

**Strategies for Sustainable Design**  
**Professor Doctor Shiva Ji**  
**Indian Institute of Technology, Hyderabad**  
**Lecture 28**

**UN SDG for Sustainable Development**

Hello everyone, in this lecture we will discuss about UN sustainable development goals for sustainable development.

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So, you may have seen these color patches already, these are total 17 in number and they have been given these color codes and they have been given a dedicated number like 1, 2, 3, 4 up to like 17 they have representative graphic for all of these 17 SDG and they are, they come in like this spectrum, they come in this color combination, you can see over here and they form a complete circle, so in itself it gives this notion, this idea of completeness having a complete and a sensible sustainable system by incorporating, by addressing all of these concerns.

And majorly if you see in today's world there are three aspects of sustainability that we have already studied environmental, social and economical and under these there are several types of issues for example, there are issues of poverty, hunger, the fresh supply of water, fresh supply of air, roofing, maybe a place of respectable place of habitation, opportunity for like education, opportunity for health services, sanitation, opportunity for

growth and development to be part of the entire mainstream of the society, the science and technological advancement.

So, there all these sorts of concerns wherever there are any sorts of concerns on ESB, ESE aspects those are somewhere they have found a mention in all of these 17 SDG so these 17 SDG are the boost comprehensive sets of sustainable development goals which are capable of serving the smaller and bigger objectives of sustainability and in and around like on the ESE aspects. So, we will discuss these goals in detail in the coming slides.

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So if you see over here, so these for example, the first one starts with the no poverty, so of course, a huge number of population from most of the countries mainly in the Asian countries, African and the Latin American countries is still fighting for a good life, so those are the people who can be considered as the poor people and there is a line you may have heard of below poverty line BPL.

So, there is a significant number of population which still lives below that BPL and all of this (3:08) growth and development and the advancement does not makes any sense, if the humanity at large is not able to feed or take care of the its own species, its own

brothers and sisters from across like the world all of this growth and development makes like no sense.

So, the first and foremost is the like eradication of the poverty because of the poverty there are all sorts of other issues also arise and for example, the family of that person they may not be able to afford a good food, they may not be able to fend for like he is a daily survival, he may not be able to provide class for the family or himself, he may not be able to give the opportunity of education or even basic things like health services, so this poverty is very, very bad, very detrimental and it is traumatic situation for the entire humanity to think upon and work for improvement of the conditions of a sizable number of like our own number of people.

And then the second is 0 hunger, so one must strive to feed at least be able to feed himself, herself or the family members, so this 0 hunger comes like the second, this is also one of the most important areas where a significant improvement is needed, we are all aware of there are still number of people who are a very weak in on the economical terms and they find it very hard to receive meals, at least two meals per day, so one should never die because of this hunger, so there are several schemes started by international agencies particularly our the Central Government and State Governments to feed these many people.

So, there should be consistent and permanent solution for such situation, so by solving the first one we may be able to solve this second one also and that is where they are interrelated, so these two have found the prominent place because as a civilization, as the human species we cannot say we have evolved unless we are not able to solve like these two the most, the foremost and the prime requirement of being just live on this planet.

Third one is to take care of the good health and well-being, the fourth one talks about quality education, gender equality, clean water and sanitation. So, there you can see on the top these are all very basic human requirements of living in a good condition, working in a good condition, at least getting to receive a respectable knowledge and education so that one can empower himself and herself for future, for the livelihood, for working (6:09) professional lives.

Well gender equality this issue also has been persistently there in several of the countries, you may be aware the fairer gender has not even been given with the voting powers till recently in many of the countries, they do not have the rights to drive vehicles alone, they do not have rights to go to the restaurants or like public places alone, so such things are very detrimental for us as humans, some of the religions and cultures they follow a very pessimistic approach towards like the fairer gender and they are not, they cannot be called just.

So, in the recent times some of the State Governments and our like Indian Central Government has taken steps to abolish those demeaning practices from the older times, from ancient times and move on to the new era of advancement and equality. So, this is one of the important factors over here and that is why it has found a place in the UN SDG. Further clean water and sanitation, well this is also one of the most basic necessities, unless we do not drink clean water there are chances that the person may catch several diseases and other issues.

So, there are several you may be aware already, there are several types of diseases which arises just out of the bad or not fit for the consumption water. So, this water borne diseases must be solved by first of all providing the fresh water and portable water in the quality water which is hygienic and clean etcetera.

Moving on, we have this seventh one, affordable and clean energy, then we have decent work and economy growth, then we have our industry, innovation, infrastructure, reduced inequalities, we have sustainable cities and communities, we have responsible consumption and production.

So, in this range if you see this from 7 to 12 we have focus on clean energy system, we have focus on the justified and equalized economic growth model, we have innovation and we have emphasis on infrastructure, we have again talked about abolishing inequalities in the society, inequalities in the community, we have talking about the sustainable cities and sustainable communities, we are talking about consumption and responsible production system.

So, these are all have to do a lot with all the aspects of sustainability whether it is environmental, social or economical for better future. Further, we have a very top level approaches regarding the climate action, we have concern, we have shown some concern for life below water, there are thousands and millions of species living in the water bodies, whether it is small lake or maybe a river, maybe oceans. So, we must take care of these beings also, we must take care of the living beings who are living on the land, birds, animals and other like life forms.

And then we have 16 point of peace, justice and strong institutions, then finally we have partnerships for the goal. Well nothing we can do alone or in isolation, we must fight all of these goals, all of these challenges together because in the company, in the unity there is a force, if somebody has certain advantage if the some other person has certain advantages if they are both come together they can have the actual multiplication of that the both distinct advantages and that is how the society can grow (10:05) fold.

In the recent times when the globalization process has begun, so there is a support happening on the exchange of economic, social community and educational and research activities also, there is so much of exchange happening at the world level, the companies and institutions are collaborating, the governments are also promoting collaboration between the research and academic institutions, collaboration between the companies for monetary as well as technology exchanges etcetera and all that. So, all of these things if they come together, all of the stakeholders if they come together, so all of these sustainable developments are not that hard to achieve.

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## #Envision2030 Goal 1: No Poverty

- By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day.
- By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.
- Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.
- By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including micro-finance.
- 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.
- Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions.
- Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions



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Dr. Shiva A  
IIT Hyderabad, India



So, further what is the goal, what is the vision about this thing regarding the first SDG which we have spoken of, so envision like 2030, by 2030 eradicate extreme poverty of all people everywhere currently measured as people living on less than 1.25 dollars per day. So, this is a target which has been set by these United Nations to achieve this target in the next, by the year of 2030, so that every person living on this planet must be able to earn a livelihood of like 1.25 dollars per day, so that he can at least live a minimum standard of life.

By 2030 reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions. Next, implement nationally appropriate social protection systems and measures for all including floors and by 2030 achieve substantial coverage of the poor and the vulnerable. Further, by 2030 ensure that all men and women, in particular the poor and the vulnerable have equal rights in economic resources as well as access to basic services, ownership and control over land and other forms of property like inheritance, natural resources, appropriate new technology and financial services, including microfinance.

So, this talks about sharing of resources, this talks about sharing of the property, talks about a sharing of the new technology, sharing of the financial services including like microfinance systems etcetera. So, it talks about sharing opportunities of growth and

development in the individual's life, in the life of the household which is a very important and crucial for the overall growth, which they can observe over the period of time.

