, we see how civil society, private sector, and governments are translating this shared vision into national development plans and strategies.

The UN 17 Sustainable Development Goals (SDGs)

According to United Nations, General Assembly (2015) and Bokova (2017), following are the 17 UN-SDGs: GOAL 1: No Poverty [End poverty in all its forms everywhere], GOAL 2: Zero Hunger [End hunger, achieve food security and improved nutrition and promote sustainable agriculture], GOAL 3: Good Health and Well-being [Ensure healthy lives and promote well-being for all at all ages], GOAL 4: Quality Education [Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all], GOAL 5: Gender Equality [Achieve gender equality and empower all women and girls], GOAL 6: Clean Water and Sanitation [Ensure availability and sustainable management of water and sanitation for all], GOAL 7: Affordable and Clean Energy [Ensure access to affordable, reliable, sustainable and clean energy for all], GOAL 8: Decent Work and Economic Growth [Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all], GOAL 9: Industry, Innovation and Infrastructure [Build infrastructure, promote inclusive and sustainable industrialization and foster innovation], GOAL 10: Reduced Inequality [Reduce inequality within and among countries], GOAL 11: Sustainable Cities and Communities [cities and human settlements inclusive, safe, resilient and sustainable], GOAL 12: Responsible Consumption and Production [Ensure sustainable consumption and production patterns], GOAL 13: Climate Action [Take urgent action to combat climate change and its impacts], GOAL 14: Life Below Water [Conserve and sustainably use the oceans, seas and marine resources for sustainable development], GOAL 15: Life on Land [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: Peace and Justice Strong Institutions [Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels] and GOAL 17: Partnerships to achieve the Goal [Strengthen the implementation and revitalize the global partnership for sustainable development]

The 17 sustainable development goals (SDGs) and their Targets

According to United Nations, General Assembly. (2015) and Bokova, I. (2017), we may find details of targets for each goal have been fixed.

Role of Higher Education in SDGs and their Targets

According to Coers et. al. (2020), "each of these challenges requires academic knowledge from a range of disciplines and types of analysis". Higher education has an essential role in the achievement of the SDGs and sustainable development more broadly. "Universities and other higher education institutions have a critical role in helping society achieve the Sustainable Development Goals (SDGs) through their research, learning and teaching, campus operations and leadership". Higher education institutions also play an essential role in disciplinary and interdisciplinary research to generate knowledge to better address diverse, sustainable development challenges. "To increase the likelihood of success for these 17 SDGs, higher education institutions worldwide must teach and train today's students – tomorrow's decision-makers – to think both critically and

ethically, to learn to cope with ethical dilemmas and apply systems-thinking approaches to serious and complex societal problems[2] ".

According to Tahl Kestin et.al. (2017) and EUA (2018), we must also focus on leadership/external leadership; strengthening public engagement and participation in addressing the SDGs; initiating and facilitating cross-sectoral dialogue and action; ensuring higher education sector representation in national implementation; helping to design SDG based policies; and demonstrating sector commitment to the SDGs. Please also see the details under column "What can universities do?" in the same article.

Sustainable Development Goal (SDG) 4 on quality education and a key enabler of all other SDGs

According to I. Bokova (2017), however, not all kinds of education support sustainable development. Education that promotes economic growth alone may well also lead to an increase in unsustainable consumption patterns. The now well-established approach of Education for Sustainable Development (ESD) empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society for present and future generations. ESD aims at developing competencies that empower individuals to reflect on their own actions, taking into account their current and future social, cultural, economic and environmental impacts, from a local and a global perspective. Individuals should also be empowered to act in complex situations in a sustainable manner, which may require them to strike out in new directions; and to participate in socio-political processes, moving their societies towards sustainable development. ESD has to be understood as an integral part of quality education, inherent in the concept of lifelong learning: All educational institutions – from preschool to tertiary education and in non-formal and informal education – can and should consider it their responsibility to deal intensively with matters of sustainable development and to foster the development of sustainability competencies. ESD provides an education that matters and is truly relevant to every learner in the light of today's challenges. ESD is holistic and transformational education that addresses learning content and outcomes, pedagogy and the learning environment. Thus, ESD does not only integrate contents such as climate change, poverty and sustainable consumption into the curriculum; it also creates interactive, learner-centered teaching and learning settings. What ESD requires is a shift from teaching to learning. It asks for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity and the linking of formal and informal learning. Only such pedagogical approaches make possible the development of the key competencies needed for promoting sustainable development. By 2030, ensure that all learners acquire knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

Thrust Areas, Status of Higher Education Institutions, Initiatives Taken, Suggestive Measures & Convergence, SDG Index & Dashboards in perspective of India and under the purview of SDGs.

