

## **Digitization for a sustainable and inclusive development**

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### **Abstract**

The SDGs were set in the year 2015, with the target period for achieving these goals at the end of the year 2030. The 17 goals are universal in nature and are interdependent. Every year, all countries report on their progress toward the SDGs. The role of science and technology in achieving the SDG will leave no one behind. Science, technology, and innovation are the keys to SDG progress. It provides a smarter solution to the problem and encourages evidence based policy making. The achievement of the SDG target cannot be left solely to policymakers. It can be made achievable by establishing think tanks, research and development, academia-industry collaboration, discussion between science and society, etc. The outbreak of COVID-19 has pushed back sustainable goals. Use of technology and innovation can help in achieving these goals. It will help us to achieve national goals, which in turn will help to achieve the goals set out in the SDGs. The paper examines the contribution of science and technology in achieving these goals.

**Purpose:** The Purpose of the paper is to address achievement of the sustainable goals is the real aim of the education.

**Research Methodology:** Empirical and exploratory research methodology is used to analyse the topic.

**Key finding:** Private and public partnership is required for achievement of these goals. Frugal technology and innovation can help a country to achieve these SDGs by the end of the year 2030.

**Implications:** It applies for all the nations to act in an interdependent way to achieve these goals.

**Originality:** Views and suggestions regarding change in policy making, and inclusion of SDGs in national budget, increase in expenditure on research and development is given.

**Key words:** SDGs, Technology, Research and Development, GDP, innovation

### **Introduction**

Sustainable development goals are universal in nature, and all countries set their national goals to achieve the goals set by the United Nations for SDGs. The target period for the achievement of these goals is 2030. But the sudden outbreak of

COVID-19 has disturbed the progress of the achievement of these goals. According to an IMF projection, the world economy will go down by more than 4% by the end of 2020. According to the Global Economic Prospects Report, global growth is expected to go down from 5.5% in 2021 to 4.1% in 2022 and 3.2% in 2023. Amidst the pandemic, it was only through science and technology that students were educated, businesses were managed, work from home was done, health services were provided, and national and international conferences were organised. Had the technology not been there, there would have been a complete mess in the system. The various STG goals are interrelated and, through technology and innovations, such goals can be achieved, especially during the pandemic period. The invention of the vaccine helped the world to control the spread of COVID-19. E-health services helped in providing medical facilities to chronic patients. Robots were used to treat patients suffering from COVID-19. The world is marching towards an industrial revolution 4.0, where technology will be used in industries. Tesla has made driverless cars using artificial intelligence. According to the World Bank report, factories in China will have the most industrial robots in the world by 2018. With the use of technology, the current job scenario will change, but if it is ignored, the business will be outdated and all the employees will become jobless.

### **Review of literature**

SDGs cannot be met only by making policies, research can help countries to achieve SDGs (editorials of journal Nature 2021). Use of technology can help in achieving SDG's Imaz, M. and Sheinbaum, C. (2017). China SDG index score has increased at national level from the year 2000 to 2015 as China is advancing in technology ( Xu, Z., Chau, S.N., Chen, X. Et.al 2020). Artificial intelligence based technologies can help in achieving SDGs it should be supported by transparency, safety and ethical standards (Ricardo Vinuesa <sup>1 \*</sup>, Hossein Azizpour <sup>2</sup>, Iolanda Leite<sup>2</sup>, Madeline Balaam<sup>3</sup>, Virginia Dignum<sup>4</sup>, Sami Domisch <sup>5</sup>, Anna Felländer<sup>6</sup>, Simone Daniela Langhans<sup>7,8</sup>, Max Tegmark<sup>9</sup> & Francesco Fuso Nerini <sup>10\*</sup>2020). India is distinctively competent in frugal innovation. It can solve its problem by developing innovations that help in solving its problems (Rishiksha Krishnan and N Dayasindhu 2021); Digitisation is boon for achievement of sustainable goals, it helps in building sustainable societies (Maria E. Mondejar <sup>a</sup>, Ram Avtar <sup>b</sup>, Heyker Lellani Baños Diaz <sup>c</sup>, Rama Kant Dubey <sup>d,e</sup>, Jesús Esteban <sup>f</sup>, Abigail Gómez-Morales <sup>g</sup>, Brett Hallam <sup>h</sup>, Nsilulu Tresor Mbungu <sup>i,j,k</sup>, Chukwuebuka Christopher Okolo <sup>l,m</sup>, Kumar Arun Prasad <sup>n</sup>, Qianhong She <sup>o,p</sup>, Sergi Garcia-Segura <sup>q</sup>, \* 2021). Environment sustainability can be achieved with the help of green technology, innovation and renewable energy ( Shan Shan <sup>a,\*</sup>, Sema Yılmaz Genç <sup>b</sup>, Hafiz Waqas Kamran <sup>c</sup>, Gheorghita Dinca <sup>d</sup>; 2021), Technology and innovation can help in achieving goals of SDGs by 2030 but it has challenges also (ShunsukeManagi<sup>a</sup>RobertLindner<sup>b</sup>Casey C.Stevens<sup>c</sup> 2021). Information and communication Technology can help in building smart cities (Daielly Melina Nassif\_Mantovani Ribeiro\_Flavio\_Hourneaux Junior\_Cristiana Lara\_Lara Cunha\_Patricia Taeko\_Kaetsu\_Patricia Fernanda\_Dionizio-Leite\_Celso\_Machado Junior 2021); Innovation and technology helped in achieving in cost effective healthcare developments and research opportunities in China, India and Singapore (Johen Wirtz,Chen Lin, and Gopal Das 2022). Technology can bring more efficiency and less pollution in agriculture but its repair cost is very high (Kayleigh Bateman 2022).