Further, 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. So, this talks about the effects which could be possible through these degradation in these ESE aspects, so one must take care of those vulnerable situations or the criticalities which may arrive, so we must work to create a resilient model of development, so that we can take care of ourselves in those extreme situations.

Further, next point is ensuring significant mobilization of resources from a variety of sources including through enhanced developed cooperation in order to provide adequate and predictable means for developing countries, in particular least developed countries to implement programs and policies to end poverty in all its dimensions. Further, create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender sensitive development strategies to support accelerated investment in property eradication actions.

So, if you see this goal talks about a wholesome approach ranging from national, regional and local levels, ranging from gender sensitive issues, ranging from poverty eradication issues and etcetera and accordingly the agencies and the governments can frame actionable points.

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The infographic is titled "Ending poverty and hunger for all persons with disabilities" and is part of a presentation by NPTEL. It features the following content:

- SDG Goals:** Sustainable Development Goals Goal 1: End poverty in all its forms and Goal 2: End hunger.
- Convention on the Rights of Persons with Disabilities:** Article 28: Right to control financial affairs and equal access to bank loans; Article 27: Opportunity to gain a living by work freely chosen or accepted; Article 26: Right to social protection and access to poverty reduction programmes.
- Statistics:**
  - Up to twice as many persons with disabilities live under the poverty line than persons without disabilities.
  - In some countries, persons with disabilities find that 25% of banks are not accessible.
  - In some countries, over 80% of persons with disabilities who need welfare services cannot receive them.
- Actions to end poverty and hunger for all persons with disabilities:**
  - Design or redesign social protection policies and programmes to include persons with disabilities.
  - Remove barriers that persons with disabilities face in accessing and benefiting from social protection or welfare benefits with others.
  - Eliminate structural or gross effects about barriers experienced by persons with disabilities.
  - Improve access to and accountability of banking and other financial services.
  - Develop and disseminate and improve the quality index.
  - Periodically assess all social protection programmes regarding inclusion and impact.

At the bottom, it includes the NPTEL logo, the text "Week 1: Definitions and Perspectives on Sustainability in Industrial Design and Built Environments", "Lecture 4: Technological interventions into building design", and the presenter's name "Dr. Shiva J. IT Hyderabad, India".

Next to this you can see and this graphic over here, this talks about ending poverty and hunger for all persons with disabilities. So, particularly this is talking about the people with the disabilities, so there are these two SDG you can see over here, those are displayed over here, so these are the first and two ending poverty and ending hunger, so this is a specific focus for people with disabilities because they are a group of people who are more prone, they are more vulnerable to both of these conditions because they are not physically fit enough for a meeting several requirements as we have in the everyday life.

So, they must be, this group of people must be receiving some special attention, so that they cannot fall prey to these two situations. So, there are conventions and undertaken on this objective, so the convention on the rights and persons with the disabilities so the article 12 talks about right to control financial affairs and equal access to bank loans, you know mortgages and other forms of financial credits. So, these set of people are also equally deserving for such financial helps and assistance is available from financial institutions.

Article 27 talks about opportunity to gain a living by work freely chosen or accepted, article 28 talks about right to social protection and access to poverty reduction programmes. So, in this one you can see there are conventions placed in the provision, so that these sections is not left out. Up to twice as many persons with disabilities live under the



poverty line than persons without disabilities, so well this is the reason why this focus is given particularly to this set of like people, in some countries persons with disabilities find that 30 percent of banks are not accessible to them. So, this is one of the limitations, one of the challenges, additional challenges they face by being disabled person, being especially abled person, they do not get the equal access to such services.

Further, if you see in some countries over 80 percent of persons with disabilities who need welfare services cannot receive them. So, these are indicators from our society, from our different countries, which gives a glimpse like how vulnerable, how prone this group is on these are two considerations.

So, the actions needed to end poverty and hunger for all persons with disabilities, so design or redesign social protection policies and programs to include persons with disabilities, remove barriers that persons with disabilities face in accessing and benefiting from social protection on an equal basis with others, sensitize personal of grant offices about barriers experienced by persons with disabilities, improve access to and accessibility of banking and other financial services, disaggregate data on poverty and hunger by disability status and periodically access all social protection programs regarding inclusion and impact. So, these are action points recommended by United Nations particularly for these groups of people to solve these two sustainable development goals.

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## #Envision2030 Goal 2: Zero Hunger

- 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.
- 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
- By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment
- By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality
- By 2030, 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
- 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 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
- Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility



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Dr. Shiva J.  
IIT Hyderabad, India



We will see next about like zero hunger, so what are the points in the envision 2030? By 2030 end hunger and ensure access by all people, in particular the poor and the people in vulnerable situations, including infants to safe nutritious and sufficient food all year round. 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 nutrition needs of adolescent girls, pregnant and lactating women and other persons.

By 2030 double the agricultural productivity and income of small-scale food producers, in particular women, indigenous people, family farmers, pastorals and fishers and including through secure and equal access to land other productive resources and inputs knowledge, financial services, markets and opportunities for value addition and non-farm employment.

Further, by 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production that help maintain ecosystems that strengthen capacity for adaptation to climate change extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Further, 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 share of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed.

Increased 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, correct and prevent trade restrictions and distortions in the world agricultural markets, including through the parallel elimination of all forms of agricultural exposed subsidies and all export measures with equivalent effects in accordance with the mandate of the Doha development round.

Further, adopt measures to ensure that proper functioning of food commodity markets and their derivatives and facilitate timely access to market information including on food reserves in order to help limit extreme food price volatility. So, these are action points decided to deal with the zero hunger United Nations sustainable development goal.

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**Ensuring healthy lives and well-being for all persons with disabilities**

**Sustainable Development Goals**  
 Goal 3: Good Health and Well-being

**Convention on the Rights of Persons with Disabilities**  
 Article 25  
 • Access to health services for persons with disabilities, on an equal basis with others  
 • Removal of discriminatory barriers that prevent full access to health care services  
 Other articles highlight enhanced opportunities in the labour market and economic, community and political life which impact a person's health

**Among 42 countries, 42% of persons with disabilities report 5% of persons report disabilities prevent their health as poor**

**Persons with disabilities are more than 3 times as likely to be unable to get health care when they need it**

**In some countries, more than 50% of persons with disabilities have an unmet need for rehabilitation services like physiotherapy**

**Actions to achieve the highest attainable standard of health for all persons with disabilities**

- Develop national policies and plans on health care in line with the Convention identify and eliminate barriers to accessibility in health care facilities
- Improve health care coverage and accessibility for persons with disabilities
- Train health care personnel on disability inclusion and required service delivery for persons with disabilities
- Empower persons with disabilities to take control over their own health-care decisions
- Provide comprehensive personal, health, insurance and personal health insurance coverage for persons with disabilities and long-term care services
- Monitor national and international health systems to include and deliver for persons with disabilities

**Global Action Plan for the Sustainable Development Goals** | **SDG 3: Health** | **Full report: [sdg3health.org](#)**

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**Dr. Shiva Ji**  
 IIT Hyderabad, India

Further, we can see over here some situation for this particular group ensuring healthy lives and well-being for all persons with disabilities, so we can see over here the convention which is taking care of article 25, talks about the access to free and affordable health services for persons with disabilities on an equal basis with others, removal of discriminated barriers that prevent full access to health care services, other articles highlight enhance participation in the labor market in the economy, community and political life which impact a person's health. So, we can see over here there are considerable number of provisions made by the law to prevent the unequal opportunities faced by this group of people.