In this column, some discussions have been made about the strength and dimension of the higher education in India. Thrust areas which are to be given first priority, initiatives that have already been taken in perspective of UN-SDGs, initiatives that are being undertaken, suggestive measures, what the scopes of convergence are and SDG Index and the Dashboards have been discussed.

Thrust Areas

According to Tandon, Pandey (2017) and Batra et.al. (2021), India is one of the critical countries where achievement of the SDGs will be essential for realizing the 2030 Agenda in the forthcoming years. India has a population of 1.36 billion people[1], of which two-thirds are located in 650 thousand villages; others in 8,000 urban centres and in over 75 mega cities and metros. One-third of the world's poor are in India[2] (SDG 1: No Poverty); regular media reports indicate continued hunger amongst some indigenous and caste communities[3]. (SDG 2: Zero Hunger); child malnutrition indicators in India are worse than in several low income countries (SDG 3: Health & Well-being); entrenched patriarchy restricts education for girls after puberty (SDG 5: Gender Equality); access to safe water is decreasing (SDG 6: Clean Water & Sanitation); and several Indian cities have the worst air pollution levels in the world[4] (SDG 11: Sustainable Cities & Communities). Much needs to be done in India for systemic progress on the SDGs before 2030.

According to Karayi (2019), India representing one seventh of the world's population, the world cannot achieve its Sustainable Development Goals (SDGs) without India's support. Thus, an ambitious, 10-year plan commencing in 2020 focuses on helping India accelerate progress towards achieving its SDG targets by 2030.

Status of Higher Education Institutions

According to Tandon, Pandey (2017) and Batra et.al. (2021), India's higher education sector is the third largest in the world. There are 903 (updated numbers as per AISHE 2019-20: 1043) universities, more than 10,000 professional technical institutes (updated numbers as per AISHE 2019-20: 11779) and 42,000 colleges (updated numbers as per AISHE 2019-20: 39955), in both the public and private sectors. Including technical and professional institutions, about 36.6 million students were enrolled in these postsecondary educational institutions as per the All India Survey of Higher Education Data (2017-18) and (updated numbers as per AISHE 2019-20: 38.53 Under Graduate level across India). Moreover, these numbers are rapidly increasing. Despite being such a large sector, conversations about the integration of the SDGs in the operations of higher education institutes (HEIs) are still rather weak.

Initiatives taken

According to Rajesh Tandon and Pooja Pandey (2017), at the policy level in India, much of the attention to the SDGs is being led by the national government through NITI Aayog, which has created a national framework. The Ministry of Statistics and Programme Implementation (MoSPI) is assisting NITI Aayog in interacting with other ministries and developing indicators reflecting the SDG goals and targets. However, educational institutions have remained somewhat disconnected from the SDGs.

According to NITI Aayog, Sustainable Goals, Line Ministries, as per the Niti Aayog, as SDGs cover almost every area of development, all Line Ministries are direct or indirect partners in the SDG efforts. However, the Vertical has developed close associations with: Ministry of Statistics and Programme Implementation, Ministry of Development of North Eastern Region, Ministry of Finance, Ministry of Education, Ministry of Health and Family Welfare and Ministry of Women and Child Development

According to Krishna and Noda (2021), the premier policy 'Think Tank' of the Government of India, developed an SDG India Index in 2019 to provide a holistic view on the social, economic and environmental status of the country and its States and UTs. The index was designed to provide an assessment of the performance of all Indian States and UTs, and to help leaders and change-makers evaluate their performance against the SDGs and identify priority areas where urgent action is needed. According to Krishna and Noda (2021) and NITI Aayog (2021), a table of performance of states and UTs on indicators of SDG 4 is mentioned.

