

Education for Sustainable Development
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Lecture - 54
Sustainable Cities and Communities

Hello viewers welcome back to this NPTEL course on ESD Education for Sustainable Development. So, today we will discuss a new topic that is SDG 11 that is about Sustainable Cities and Communities.

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Let us come to this some of these you know some of these pictures images of what the sustainable cities and communities look like. As you can see these are the some of the clips of you know some of the clips of sustainable cities and communities. And how this SDG 11 is also related to other SDG's like you know SDG 4, SDG you know SDG 1, 2 SDG plant land on life, marine life climate change almost every almost every here can say 12 almost 10 to 12 SDG's it is related to.

So, now we will discuss about the you know core, you know core concepts of sustainable cities and; sustainable cities and communities. What are the primary factors how it is getting affected and what its role in achieving the sustainable development and growth across the globe sorry in global context.

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- Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment.
- To pursue sustainability is to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations;
- In order to be sustainable, communities must put the environment at the forefront.
- Sustainable planning considers how to minimize inputs like energy, water, and food, as well as how to reduce waste outputs of heat, air pollution, and water pollution.
- Targets for achieving [Goal 11 – Sustainable Cities and Communities](#) – include reducing the adverse effects of natural disasters, ensuring everyone has access to green spaces and addressing the environmental impact of cities.

So, now let us have to let us discuss about the you know basic thing concepts about the causes of you can say the reasons of unsustainable cities or unsustainable communities. And from these reasons then we will go to the sustainable factors of sustainable cities and the communities.

Now, so everything that we need in our environment for our survival for wellbeing, it primarily definitely depends on our natural environment. Natural environment consist of you know natural resources plants, plants, animals, everything in the ecosystem the complete ecosystem and environment.

So, it is a open its open secret is a known factor ok. So however, to pursue sustainability how to pursue sustainability to create and maintain that conditions you know conditions in which we can coexist with other organisms other and organisms and the coexist to the environment. The other environmental factors like you know greenery, animal other animal planet and the plants everything.

So, we can coexist with them in the in a very productive way in a very harmonious way. So, that our environment our ecosystem will be restored will be conserved will be restored for the future generation as well. So, environment in terms of the resources, in terms of you know habitation quality of habitation all kinds of thing amenities facilities.

So, how can we co-exist harmoniously with our environment and various you know other organisms of the environment and how can this we can sustain this kind of environment ecosystem and maintain that conditions for the future generation as well. So, this is the primary focus of SDG 11. So, that is definitely so all of us we have to put the environmental factor in the as the forefront at the forefront; that means, it should we should prior to give the priority to the environmental factors here.

So, that is that the main factor what are the what would be the objectives. How to minimize the inputs like? How to minimally use minimally exploit? How to minimize the inputs of or the uses of you know energy, water, food, etcetera. How to yes definitely in order to survive we have to use this resources.

But anyway without wasting without wasting how can we minimize these resources like food, water, energy, etcetera. At the same time how can we reduce the waste reduce the waste outputs like in terms of heat, heat in terms of pollution, in terms of waste, waste and how to manage the waste.

So, how to minimize the inputs or resources with the minimum resource depletion? And again how to reduce the wastage that can directly effect affect the environment in terms of pollution, in terms of heat, in terms of other kinds of exploitations.

So, that is why the SDG 11 actually it focuses on achieving the sustainable cities and the communities across the globe and to reduce primary focus will be to reduce the adverse effects of the natural disasters and the you know climate change, climate change and the global warming all these kinds of because of this ok kind of causal factors. How to minimize, how to reduce and how to again how to you know mitigate this kind of natural disaster some of the disasters also are also manmade disaster.

So, how to mitigate this kind of disasters and making our environment more green and giving opportunity for our people for our people to you know to have the green space eco friendly practices of you know not only products; not only products.

But also other kinds of amenities how; that means, to ensure that how it all these things all these our lifestyle, our habitat, our consumption etcetera. How would it minimize the resource; minimize the resource exploitation and minimize the pollution, minimize the

damage to the environment. And whatever waste and pollutions of the carbon footprints are being produced as a result of this consumptions.

So, how can we minimize it? How can we reduce it? And how can we go for more you know more energy efficient ways, mean more greener green energy, more clean energy or you know more renewable energy and more you can say waste management all kinds of practices.

So, that we can restore, we can restore and make our cities more sustainable more sustainable more you know futuristic and more environment friendly or eco friendly. So, as you can see these are the some of the clips like you can see this is the; this is the you know this is the image of a very good you know ideal or ideal city or the sustainable city.

Where you know energy; that means, minimum energy uses in terms of ecofriendly green energy and wherever it is possible the transports are also being arranged in a eco friendly way, as minimum yeah minimum opportunities minimum scope of pollution. So, again greenery, greenery and solar energy and all water and water connection, water connectivity power system all these things what are the minimum.

So, public transport to you know to the public transport to the energy to the water conservation and clean, clean water waste management everything all these things comes under the purview of SDG 11.