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**Ensuring inclusive and equitable quality education for all persons with disabilities**

**Sustainable Development Goals for all persons with disabilities**

**SDG 4: Quality Education**

- Inclusive and equitable quality education
- Lifetime learning opportunities for all

**Convention on the Rights of Persons with Disabilities**

**Article 25**

- Access to inclusive, quality and free primary and secondary education on an equal basis with others
- Reasonable accommodation is provided to students with disabilities

**Statistics:**

- 54% of persons with disability compared to 77% of persons without disabilities are female.
- In some countries, more than 50% of persons with disabilities have been refused entry into school because of their disability.
- In 60% of United Nations Member States, students with disabilities cannot be taught in the same classroom as other students.

**Actions to ensure equitable and quality education for all persons with disabilities:**

- Strengthen national policies and the legal system to ensure access to quality education
- Build the capacity of professionals to enhance skill training on disability inclusion in education
- Make schools and educational facilities accessible
- Promote training to education providers to increase education for persons with disabilities
- Adopt a learner-centred pedagogy which acknowledges that persons have unique needs that can be demonstrated through a continuum of learning experiences
- Engage civil society and local communities to inclusive education
- Eliminate harmful stereotypes to reduce the stigmatization of persons and help improve national policies and disaggregation of education indicators by disability
- Develop online and open-access, continuously updatable so others, knowledge information on the accessibility of schools for persons with disabilities

**UNITED NATIONS** **SDG 4** **Full span: 2015-2030** **Full span: 2015-2030** **Full span: 2015-2030**

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**Dr. Shiva J**  
**IIT Hyderabad, India**

Further, when we talk about in this area, so we have acquire quality education, also there are some convention made access to inclusive quality and free primary and secondary education on an equal basis with others.

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**Accessing sexual and reproductive health services and reproductive rights for all persons with disabilities**

**Sustainable Development Goals**  
Target 5.7: Universal access to sexual and reproductive health-care services  
Target 5.6: Universal access to sexual and reproductive health and reproductive rights

**Convention on the Rights of Persons with Disabilities**  
Article 25: Persons with disabilities have the same range, quality and standard of free or affordable sexual and reproductive health-care and programmes as provided to other persons

20% of births by mothers with disabilities are not attended by a skilled health worker

Persons with disabilities are at higher risk of unwanted pregnancies and sexually transmitted infections

22% of married women with disabilities have an unmet need for family planning

**Actions to ensure that persons with disabilities have access to sexual and reproductive health and reproductive rights**  
Develop national policies and laws that guarantee access to sexual and reproductive health and reproductive rights for persons with disabilities  
Make sexual and reproductive health-care facilities and information accessible for persons with disabilities  
Train sexual and reproductive care workers on disability inclusion  
Educate persons with disabilities on sexual and reproductive health and reproductive rights  
Develop a monitoring and evaluation mechanism to track the implementation of policies and programmes on sexual and reproductive health for persons with disabilities  
Monitor, evaluate and strengthen sexual and reproductive health care services for persons with disabilities

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Dr. Shiva Ji  
IIT Hyderabad, India

Further to this, this talks about on the convention on the rights of the persons and disabilities, if you see article 25 talks about provide persons with disabilities with the same range quality and standard of free or affordable sexual and reproductive health care and programs as provided to the other persons.

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**Ensuring the availability of water and sanitation for persons with disabilities**

**Sustainable Development Goals**  
Goal 6: Ensuring availability and sustainable management of water and sanitation for all

**Convention on the Rights of Persons with Disabilities**  
Article 28: Ensure equal access by persons with disabilities to clean water services, sanitation and other assistance for disability-related needs

More than one in seven persons with disabilities finds the toilet at home hindering or not accessible

Comprehension data indicates that only 69% of public toilets are accessible for wheelchair users

Persons with disabilities are less likely to feel in a dwelling with hygiene and sanitation facilities on the premises

**Actions to ensure the availability of water and sanitation for persons with disabilities**  
Monitor of accessibility, especially persons with disabilities  
Monitor and disseminate the availability of clean water, sanitation and hygiene facilities  
Innovative and in-situ ways to make the home accessible  
Monitor disability in rural and non-rural persons and programmes that at the same time developing disability-specific programmes  
Make information and data readily available to make evidence-informed decisions on the availability of water and sanitation facilities  
Expand monitoring capabilities to track emerging information on the availability of water and sanitation facilities  
Conduct national and international research and policy work on water, sanitation and hygiene access for persons with disabilities and integrate these into a type of disability, age and sex

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Dr. Shiva Ji  
IIT Hyderabad, India

Further in this series you can see article 28 talks about ensure equal access by persons with disabilities to clean water services, ensure access to appropriate and affordable services, devices and other assistance for disability related needs.

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**Promoting full and productive employment and decent work for persons with disabilities**

**Sustainable Development Goals**  
 Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

**Convention on the Rights of Persons with Disabilities**  
 Article 27:  
 • Right to work on an equal basis with others  
 • Right to the opportunity to gain a living by work freely chosen or accepted  
 • The Convention considers other persons referred to in employment which will optimize opportunities for persons with disabilities to participate in the labour market

**Challenges:**

- Employed persons with disabilities tend to earn lower wages than their counterparts without disabilities
- Lack of accessible workplaces and necessary accommodations pose obstacles to the employment of persons with disabilities
- Over 80% of countries include provisions in their labour laws prohibiting discrimination in employment for persons with disabilities

**To address the current employment gaps for persons with disabilities, States should ensure that:**

- National legislation protects persons with disabilities from discrimination in all areas of employment practices and ensures increasing the employment of persons with disabilities
- Public employment services are inclusive of persons with disabilities
- Businesses implement effective hiring practices to include persons with disabilities
- Private and public sector should facilitate job retention and return-to-work options for persons who acquire a disability, including for persons with mental health conditions
- Labour practices relevant are designed to provide income security and support for disability-related needs
- A database of available information and disaggregated data on disability and employment is developed

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 IIT Hyderabad, India

In this series only the article 27 talks about right to work on an equal basis with others, right to the opportunity to gain a living by work freely chosen or accepted.

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**Reducing inequalities for persons with mental impairments or psychosocial disabilities**

**Sustainable Development Goals**  
 Goal 10: Reduce inequalities within and among countries

**Convention on the Rights of Persons with Disabilities**  
 The Convention identifies that persons with disabilities include persons with mental impairments and all articles of the Convention are relevant for persons with psychosocial disabilities

**Challenges:**

- One in four persons with psychosocial disabilities experiences physical or sexual violence in a given year
- In some countries, only 18% of persons with psychosocial disabilities are employed
- Access to many income-generating opportunities are denied to many persons with psychosocial disabilities

**Actions to ensure the social, cultural, economic, civil and political inclusion of persons with psychosocial disabilities:**

- Review national policies and legislation to ensure it is based from the viewpoint and duly the rights of persons with psychosocial disabilities
- Encourage policies, including identification and formal and informal networks, and ensure a full range of services and support to ensure access to quality mental health care services
- Develop policies and programmes targeted to persons with psychosocial disabilities to support their equal participation in society
- Employers persons with psychosocial disabilities and support their participation in income-generating practices, to be independently and to be included in the community on an equal basis with others

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 IIT Hyderabad, India

Next in this line this talks about the sustainable development goal 10, it talks about equalized opportunities, so the person from this section also must be given with the equalized opportunities.