According to NITI Aayog (2021), the Index for Sustainable Development Goals (SDGs) evaluates progress of states and Union Territories (UTs) on various parameters including health, education, gender, economic growth, institutions, climate change and environment. The index is developed in collaboration with the United Nations in India. It tracks the progress of all states and UTs on 115 indicators aligned with the National Indicator Framework (NIF) of the Ministry of Statistics and Programme Implementation.

Suggestive Measures & Convergence to be taken or being taken (Bridging the Gap in Teaching & Research on SDGs in HEIs in India)

According to Rajesh Tandon, Pooja Pandey (2017), despite being such a large sector, conversations about the integration of the SDGs in the operations of higher education institutes (HEIs) are still rather weak, and national associations of higher education have not taken up the matter either. The Association of Indian Universities (AIU) is the oldest such network, mostly including public institutions. The Federation of Indian Chambers of Commerce and Industry (FICCIs) Higher Education Committee has been bringing together private institutions for the past two decades. Neither has inspired their members to focus on the SDGs as a core function of HEIs. Not even NITI Aayog's national approach to achieving the SDGs in India contains any mention of HEIs, or their possible contributions. Perhaps in parallel to this, the University Grants Commission (UGC), the senior policy-making body on higher education in India, has just announced a new policy framework Fostering Social Responsibility and Community Engagement in Higher Education Institutions in India (2019)[12]. These new guidelines recommend that "The goals of fostering social responsibility and community engagement in *HEIs*" can comprise of: Improving the quality of teaching/learning in HEIs, by bridging the gap between theory and practice through community engagement; Promoting deeper interactions between higher educational institutions and local communities for identification and solution of

real-life problems faced by the communities in a spirit of mutual benefit; Facilitating partnerships between local communities and institutions of higher education so that students and teachers can learn from local knowledge and wisdom; Engaging higher institutions with local communities in order to make curriculum, courses and pedagogies more appropriate to achieving the goals of national development; Catalysing acquisition of values of public service and active citizenship amongst students and youth alike, which would also encourage, nurture and harness the natural idealism of youth; Undertaking research projects in partnership with local communities through community-based research methods. Further, the above guidelines recommend that existing courses should be re-designed to integrate interactions with local society in learning process. Additionally, these guidelines propose that new courses that are relevant to changing societal contexts should be offered as options to all students. "Such courses can be audited by students, or taken as a part of 25% provision for external (to faculty) courses now allowed by UGC guidelines. These can be short-term certificate courses, or integrated into the existing syllabus. By their very nature, such courses are trans-disciplinary and require community engagement activities by students. Additionally, new courses which teach about Sustainable Development Goals (SDGs) will provide local understanding about some of these goals to students, in addition to learning about Agenda 2030". Therefore, discussions about integrating the SDGs within HEIs, their professional associations and networks in India will hopefully gather some momentum soon.

SDG Index & Dashboards

According to Sachs, J. D. et.al. (2021), the Sustainable Development Report (formerly the SDG Index & Dashboards) is a global assessment of countries' progress towards achieving the Sustainable Development Goals. It is a complement to the official SDG indicators and the voluntary national reviews. The 2021 SDG Index: from Download Report & Materials; the SDG Index is an assessment of each country's overall performance on the 17 SDGs, giving equal weight to each Goal. The score signifies a country's position between the worst possible outcome (0) and the best, or target outcome (100). For example, Finland's overall index score (85.9) suggests it is, on average, 86 percent of the way to the best possible outcome across the 17 Goals.

According to Guillaume Lafortune et.al. (2018), the SDG Index and Dashboards Report benchmarks the performance of countries on the Sustainable Development Goals (SDGs) adopted in September 2015 by the global community. Official indicators are not sufficient to monitor comprehensively the implementation of the SDGs and that non-official data sources can help bridge this gap. Non-official data sources include data produced in research institutions, Universities, civil society and other partners.

According to NITI Aayog. (2021), as per the NITI Aayog, from covering 13 Goals with 62 indicators in its first edition in 2018, the third edition covers 16 Goals on 115 quantitative indicators, with a qualitative assessment on Goal 17, thereby reflecting our continuous efforts towards refining this important tool," said Ms. Sanyukta Samaddar, Adviser (SDGs), NITI Aayog.