### **Research Gap**

Development in science and technology can help in achieving sustainable goals, which is evident from a review of literature, but sharing such knowledge with the rest of the world can truly bring change. All SDGs are framed so that no country is left

behind in achieving them by the end of the year 2030. The paper outlines how research and development in one country can bring change in other countries.

### **The Objective of the Study**

1. To study how digitisation can contribute to the achievement of sustainable goals.

### **Source of Information**

Secondary sources of information are used from journals, books, websites, reports etc.

### **Research Methodology**

Empirical and explorative research tools were used to study the problem. Developments in other countries were observed to find ways to achieve sustainable goals.

### **Use of digitisation in Achieving SDGs**

For the development of any country, it is crucial to know how much a country is spending on research and technology. According to the World Sustainability Report on SDGs, the percentage of expenditure on research and development in India was 0.7% of GDP in the year 2018, China 2.2%, and the USA 2.8%. According to the global report on SDGs, India is in 120th place out of 169 countries; its SDG index score is 60.1. India stands on the E-government development index at 0.60, the internet freedom score at 51, and cyber security at 0.72. 10–15% of GDP is required to be invested by low-income developing countries in order to achieve SDG's. During COVID-19, it was found that technology has become a necessity for good public health, teaching, working from home, official meetings etc. This has increased the need for development in the fields of innovation and technology to face such disasters.

A digital revolution is required in every field, such as trade, health, education, agriculture, media and public administration. It helps in increasing productivity, efficient business, good governance, etc. As per the global report on SDGs, the SDG index in various aspects has gone down as compared to last year due to the outbreak of global pandemic COVID-19. Countries with high incomes, however, can recover quickly, but low-income countries have to work hard to overcome the bad effects of the pandemic. The development of indigenous innovation can solve many problems for an individual country.

There are 17 SDGs where innovation and technology can play a very important role in achieving them by the end of 2030.

1. **Eradicating poverty-** Poverty is a global problem. It deprives human beings from basic facilities like food, clothing, and shelter and is the root cause of many crimes. Countries facing such problems cannot be left alone to fight their problems. Research and technology in one nation can be transferred to another to combat such issues. Use of technology improves agriculture production, affordable education, affordable housing, etc. Digitisation promotes financial inclusion, which in turn promotes direct transfer benefits to individuals. It thus stops the filtration of cash. 3D printed affordable homes can solve the problem of homes for the poor. Free online digital

portals for free education and the availability of e-books can aid in increasing literacy rates, which in turn aid in the abolition of poverty.