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**MAKING THE SUSTAINABLE DEVELOPMENT GOALS OF 2030 AND WFP PERSONS WITH DISABILITIES**  
**Making cities and communities inclusive and sustainable for persons with disabilities**

**Sustainable Development Goals**  
Goal 10: Make cities and human settlements inclusive, safe, resilient and sustainable

**Convention on the Rights of Persons with Disabilities**  
The Convention includes articles providing for adequate standards of living and social protection  
The Convention includes articles providing for adequate standards of living and social protection  
- Article 19: Right of all persons with disabilities to live in the community, with choices equal to others  
- Article 28: Right of all persons with disabilities to an adequate standard of living and social protection

**In some countries, more than 10% of persons with disabilities find that transportation and public spaces are not accessible**

**In some countries, more than 50% of persons with disabilities find that dwellings lack basic amenities**

**As a result of difficulties in accessing education, training, employment and housing, a disproportionate number of persons with disabilities are homeless**

**Actions to make cities and communities inclusive and sustainable for persons with disabilities**  
- Enforce the existing policies and laws on accessible housing, public information, transport and services for persons with disabilities  
- Develop national policies and laws that promote services to support and facilitate housing for persons with disabilities  
- Foster development of disability among communities and broader markets and create the enabling environment where persons with disabilities are included without discrimination and can participate equally in these communities  
- Share knowledge and best practices and build capacity to implement measures promoting accessibility and inclusion  
- Improve research and data to monitor, evaluate and strengthen urban development to be more accessible and inclusive for persons with disabilities

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Next in line, this talks about the convention on the rights of the person with disabilities on the article 19 it talks about right of all person with disabilities to live in the community with choices equal to others, article 28 talks about right of all person with disabilities to an adequate standard of living and social protection.

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The slide features the NPTEL logo in the top left corner. The main content is organized into several sections:

- Sustainable Development Goals - Targets:** A vertical list of three goals: 4.a (Build disability sensitive education facilities), 11.2 (Provide accessible transport systems), and 11.7 (Provide accessible public and green spaces).
- Accessibility Statistics:** Three key statistics are presented: 52% of schools are not wheelchair accessible; 61% of government websites are not accessible; and a statement that 'Accessibility makes education possible' and 'Accessibility empowers users'.
- Accessibility for Persons with Disabilities:** A central heading with a horizontal line above and below it.
- Disaster Evacuation:** A graphic showing a building with the text '79% face difficulties or cannot evacuate during a disaster' and 'Accessibility saves lives'.
- Countries with accessibility standards or guidelines:** A world map with data points: Europe (90%), Africa (48%), Asia (73%), and Oceania (71%).
- Convention on the Rights of Persons with Disabilities:** A graphic with icons of people with disabilities and the text 'Article 9 requires States to ensure equal access to facilities and services'.
- Footer:** Includes the United Nations logo, Department of Economic and Social Affairs, and Dr. Shiva J. IT Hyderabad, India.

So, in like overall sense if you see, the sustainable development goals are giving us some targets and targets are such sub sector, we can break them into several objectives and actionable points and we can try achieving them given or specific time, we can go back and review again if there are additional corrective measures needed, we can go back and implement them and we can try finishing up, try achieving that goal in the given time.

So, this talks about over here build disability sensitive educational facilities, provide accessible transport system, provide accessible public and green spaces, if we see further persons with the disabilities, 52 percent of schools are still not having wheelchair accessibility and 61 of government websites are also not accessible to these sorts of people, for example, who are blind or you cannot hear, you cannot see things, so this is the kind of limitations they are experiencing, so there should be wholesome effort each and everywhere to minimize such like inconveniences to this section of people.



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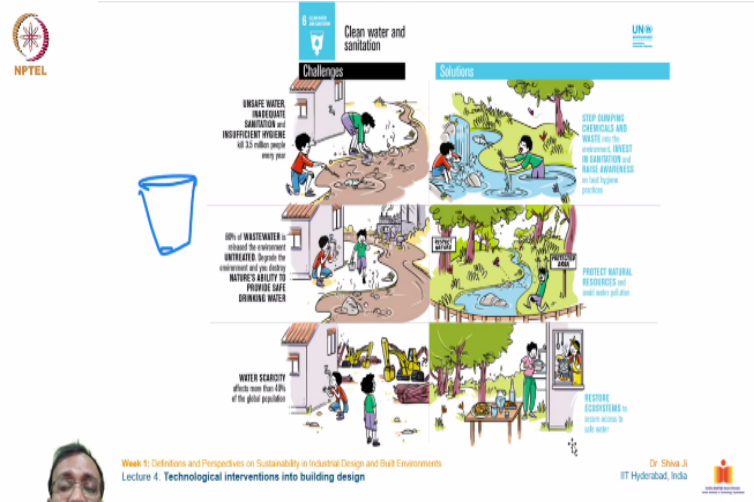


In this particular slide it is a dense slide, you can see over here this talks about all indicators there are 232 SDG indicators and what sorts of data are available, so you can see this green talks about indicators for which recent global official metrics are available, this yellow one talks about indicators that do have official metrics but for which available data is very incomplete or outdated and the red ones are data sets to the best of our knowledge the global monitoring is not currently possible.

So, you can see over here for the no poverty (1)(25:22) over here for the extreme poverty, well the data is available but the moment we see about secure land rights, so the enough data is not available to evaluate these things, social protection, basic services, disaster, deaths, disaster costs, so for these assessments and evaluations ample data is available but for evaluating national poverty, national poverty lines or these things, so limited or restricted amount of data is available.

Similarly, you can see among all of these 17 SDG you can see the availability of data, so why this data set is important over here, in the absence of the data itself, how the corrective actions and how the corrective measures can be taken up, so this data collection, this information gathering is very important, is very critical for the success of these UN SDG. So, the countries and the mechanisms must work to first of all gather this data, so that the corrective measures can be taken up.

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So, I would like to talk about here about this clean water and sanitation, this is a graphic to promote such thing and what are the challenges in this particular area and what are the solutions, what are the tentative solutions, so it is a graphic given by United Nations like environment program, so you can see over here in the challenges, so the challenges are in terms of like the unsafe water, any inadequate solution and insufficient hygiene, it kills around 3.5 million people every year, that is a huge number 35 lakh people are killed by just unsafe water.

Next scenario if you see, 80 percent of waste water is released, in the environment untreated, it degrades the environment and it destroys the nature's ability to provide safe drinking water. So, the 80 percent of wastewater released is untreated and unsafe and it is toxic. On the water scarcity front if you see, the water scarcity affects more than 40 percent of the global population, so that means a 40 percent of the global population, 40 out of 100 people are having some kind of challenge in just accessing the water, so this is the scenario.

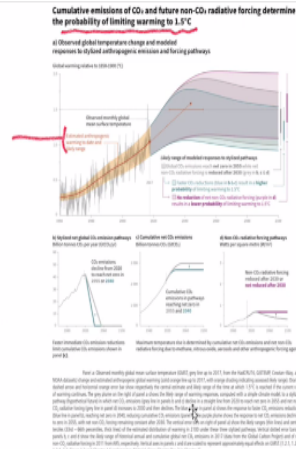
So, for these challenges what are the tentative solutions? So, let us see on the right side, stop dumping chemicals, waste into the environment, invest in sanitation and raise awareness on the best hygiene practices. Well, some solutions are very, very simple, some of the solutions are very, very behavior and action based for example, adopting a hygienic

practice and raising awareness, one should be conscious of not consuming or not taking water from the bad sources, as you can see over here in this left graphic, these people sourcing from a spoiled place of, there is a spoiled source of water.