According to NITI Aayog, (2020), SDG India Index in 2020 as per Niti Aayog is 66 and according to Sustainable Development Report 2021 Includes the SDG Index and Dashboards: The Decade of Action for the Sustainable Development Goals, India at 60.1. According to NITI Aayog, (2020), there are four categories based on the SDG Index score — aspirant: 0–49; performer: 50–64; front-runner: 65–99, achiever: 100. According to NITI Aayog, (2021), National Institution for Transforming India (NITI) , As per the NITI Aayog, SDG Index Score for Goal 4 ranges between 29 and 80 for States and between 49 and 79 for UTs. According NITI Aayog. (2021), overall, currently, there are no states in the aspirant and achiever category; 15 states/UTs are in the performer category and 22 states/UTs in the front runner category. According to Sustainable Development Report, The SDG Index and Dashboards, Part 2, the SDG dashboards highlight each country's strengths and weaknesses in relation to the 17 goals, presenting performance in terms of levels and trends.

SDG Index Methodology and Overall Results and Findings

According to NITI Aayog. (2021), the country's overall SDG score improved by 6 points—from 60 in 2019 to 66 in 2020–21. This positive stride towards achieving the targets is largely driven by exemplary country-wide performance in Goal 6 (Clean Water and Sanitation) and Goal 7 (Affordable and Clean Energy), where the composite Goal scores are 83 and 92, respectively. The SDG India Index 2020: Methodology is also given below:

Methodology

Based on globally accepted SDSN methodology
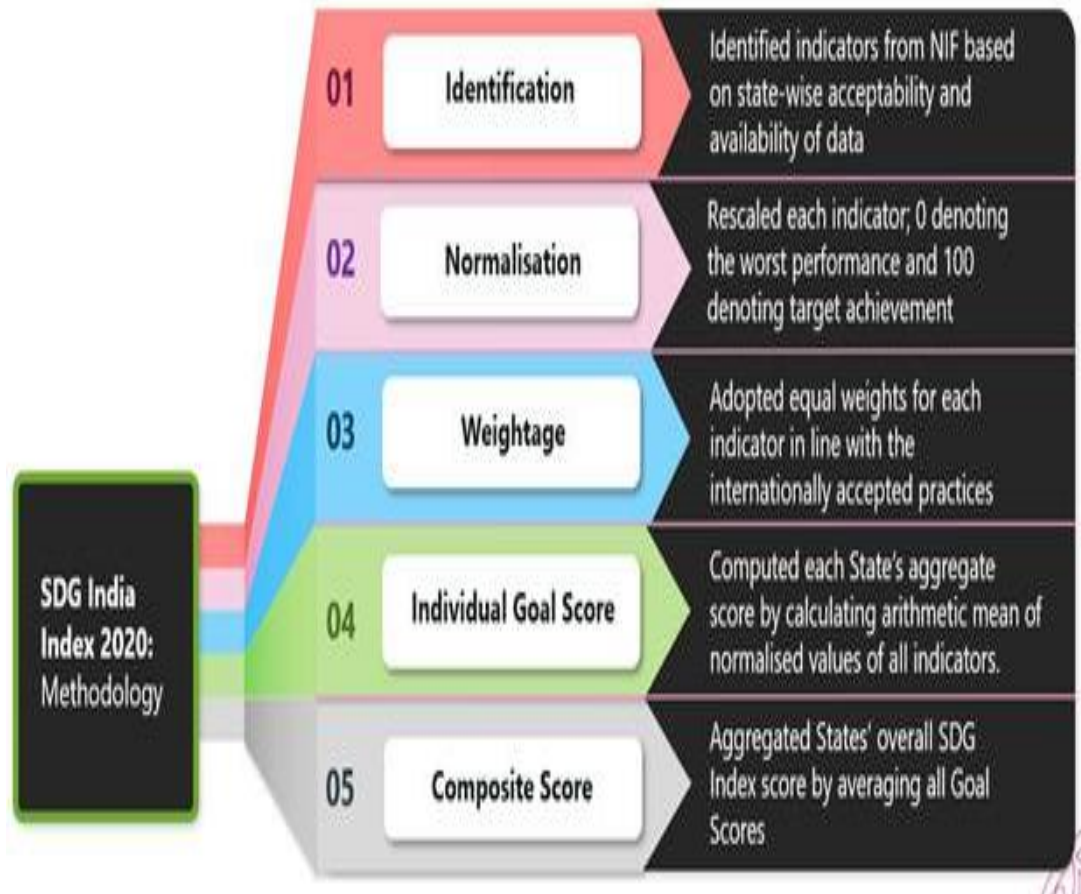
SDG India Index 2020: Methodology