2. **Eradicate Hunger:** With the increase in the population, there is a global need for food and improved nutrition. The population of the world is expected to 9.7 billion by the end of 2050. We need to double the food production to feed the population by that time. Technology can be used to check soil, weather conditions, and improve a variety of crops. Remote sensing and GIS technology can be used for sustainable management of agriculture and land. It can also warn about any disease outbreak or insect attack. Robots can work in the seedbed, grounding, irrigation, plucking fruits, pruning, harvesting, etc. and work in any temperature. Drones can be used to monitor crops and for fertilisation of crops. Automated tractors can be used for the harvesting of crops. Driverless electric tractor can work in any weather which will reduce pollution and increase efficiency. It will make farming more sustainable, there will be less crop damage and more food will be available.
3. **Good health and well-being:** E-health can provide sound advice to patients even in the most remote locations. It is also beneficial to the patient that all the history of the patients is recorded on the E-health card. Online booking of hospitals, online monitoring of reports and advice can provide health services to a major portion of the population. Use of technology can help in the early detection of problems. Robotic surgery and the use of artificial intelligence in drug development are some of the examples where technology is used in medical science to provide good health and well-being.
4. **Quality education:** Education is an important parameter to check the quality of life people are living. Knowledge about writing, reading, and basic knowledge of technology helps a person perform their functions better. Such people can transact digitally, understand the banking system, and can take better financial decisions. Use of technology and digitisation of services requires a basic understanding of the work. Therefore, quality education is important in every country. Technology can be used for online teaching by providing online courses, online exams, digital libraries, online conferences, and online meetings. During COVID-19, technology was seen as a vital tool to impart education. Digital education can provide a world class education. The use of RFID technology entirely changed how books were managed in libraries.
5. **Gender equality:** Women constitute around half of the population, but they are not actively included in the main workforce. The societal mindset requires change to consider and accept women as leaders. Labour policies and work policies must include the online work, by women. It will help them to include women in the workforce, and women can take care of their family members also. Their contribution to science and technology must be encouraged and promoted so that they can also innovate using science and technology. Digitisation is providing a forum where women can discuss and share their experiences. The Women entrepreneurship forum helped women to become entrepreneurs. Online access to legal services empowers women to take the right decisions. Some of the safety apps, like Safetipin, provide features such as GPS tracking, emergency contact numbers, and directions to safe locations. In a similar way, many other apps such as Himmat, Women's Safety, Smart24\*7, Shake to Safety, B Safe, etc., provide confidence in women to come out of their homes and contribute to economic activities. Providing an online portal by the Ministry of Women and Child Development (<http://www.shebox.nic.in/>) for complaints about sexual harassment of women at workplaces gives women the strength to work outside and earn money.
6. **Clean water and sanitation:** Clean water and sanitation are two of the biggest problems in the world. The increase in population and the cutting of forest for agriculture and housing has disturbed the water level under the ground. The problem of clean water and sanitation also causes many diseases and leads to health crises. Solar powered water filtration, desalination engineering, rainwater harvesting, and

watershed management are some of the techniques that can be used for water conservation and the availability of clean water. A Drinkwell is a water ATM used in India and Bangladesh to provide clean water in arsenic and fluoride-affected communities through patented filtration technology. Fluid robotics is used in India to detect leakage in water distribution systems. Use of such innovative technologies can help in cleaning water and sanitation.

7. **Affordable and clean energy:** 22 cities in India are among the 30 most polluted cities in the world. Use of solar energy, hydropower, wind energy, and electric vehicles can help in maintaining affordable and clean energy. Solar power generation grew 22% in 2019 and is the cheapest source of electricity. Electric cycles and CNG buses help in minimising environmental pollution. Use of digitisation helps in a clean energy system. Digital payments and the use of renewable energy can both contribute to this goal. A reservoir in the Swiss Alps is the world's highest floating farm for generation of solar energy. In India, canals are being turned into solar farms to save land for living and farming. A floating solar farm at a high altitude can provide more electricity. India is densely populated, but it has a major canal system. This can be used to generate solar energy. Building smart cities with zero carbon can help in controlling pollution.
8. **Decent work and economic growth:** There shall be minimum wages; buy from green companies which give equal opportunity to all. Digitisation has provided jobs for many, from insurance companies to various financial services providers and transportation services, all are connected through logistics. It provides jobs without a heavy initial investment. Skill development plans also provide desired skills to the needy.
9. **Industry innovation and infrastructure-** Research and development expenditure of GDP and researchers in full time per million inhabitants. Digitisation has changed the way business is done. At the time of the Corona pandemic, e-commerce and m-commerce have given life to businesses. Online payment systems and access to goods have made it easier for consumers to buy products. Radio taxi, online service providers like booking of hotels, travel and tour plans, and online ordering of food. Industrial Revolution 4.0: the use of artificial intelligence in factories. It will lead to more efficiency and fewer chances of errors. It also changes the future way of living where artificial intelligence will play a dominant role in daily life.
10. **Reduce inequalities:** E-governance and digitisation provide access to services to all, irrespective of income, wealth, and power. Logging into e-portals provides access to all information. Online filing of complaints and tracking it, payment of utility bills online, online admission to educational institution etc. has made life easy for ordinary people. Giving identity to all individuals by making aadhaar card has also helped in reducing inequality.
11. **Sustainable cities and communities:** Technology can be used to make cities sustainable. Use of electric vehicles, e-bikes and electric public transport can reduce pollution in the cities. Development of social portals like tarahaat.com can provide a solution to many problems at a local level. It is a social portal in rural villages in the local language that provides services such as education and social and economic information.
12. **Responsible production and consumption:** This goal is concerned with protection of environment with economic growth. The population of the world will be 9.6 billion by 2050. We need more food to feed increasing population. At the same time we have limited resources. It is important to control pollution, degradation of soil and give emphasis on sustainable energy, green infrastructure etc. India is the 3<sup>rd</sup> largest greenhouse gas emitter i.e 6.9% and only 19.9% of urban waste is processed. With the help of technology food production can be enhanced, pollution can be controlled. Information and communication technology can help in use of technology in agriculture, transportation and in supply chain management. Technology has given alternate uses for plastic and help with responsible production and consumption.