So, one must not consume water from these places and most of this water has gone bad because of the sewage discharge, because of the chemical effluence, the factory discharge and several other types of like the pollutions. So, if we stop poisoning our water simply our water resource will get cleaned.

In the next scenario if you see the protect natural resources and avoid water pollution, of course, the point which I was talking about. Finally, restore ecosystem to secure access to the safe water, so once the ecosystem is in the balanced position because water bodies they have natural tendency of cleaning themselves, so if you just leave them like that for period of time, so the rivers, these lakes and they clean even the oceans, they have this their own resilient capacity to heal themselves, so one must not keep polluting them or keep leaving discharge in these water bodies, so these solutions are not very rocket science, they are not very complicated to understand and difficult to grasp but this should must go into our practices.

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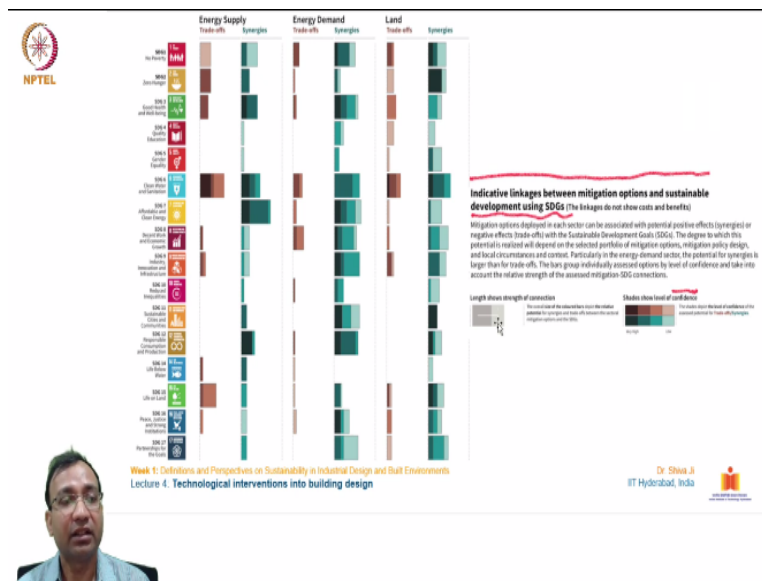
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Dr. Shiva Ji  
IIT Hyderabad, India

Finally, this chart I would like to explain over here, I think we have seen it earlier also cumulative emissions of CO<sub>2</sub> and future non-CO<sub>2</sub> radiative forcing determine the probability of limiting warming to 1.5 degree, some degrees centigrade temperature. So, we are ware our world is experiencing this global warming phenomena and that is because of the tremendous amount of exhaust and the pollution and the other impacts in several forms, and lot of emissions of greenhouse gases in the atmosphere and all that and as a result the world's temperature, average temperature it is observed, it is rising and it is further going to increase in the next decades, if we do not stop and if you do not behave reasonably and sustainably.

So, this is the kind of a range given over here which talks about the kind of repercussions it may posed to us if it is not stopped but if it stops of course, it has the potential to bring back to the normal position as you can see in this lower chart at the over here. Let me move on because we have seen enough on this sort of data.

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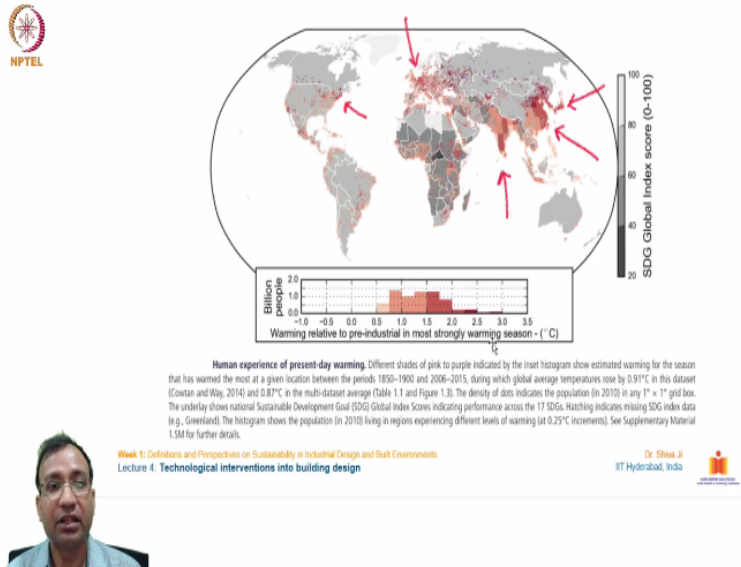
But let us more talk about the UN SDG only, here if you see this chart shows about indicative linkages between mitigation options and sustainable development using these SDG, so here for this entire these are 17 SDG it talks about trade-offs and synergies which are possible, so you can see these color codes over here, it talks about how much is possible, how much is the kind of a connection it can establish. So, you can see from this legend, the lengthier this bar, the deeper the connection is and with the shades of these color over here, it shows the confidence level.

So, we can see over here in the no poverty this SDG the confidence lower level is lower, which is not a good sign but, in the synergies, well the confidence level is high and it can improve itself. Similarly, you can see over here in the energy demand, the confidence level is at the medium level but at the synergy level there is a portion of the high confidence level also.

Similarly, if you see in the quality education, well it seems there is no data available in many of these SDG but some of these SDG they have a higher confidence of recovery, as you can see over here in the clean water and sanitation, we are seeing a deeper level of confidence over here and the and the length of connection also is high over here but some of the others, this decent work and economic growth over here a very small length that

means the smaller connection is possible. So this gives an indicative idea about the existing mitigation plan and the linkages between these developmental activities.

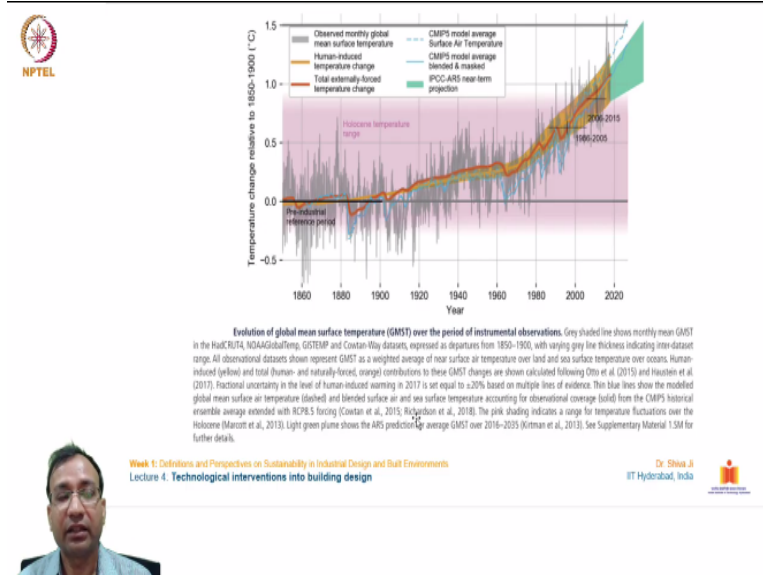
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Further, moving on to this next slide, how this warming is happening, so we are all aware these are some of the locations in the global map, we can see which are experiencing very high temperatures, they are experiencing more on this overall warming part, so these are the regions, India also unfortunately is one of the reasons where warming and significant warming over the last a few years is observed.