A Novel System, Method and Perspective Plan Proposed in form of a Project

Before mentioning a novel system proposed in the form of a project in this research article, according to Agne et.al. (2020), please see the quote of Kumsal Bayazit CEO, Elsevier, 2020 "It is our goal to do everything we can to ensure that our unique strengths in content, data, and analytics help researchers and health professionals make the targets set by the United Nations in 2015 a reality.". The Power of Research to Advance the SDGs: Mapping research data to address existing gaps and further progress towards the 2030 Sustainable Development Goals. In 2015, the United Nations Sustainable Development Goals (SDGs) set an ambitious 2030 target to achieve a sustainable and equitable future for our planet. 2020 marks five years since then and remaining ten years we have to achieve them since 2020. Research provided by the global research community forms the essential basis for society to make gains in life expectancy, poverty reduction and global health that we have seen in the last century. Research leads the way to change. Our latest report, The Power of Data to Advance the SDGs, shows that over the last five years SDG-related publications have reached a staggering 4.1 million articles.

A novel system, method and perspective plan is proposed, this is a kind of assessments tool for Higher Education's progress towards the UN Sustainable Development Goals. This is similar to conducting mapping of publications production and bibliometric, mapping of human resource data, and also other useful publications production and which are in perspective of SDGs. The system is a narrowed version of big data digitization in perspective of the SDGs. The development of systems will generate unique opportunities to

strategically address challenges associated with the United Nations Sustainable Development Goals (SDGs) to ensure an equitable, environmentally sustainable, poverty, hunger, child labour, economic growth, decent work, consumption and production, quality education and finally peace and healthy society with interconnectivity, interoperability and networking.

The system is designed in the same direction up-to a certain level to measure the volume of work / contributions done by Higher Education Systems in any country so far. We can also say that this is a kind of very initiative pertaining to "Assessments of Higher Education's progress towards the UN Sustainable Development Goals". The system will defenitely be a fruitful initiative in perspective of UN-SDGs with features of data analytics, frequently release of updated data dashboard and will also be a source of data service provider to all concerned.

The system has mainly identified three types of users; 1) Contributors (each private and govt. funded Higher Education Institutions), 2) Beneficiaries (audience)/stakeholders: urban and rural people, researchers, Ministerial level associates, Institutional level associates and the UN level associates and, 3) people who will look after the activities of recruitment, procurement, meetings, development, testing, deployment, and maintenance of system and analyzing informational resource acquired and placing them to the above-mentioned beneficiaries/stakeholders.

A core group of the project will invite to a nodal person considering as a contributor from each Higher Education Institution either government or privately funded, across the country. The core group will invite them to register their Institutions on the system and to create a login credential. Each registration will finally be authenticated and finally be approved by the core group.

Now the system will allow each contributor (a nodal person and their associates) to store short summary outcome based on academic and research knowledge-based information resources, innovative stuffs, best practices, framework and policy documents and case studies carried-out in association with the SDGs and they will attach hyperlink to each document if the document is already published elsewhere, and will map each document with the appropriate UN SD goal and target (this will enable us to track and better understand which goals received the most and least attention in the Institution and country as whole). Each record will also have some additional fields to capture outcome–based digital information (numbers). Each contributor will also store human resource data (such as people are engaged in jobs for implementing the SDGs, people are empowered through academic or vocational trainings and young people who are mobilized in an area of SDGs and also inclusive network partners) and their engagements in the appropriate SD goals and targets. The system will also have a provision to allow each contributor to upload academic and research knowledge-based information resources, innovative stuffs, best practices, framework and policy documents and the case studies carried-out associated with the SDGs in the form of multimedia formats, if those information are not yet published elsewhere.