Sustainable development goals have become an integral part of the strategy making of every company.

13. **Climate change:** Technology helps in providing weather forecasts and forecasting disasters. Electric flights, running on empty, enable machinery to automatically decrease energy consumption when power is not required, e.g., escalators when passengers are not required. Google searches on glaciers, desertification, and deforestation will also help in predicting climatic problems in advance and taking suitable actions.
14. **Life below water:** Technology is also used to reconstruct marine life where man has caused disasters. Mapping and monitoring of protected and natural areas, monitoring of illegal fisheries, assessment and monitoring of marine and coastal resources can be done with the help of technology. NASA satellites monitor the earth's gravity field. It thus helps in taking care of life below water.
15. **Life on land: The use** of technology has changed life on earth. Smart phones have changed the way we live. It can be used for many purposes. Whatsapp can connect us to anyone living in any part of the world. A phone can provide us with many facilities. The use of technology in the conservation of the environment and natural resources has also helped in making life better on land. Weather monitoring, including the use of weather forecast maps and other tools, Use of Google maps, high resolution satellite images, and use of, global satellite navigation services has helped us in making our life better on land.
16. **Peace, justice, and strong institutions-** E-courts and filing RTI online have strengthened the system of peace and justice. The legalisation of crypto currency, cyber laws, and the use of block chains has all improved the way we do our work. Artificial intelligence and machine learning can be used to control discrimination at the workplace.
17. **Partnership is the goal.**

For the achievement of the 16 SDGs, it is important that there be global partnership. The countries that are advanced and developed are required to help the developing and poor countries so that, with mutual cooperation, all countries can achieve the SDGs. During the pandemic, COVID-19 developed nations and those who invented low-cost vaccines exported them to the poor countries free of charge. That shows how countries can help each other face such disasters. Transfer of the latest developments to the least developed nations can bring welfare to all. There should be an effective public and private partnership in the field of innovation and the development of technology.

## **Conclusion**

The goal of education must be to achieve the SDGs so that benefit is given to all and no one is left behind in achieving all 17 goals. Countries make national goals in the light of SDGs so that they can achieve these goals by the end of 2030. Investment in this field will necessitate public-private partnerships, which will aid in the achievement of the SDGs. Developed and rich countries must assist poor and developing countries in the transfer of their research and innovation so that it can be used for development and the achievement of the SDGs by all countries. Frugal innovation must be strengthened so that countries can solve their own problems. We further need to include SDG's in the national budget. The various policies of work need to be amended. To include women and other excluded minorities, work from home should be allowed. The use of technology and innovation needs to be strengthened. Societal viewpoints on the ideal picture of a woman need to be changed so that more women can enter the field of science and technology and contribute to innovation. The repair

cost of technology driven vehicles in agriculture will outweigh its benefits. Therefore solution of problem in one country may not be a correct option for other country. To overcome country specific problems use of local technology addressing specific solution of the problem must be encouraged. Countries must increase their spending (percentage of GDP) on research and development and on education.

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