So, you can see in this scale over here, this talks about range from 0.1 degree Celsius to up to 2.5 over here, so some of the portions in the India over here, here and some of the portions in the China over here and some of the portions in the Europe and in Northern America are experiencing temperature rises in this in this range.

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Next to this again, how this global mean surface temperature is rising, so there is some model given on this explanation.

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So, on this slide we can see this sustainable development implications of alternative mitigation choices for 1.5 degrees centigrade like a pathway. So, the pathways which is which United Nations has proposed, so it has some reflections from these 17 UN SDG that we can see over here on this particular table. So, this slide, the legend I think we will

go with the with these legends first. So, the green cell talks about the potential synergies with the SDG achievement, so there is a potential synergy which is possible with the achievement of these many SDG which you can see over here in this green, this dark green color.

And in the red color with the minus indication, you can see there is a risk of trade-off with the SDG achievement, in the yellow color if you see with the plus minus it has both the risk of the trade-off as well as the potential for the synergy also and in the white ones well, they are either neutral or not directly related or not directly affected. With the intensity of the color, you can see over here, the lightest intensity talks about the low confidence, the medium one talks about the medium confidence and then the dark intensity, the dark chromatic value of this color talks about the high confidence.

Similarly, you can see over here these are 17 SDG listed over here, so based on the demand, supply and the requirement of the lands we can see the kind of a synergy, the potential synergies which are possible in which of these UN SDG and the kind of risks, where are the risks involved in some which of these implication areas and which of these SDG, so there is a correlation we can understand from here, which are still some risk areas or the potential areas where a significant amount of work is needed, a significant amount of efforts are needed. So, this gives a detailed idea, so maybe I would advise all of you to find this document from the internet, this is freely available for accessing and you can go through this in detail for your understanding.



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**SUSTAINABLE DEVELOPMENT REPORT 2019**  
Transformations to achieve the Sustainable Development Goals  
Includes the SDG Index and Dashboards

April 2019  
A Reference Offering and Sustainable Development Solutions Strategy  
The views expressed in this report do not reflect the views of any organizations, agency or programme of the United Nations. They have been prepared by the United Nations Institute for Sustainable Development (UNSD) in partnership with the United Nations Development Programme (UNDP).  
This report has been prepared with the cooperation and contribution of the 2019 award-winning Sustainable Development Solutions Strategy (SDSS) projects in the areas of health, wellbeing, and demography, energy decarbonization, sustainable industry, sustainable food, land, water, and oceans, sustainable cities and communities, and digital revolution for sustainable development. For more information on the award-winning SDSS projects, visit [www.un.org/sustainabledevelopment/solutions](https://www.un.org/sustainabledevelopment/solutions).  
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Lecture 4: Technological interventions into building design

Dr. Shiva J.  
IIT Hyderabad, India



So, this slide talks about sustainable development report 2019. So, this is taken from this source maybe you can search for this source, this report is also available freely online for referencing, so I would like to discuss some of the aspects which I found interesting and valid for our discussion, our today's discussion in this class.

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Six SDG Transformations underpinned by the principles of leaving no one behind and circularity & decoupling

**Leave No One Behind**

1. EDUCATION, GENDER, AND INEQUALITY  
SDGS 1, 5, 7-10, 12-15, 17
2. HEALTH, WELLBEING, AND DEMOGRAPHY  
SDGS 1, 2, 3, 4, 5, 8, 10
3. ENERGY DECARBONIZATION AND SUSTAINABLE INDUSTRY  
SDGS 7-16
4. SUSTAINABLE FOOD, LAND, WATER, AND OCEANS  
SDGS 1-3, 5, 6, 8, 10-15
5. SUSTAINABLE CITIES AND COMMUNITIES  
SDGS 1-16
6. DIGITAL REVOLUTION FOR SUSTAINABLE DEVELOPMENT  
SDGS 1-4, 7-13, 17



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Dr. Shiva J.  
IIT Hyderabad, India




So these are six SDG transformations underpinned by the principles of leaving no one behind and circularity and decoupling. So, these are the six SDG transformation areas,

transformation domains which are targeted, so that there is no one left in the whole this process of growth and development in the recent times. So, those are if you see the first one is education, gender and inequality it touches the sustainable development goals of like 1, 5, 7 to 10, 12 to 15 and 17.

The second one this transformation is in the health, well-being and demography, the third one in the energy decarbonization and sustainable industry, the fourth one in the sustainable food, land, water and oceans, the fifth on sustainable cities and communities, further, digital revolution for sustainable development. So, these are six transformations possible because with this it is likely that there would not be anyone left behind in this whole process of growth and development.

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**Circularity and Decoupling**

- 1. Education, Gender, and Inequality.** Involving ministries of Education, Science and Technology, Gender Equality and Family Affairs, this transformation covers investment in education (early childhood development, primary and secondary education, vocational training and higher education), social protection systems and labor standards, and R&D. It directly targets SDGs 1, 2, 4, 5, 8, 9, and 10, and reinforces other SDG outcomes.
- 2. Health, Wellbeing, and Demography.** Groups interventions to ensure Universal Health Coverage (UHC), promote healthy behaviors, and address social determinants of health and wellbeing. It directly targets SDGs 2, 3, and 5 with strong synergies into many other goals. Implementation will need to be led by ministries of health.
- 3. Energy Decarbonization and Sustainable Industry.** This transformation groups investments in energy access, the decarbonization of power, transport, buildings, and industry, and curbing industrial pollution. It directly targets SDGs 3, 6, 7, 9, 11-15, and reinforces several other goals. Implementation will require coordination across a large number of industries, including energy, transport, buildings, and environment.
- 4. Sustainable Food, Land, Water and Oceans.** Interventions to make food and other agricultural or forest production systems more productive and resilient to climate change must be coordinated with efforts to conserve and restore biodiversity and to promote healthy diets, alongside major reductions in food waste and losses. Important trade-offs exist between these interventions, so we recommend identifying and addressing them inside one transformation, which will need to mobilize a broad range of ministries, such as agriculture, forestry, environment, natural resources, and health. This broad transformation directly promotes SDGs 2, 3, 6, and 12-15. Many other SDGs are reinforced by these investments.
- 5. Sustainable Cities and Communities.** Cities, towns, and other communities require integrated investments in infrastructure, urban services, as well as resilience to climate change. These interventions target of course SDG 11 and they also contribute directly to goals 6, 9, and 11. Indirectly virtually all SDGs are supported by this transformation, which relies on leadership from the ministries of transport, urban development, and water resources.
- 6. Harnessing the Digital Revolution for Sustainable Development.** If managed well, digital technologies, such as artificial intelligence and modern communication technologies can make major contributions towards virtually all SDGs.

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**Dr. Shiva Ji**  
IIT Hyderabad, India

Further, we can understand what is circularity and decoupling over here. So, in the first head education, gender, inequality it involving Ministries of Education, science and technology, gender, equality and family affairs, this transformation covers investment in education, early childhood development, primary and secondary education, vocational training and higher education, social protection systems and labor standards and R and D.

It directly targets SGD 1, 2, 4, 5, 8, 9, and 10 and reinforces other SGD outcomes. So, as you can see the focus is directly on the education, primarily like education, gender

equality and removing inequality in the society, the second one talks about health, well-being and demography, groups interventions to ensure universal health coverage UHC, promote health behaviors and address social determinants of health and well-being, it directly targets SDG 2, 3 and 5 with strong synergies into many other goals, implementation will need to be led by the ministries of health.