Once the system will take a considerable shape, the data analytics process will start to assessing the contributions made and outcomes of 17 SDGs and their targets made so far through Higher Education Systems. The system will attempt to store information (Institutional, goal and target wise). Initially the system has proposed/identified to capture information of the following categories: SDGs Framework and Policy, Case Study, Thesis and Dissertation, Innovative and outcome-based students Project Report, Conference Proceedings, Journals, Books Chapters, Books, Monographs, Editorials, Patents & Copyrights (just outcomes and commercial values), best practices adopted, Innovative ideas (outcomes of the ongoing and completed sponsored Research and Consulting Projects), Course Materials & Lectures (including audio and video), Social Impact-Driven Projects, SDGs based various academic and research programmes, Pedagogy (how sustainable development being taught, researched, and promoted by universities/colleges/institutions), Teachers Capacity building in perspective of SDGs, Providing opportunity for youth engagement, Empowering and mobilizing local people, Institute graduates engagement in SDGs, Inclusive network partners

Then the metrics and numbers (in context of real-world sustainability impact) on the dashboard will be provided at the Institutional and Ministerial levels and also for the UN representatives and for the urban and rural people of the country and finally for the researchers (visualizing and interpreting of results). The updated version of the data on the dashboard will be released on quarterly or half yearly basis every year. Other stakeholders (faculty, students, researchers, innovators, entrepreneurs, Institutions, Employers, Industries, Research Laboratories, common Urban and Rural People) will also receive regular benefits from the system.

Based on the outcomes and data analytics, the system will have a provision to suggest some strategies and planning pertaining improvement in the existing teaching, learning and pedagogy practices and employability in case of a shortfall observed institution-wise as well as country as a whole in the Higher Education Systems as evidence to further strengthen the real-world sustainability impact. The system will also have a provision of further encouraging teaching Sustainable Development across all the disciplines, research and dissemination of Sustainable Development knowledge, green campus etc.
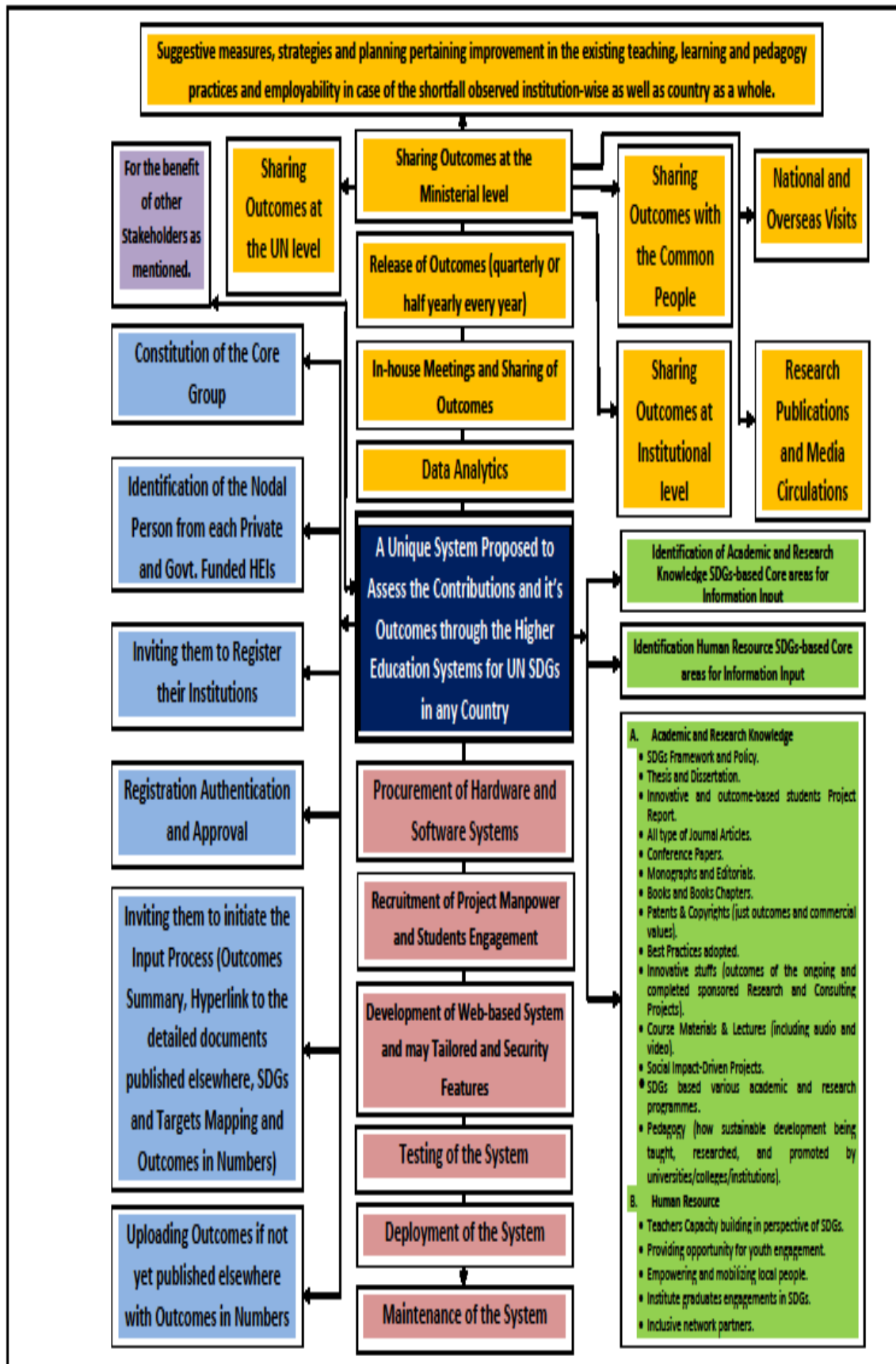
The said project will definetly serve as a potential project for all faculty, students, researchers, innovators, entrepreneurs, Institutions, Employers, Industries, Research Laboratories, common Urban and Rural People in terms of learning, adopting best practices, seeking help in their research from inter-linked exploration from multidimensional information resource and finally for the UN representatives in terms of 17th UN SDGs and at the Ministerial and Institutional level in terms of progress of Higher Education Systems in the area of UN-SDGs. This system will have an integrated set of services for capturing, cataloging, storing, searching, protecting and convenient access. The system will also build a bridge between the Science-Society, Engineering-Society and Science-Engineering. The system will be considered innovative in the sense of product innovation, process innovation, audience innovation, technology innovation. The system will cover the following academic domains; Social Science, Earth and Agriculture Sciences, Computer Science, Natural Sciences, Biomedical Science, Medicine & Medical Sciences, Law, Architecture & Regional Planning, Business Management and other socially relevant Engineering, Science and Social Sciences.The system will also have many security and authenticity features. The system will also have many tailored based features. The system will be considered as an on-going process of evolution knowledge and information resource and will not stop at any one point. But evolution of information resource into a considerable shape, a minimum time of three years will be required. This will include procurement, recruitment, development, testing, deployment and the uploading of knowledge based information resources and human resource data its hihest extent.