So, it is directly advising, directly it is recommending which are those specific ministries which should take up such challenges as actionable points. The third one talks about energy decarbonation and sustainment industry, this transformation groups investments in energy access, the decarbonation of power, transport, buildings and industry and curbing industrial pollution, it directly targets SDG 3, 6, 7, 9, 11 to 15 and reinforces several other goals, implementation will require coordination across a large number of industries including energy, transport, buildings and environments.

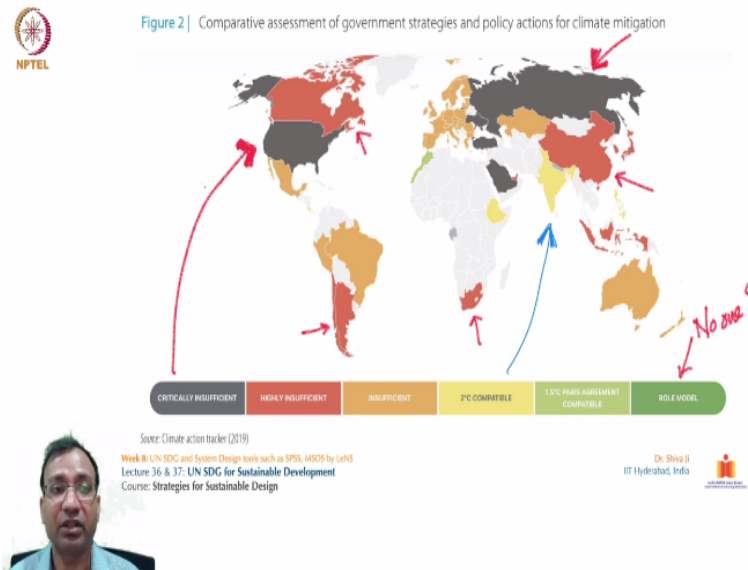
So, the sectors and the targets are clearly defined, where to hit, where to go for the action. The fourth one talks about a sustainable food, land, water and oceans, so in this one we can see interventions to make food and other agriculture, all forest production systems, more productive and resilient to climate change, must be coordinated with efforts to conserve and restore biodiversity and to promote healthy diets alongside major reduction in food waste and losses.

Important tradeoffs exist between these interventions, so we recommend identifying and addressing them inside one transformation which will need to mobilize a broad range of ministries such as Agriculture, Forestry, Environment, Natural Resources and Health this broad transformation directly promotes SDG 2, 3, 6 and 12 to 15 many other SDG are enforced by these investments.

Further, we see the fifth one sustainable cities and communities, cities towns and other communities require integrated investments in infrastructure, urban services as well as resilience to climate change, these interventions target of course SDG 11 and they do also contribute directly to goals 6, 9 and 11, indirectly virtually all SDG are supported by this transformation which relies on leadership from the ministries of Transport, Urban Development and Water Resources.

The sixth and last one, it talks about harnessing the digital revolution for sustainable development, if managed well digital technologies such as artificial intelligence and modern communication technologies can make major contribution towards virtually all SDG.

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So, in this slide you can see these talks about a comparative assessment of government strategies and policy actions for climate mitigation, so in this one you can see which are those countries who are putting up a significant effort and which are those countries who are not putting a desired of resources and inputs.

See these currently insufficient, critically insufficient, so these dark color countries for example, United States of America, Federation of Russia, some other countries from Europe and these gulf regions, so these are the countries which are highly responsible as the big emitters in the recent times including like China and they are not putting significant or critical and the situation is really critical for these because they are kept into a critically insufficient category.

And then these red ones you can see over here like Chile and this country and the Canada and the China over here and the South Africa, Indonesia I think, these are the countries under highly insufficient category. Well you can see some improvement in these countries

which are still in the insufficient such as like Brazil, Mexico and Australia over here, Ukraine and most of these are European countries they are all under insufficient activity.

So, most if you see, most of these countries these are developed countries who are having either they are in the developed category or they are they are developing very fast, they have huge volume of GDP, they have huge volume of like emissions but still they are not putting up significant efforts for the like overall climate change mitigation and the meeting the United Nations sustainable development goals.

So, well two degrees comparable if you see like the countries, so India is one of those countries which is following this lead and this is a country which is kept in the category where which is complying controlled increase in the average temperature of the globe right now.

But the rest of the countries we are seeing in this dark color red and this orange color, they are severely in bad area, they are severely in the lacking in the efforts for this improvement in the sustainable manner. Well on this map I see only one or two countries over here which are having this lighter green, so they are compatible with 1.5 degrees target goal which just established in the Paris agreement.

But I do not see any country in the dark green color which is catered as role model, country, well currently there is no country which can be called as role model at least whatever that I can see on this a map over here. So, there is a tremendous opportunity for the countries to follow the lead and move from this side of this graph towards the right side, towards the greener side.

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Figure 4 | Average spillover score against Gross Domestic Product (GDP), per capita in purchasing power parity (PPP)



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Dr. Shiva J.  
IIT Hyderabad, India

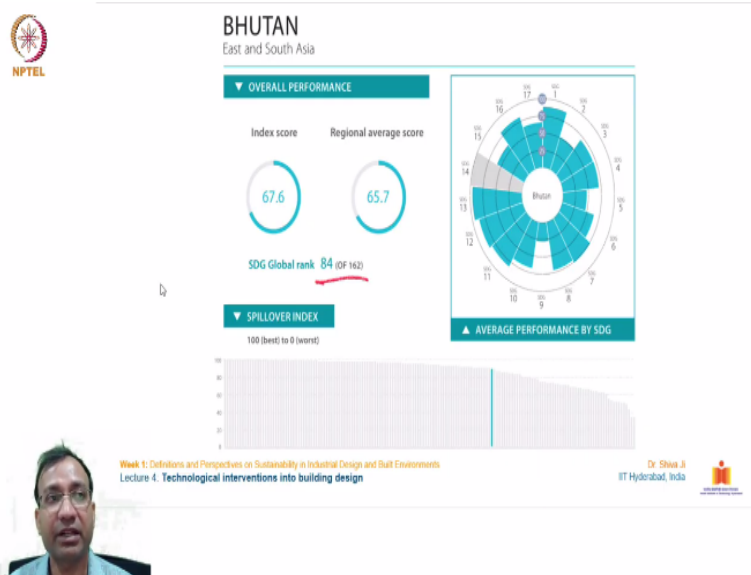
So, here if we see this graph talks about average spillover score against gross domestic product per capita in purchasing power parity. So here if you see on the x dimension, we have this GDP per capita in purchasing power parity constant like this from the year 2010. So, this is given in the US dollars, so starting from zero dollar up to one lakh twenty thousand dollars, so the countries are divided on this scale for per capita purchasing power.

And on the y dimension if you see this is elaborating on the average of spillover effects, 0 being the worst one and hundred being the best, so hundred means at the bottom only here on this scale, so if you observe the country of India itself like our own country is doing relatively much better and it is I think touching this bottom line of hundred, it may not be exactly hundred but I think it's close to around like 95 or even maybe on 99 or something like that or maybe very close to 100 on the spillover effect.