In the first year, normally, a process of procurements, recruitments, development, testing and deployment will begin. In the 2nd year, the system will invite contributors (from all Institutions across the country) to register themselves. The creation of login credentials will begin for the Institutions and upon validation, the system will allow each contributor across the Institutions to initiate uploading of knowledge based information resources and human resource data and finally, in the 3rd year onwards the system will begin data analytics process and simultaneously the system will also allow each contributor to continue the data uploading process.

The project will have a provision to involve some students to work within the system through-out the project life cycle. Based on the research and outcomes pertaining to this project, there will be initiatives to publish some research papers in the journals, newspapers or in other public sources. The system will provide a unique interface between the Institutions and policy makers, for the Ministry, UN representatives and for the common people and researchers.

The project will definitely be scalable and very applicable.

A Framework for Novel System, Method and Perspective Plan Proposed (A set of activities in different colors categorizing the system boundary at the 1st phase and on later may further be expanded)

Suggestive measures, strategies and planning pertaining improvement in the existing teaching, learning and pedagogy practices and employability in case of the shortfall observed institution-wise as well as country as a whole.

For the benefit of other Stakeholders as mentioned.

Sharing Outcomes at the UN level

Sharing Outcomes at the Ministerial level

Sharing Outcomes with the Common People

National and Overseas Visits

Release of Outcomes (quarterly or half yearly every year)

Constitution of the Core Group

In-house Meetings and Sharing of Outcomes

Sharing Outcomes at Institutional level

Research Publications and Media Circulations

Identification of the Nodal Person from each Private and Govt. Funded HEIs

Data Analytics

A Unique System Proposed to Assess the Contributions and it's Outcomes through the Higher Education Systems for UN SDGs in any Country

Identification of Academic and Research Knowledge SDGs-based Core areas for Information Input

Inviting them to Register their Institutions

Identification Human Resource SDGs-based Core areas for Information Input

Registration Authentication and Approval

Procurement of Hardware and Software Systems

A. **Academic and Research Knowledge**
- SDGs Framework and Policy.
- Thesis and Dissertation.
- Innovative and outcome-based students Project Report.
- All type of Journal Articles.
- Conference Papers.
- Monographs and Editorials.
- Books and Books Chapters.
- Patents & Copyrights (just outcomes and commercial values).
- Best Practices adopted.
- Innovative stuffs (outcomes of the ongoing and completed sponsored Research and Consulting Projects).
- Course Materials & Lectures (including audio and video).
- Social Impact-Driven Projects.
- SDGs based various academic and research programmes.
- Pedagogy (how sustainable development being taught, researched, and promoted by universities/colleges/institutions).

B. **Human Resource**
- Teachers Capacity building in perspective of SDGs.
- Providing opportunity for youth engagement.
- Empowering and mobilizing local people.
- Institute graduates engagements in SDGs.
- Inclusive network partners.

Recruitment of Project Manpower and Students Engagement

Inviting them to initiate the Input Process (Outcomes Summary, Hyperlink to the detailed documents published elsewhere, SDGs and Targets Mapping and Outcomes in Numbers)

Development of Web-based System and may Tailored and Security Features

Testing of the System

Deployment of the System

Uploading Outcomes if not yet published elsewhere with Outcomes in Numbers

Maintenance of the System

Project Budget Cost (Based on INR and for India period for 36 months)

Approx 2 crores including manpower, software and hardware requirements, other accessories contingencies, travel cost and consumables.

Manpower Requirements Suggested

Following, manpower requirements have been suggested: Head of the Project, Associate Heads, System and Application Manager (one), experienced Back-end Developer (one), experienced Front-end Developer (two), supporting Staff (two) and one to two student(s) participation always throughout the project

Software and Hardware Requirements and Specifications

Following hardware requirements have been suggested: High Configuration and Data Storage Server – two, High Configuration Desktop PC – three, 3-in-1 Laser Jet Printer – two, High Configuration Laptop – one, UPS 30 KVA – one, Online StorageWork – two, other Accessories, OS: Linux and LAMP Stack Open Source

Results and Discussion

Education is considered an integral element for Sustainable Development and Sustainable Development Goal (SDG) 4 on quality education is a key enabler for all other SDGs., roles and responsibilities of the Higher Education Systems is vital now. All Higher Educational Institutions must consider it their roles and responsibilities to deal intensively with sustainable development issues, to foster the development of sustainability competencies and to develop the specific learning outcomes. Therefore, it is vital not only to include SDG-related contents in the curricula, but also to use action-oriented transformative pedagogy, teachers capacity building in perspective of SDGs, human resource engagements (providing an opportunity for youth engagements, empowering and mobilizing local people, Institute graduates engagements in SDGs, carrying-out research & innovation and socially driven-impact projects, best practices, case studies, new courses and academic programmes offering, formulation of new policy documents, and also to build a inclusive network partners). Therefore, educational officials, policy-makers, educators, curriculum developers and others are also called upon, to rethink education in order to contribute to the achievement of the SDGs. Keeping in mind this, a novel system, method and perspective plan is proposed in the form of a project in this paper and this is a really fruitful initiative to regularly assess contributions and outcomes through Higher Education Systems in any country. The system will also do some regular data analytics and will prepare, release and share quarterly/half yearly data on the dashboard with different stakeholders as it has been mentioned above, as much as possible, based on ongoing process of information being captured and the system will finally become a knowledge hub and a data service provider for different stakeholders.

Limitation of Study

Will think further on areas which have been left behind and will incorporate them within the system. This will depend on time we consume to excerise this task. Once the considerable information resources have been made accessible during the regular data analytics process, some new ideas will also immerge and will defenitely be translated them into a form of additional features within the system and simullarly will also populate additional statistics.

Acknowledgement and Conflict of Interest

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