So, that means India is not exerting spillover effect though it is not doing a very good on this parameter also and the per capita purchasing power is relatively far lower compared to the other countries which we see over here like the Qatar is topping this list and the per capita income in the Qatar is the highest in the world now, with the according to this graph and followed by Luxembourg, Singapore and then Ireland, United Arab Emirates, Kuwait, Norway, Switzerland then comes the United States and several other European

countries like Germany and Australia is there, United Kingdom is there, France is here, Italy, Japan, Korea, Saudi Arabia and these countries if you see like this group so they are in the tending towards the worst category also this Switzerland, Singapore, Luxembourg, United Arab Emirates, United States, United Kingdom and so these many countries are responsible for this mess also, so that is overall outcome from this particular slide.

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So, further in this continuation we have this slide which talks about the overall performance from country perspective. So, I have taken this example of Bhutan and India, so particularly Bhutan right now on the index score it has achieved like 67.6 points on the regional average score, it has received like 65.57 points and you can see on the rows diagram of 17 SDG how much is the kind of average performance it is giving in each of these, so this distribution is given over here.

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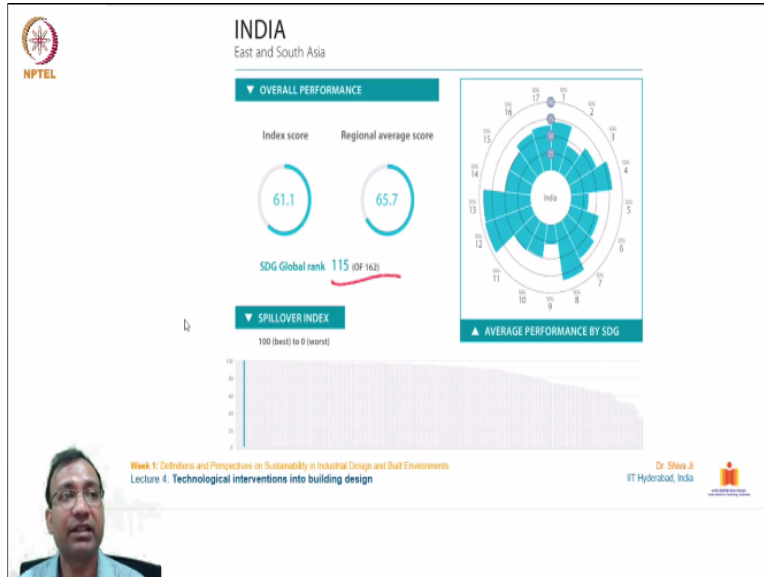
In the next slide it talks about the current assessment of Bhutan as a country on this SDG dashboard, so we can see the SDG trends, first of all let me give you the hint about these legends, so this red arrow which is pointing bottom word, it talks about whether the efforts are decreasing, so there is very least effort or rather the effort is in the minus and with the orange and the later arrow which is pointing forward.

So, it shows about like the stagnation, the effort is neither increasing not decreasing, with the yellow this is 45 degrees, this arrow is pointing in the upward direction, with the 45 degrees this angle so this is talking about the moderately improving situation and with this green upward arrow we can understand this is on the track or maintaining the SDG achievement.

So, we can see over here on this particular table, in the context of Bhutan there is only one SDG of climate action where there is this green arrow marked, that means Bhutan is maintaining its space on maintaining this climate action, rest of the others either there is lack of the data, they are left with the dots otherwise they are moderately improving or in some cases they are stagnating, but since there is like insufficient data on these many SDG so it is very difficult to conclude from here but anyway we will move on to the India.

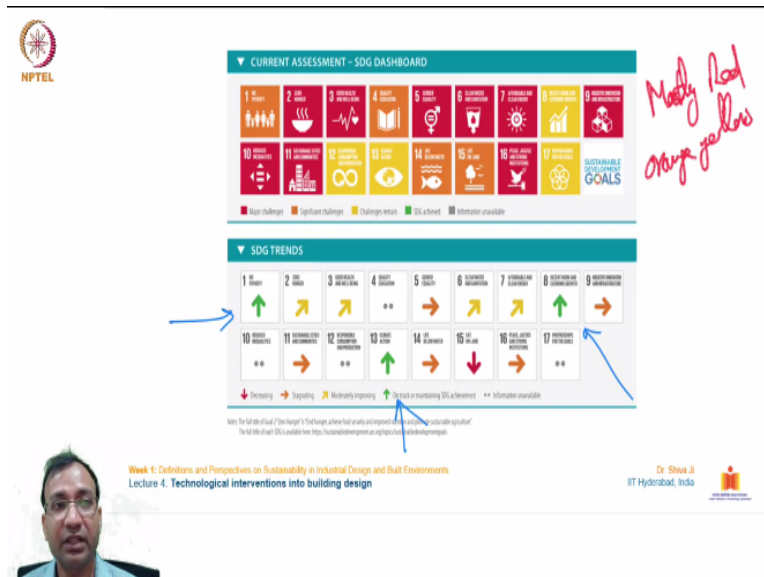


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So, on this slide you can see the overall performance of India as a unit country, how it is performing on the index score, so this has score like 61.1 and on the regional average score it has scored 65.7. So, on the global SDG rank India is at the level of 115 out of 162 countries, this is a rose diagram where you can see the average performance by each SDG group.

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In the next slide, so this one talks about this the same, how is it trending, so we can see at least three green arrows over here, so these are on the no poverty front and this eighth one is the decent work and economic growth and the thirteenth one is the climate action. So, we can see at least positive at least, a satisfactory trending pattern in these three SDG points and we see four arrows which are we can say as moderately improving and we can see at least five arrows with the stagnation mark, and we see one mark which is decreasing which shows significant effort are needed in this one, this is about life on land, so that means this SDG is not properly being addressed by India currently. So this is the most critical opportunity area which we must work on.

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The screenshot displays the 'INDIA Performance by Indicator' dashboard. It features a grid of 17 SDG indicator cards, each with a title, a brief description, and a performance score with a trend arrow. The indicators are grouped by color-coded headers: Blue (SDG 1-3), Green (SDG 4-6), Orange (SDG 7-11), and Red (SDG 12-17). The 'Life on Land' indicator (SDG 15) is highlighted in red, indicating a decrease in performance.

Indicator	Score	Trend
SDG 1 - End Poverty	21	↑
SDG 2 - Zero Hunger	22	↑
SDG 3 - Good Health and Well-being	23	↑
SDG 4 - Quality Education	24	↑
SDG 5 - Gender Equality	25	↑
SDG 6 - Clean Water and Sanitation	26	↑
SDG 7 - Affordable and Clean Energy	27	↑
SDG 8 - Decent Work and Economic Growth	28	↑
SDG 9 - Industry, Innovation and Infrastructure	29	↑
SDG 10 - Reduced Inequalities	30	↑
SDG 11 - Sustainable Cities and Communities	31	↑
SDG 12 - Responsible Consumption and Production	32	↑
SDG 13 - Climate Action	33	↑
SDG 14 - Life Below Water	34	↑
SDG 15 - Life on Land	35	↓
SDG 16 - Peace, Justice and Strong Institutions	36	↑
SDG 17 - Partnerships for Goal Achievement	37	↑



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Dr. Shiva Ji  
IIT Hyderabad, India

Well, more detail observations are given in this particular table. So, the performance by indicator, so you can see the value rating and the trends are given for each of these indicators in detail over here. Well, this particular data is available on the internet, so you can refer this data, you can browse it maybe you can download it for your reference and your understanding which are those areas where there is some significant improvement and which are those areas which are critical and require one of the best efforts to improve and so this is the end of our this lecture so thank you everyone.