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➤ A sustainable city concept incorporates **eco-friendly practices, green spaces and supporting technology** into the urban environment to **reduce air pollution and CO2 emissions, enhance air quality,** and protect natural resources.

➤ These practices lead to a **healthier environment** for city residents and a lower carbon footprint for the city.

➤ Sustainable cities are becoming essential in the quest to **reverse global climate change.**

➤ A sustainable city is an urban center engineered to **improve its environmental impact** through urban planning and management.

➤ **Green technology is a key factor** that is helping to foster more sustainable urban development.

➤ It comprises all aspects of **city planning,** including **transportation, infrastructure, telecommunications and energy.**

1 SUSTAINABLE CITIES AND COMMUNITIES

In the locality of big cities, dense numbers and their numbers need safe and welcome to all public. When disaster and humanitarian crisis, women and children are disproportionately. Pregnant or lactating women need portable support during such times.

www.un.org/sustainabledevelopment

THE GLOBAL GOALS

What does a sustainable community look like?

100% green buildings
100% green spaces
100% green energy
100% green transport
100% green waste management
100% green water management
100% green food security
100% green social equity
100% green digital inclusion

So, what we were required to do, what we need to do? So, we have to adopt, so we have to adopt we have to incorporate ecofriendly practices ok. Practices like creating more and more green space, supporting technology for urban planning and to reduce the air pollution, zero carbon emission, carbon neutrality, enhance the air quality and you know protect the natural resources.

So, through technology also we can restore, we can revive the, you can revive the atmosphere the environment in a very sustainable way. So, these practices these practices can lead us towards a healthier environment. So, that in this way the primary again the primary objective is to how to reverse back the climate change global.

Reverse global climate change because of which; because of which we are very frequently we are facing this natural disaster, manmade disasters, all kind of calamities even pandemic so and so. So, how to reduce all these things? So, in this ways also definitely sustainable city and urban area urban centered; that means, plan city urban planning or the you can say sustainable city and sustainable communities. Definitely it improves the environmental impact through urban planning and logistics and management.

So, here, so the you know the topic of the issue of the urban planning how sustainably we can do plan our cities in a very sustainable way the. So, urban planning urban city architectures managements amenities these are very important factors. So, here so automatically technology definitely helps us.

So, here the green technology is a key factor ok that fosters that helps us in fostering more and more sustainable in sustainable urban development. So, green technology now it is more of green technology is the key factor in enhancing the quality of life and sustain developing and building the sustainable cities and community.

So, definitely, so here definitely so the green technology definitely helps us in city planning. So, what does the main factor what is the city planning includes? What does the city plan includes? That it includes transportation, public transportation, private transportation, infrastructure, basic amenities, telecommunication, energy and it also health facilities food.

So you can say within the city within the city like our access to hospitals, health facilities. Then food security and food stocks then our water, then energy. These are the important factors for our self survival. Transport communication and then again energy primary energies all these and again at the same time air quality also air quality.

So, how to reduce the pollution a waste management again in the urban cities lot of wastages are being created because of the overpopulation crowded stakeholders, crowded consumers and customers. So, how to minimize? How to manage waste management is the biggest challenge. You can see in every big city or the cosmopolitan or the urban cities so that is it.

So, this how through green technology how can we reduce all these side effects, reduce these negative impacts and how can we enhance not only our living conditions, but our cities, our homes, our places and create more and more greenery pieces. So, just planting the trees planting the trees like to reduce the carbon is not just the only way and only approach to enhance the greenery. But there are also we can use extensively the technology to reduce other kinds of side effects and the negative impacts.

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MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

- **Characteristics and Key Features of a Sustainable City**
- Cities can do a number of things to support sustainable practices:
 - Make it easy to get around without a car
 - Add EV charging stations
 - Provide access to public resources and green spaces
 - Improve water conservation and wastewater management
 - Support urban farming, Implement green architecture
- [Connecting Green Tech with IoT – YouTube](#)
- [Understand Goal 11: Sustainable Cities and Communities \(Secondary\) - YouTube](#)

The slide features a background image of a tram on the left and a modern building with greenery on the right. A woman in a red and yellow sari is visible in the bottom right corner, appearing to be presenting the slide.

So here as you can see how to make the cities and human settlements more inclusive, safe, resilient and sustainable? So, here besides the environmental factors besides the amenities and the facilities etcetera. Again we have to make it more inclusive like in the cities all the stakeholders, all the all types of in all age groups of citizens are there.

Children from the start children to aging parents to the working professional to labor communities to the housewives all kinds of that is why we have to make it more inclusive. That means, every citizen gets his freedom gets his minimum gets the his or her minimum facility to enrich his living conditions.

So, include it should be more inclusive in nature safe yes, safe for all categories of citizens say for aging people aged people, say for old citizens say for the women say for the children. So, safety is another factor. So, these are the factors you can say of the urban cities the sustainable cities.

The first thing is that the cities and facilities are it should be inclusive in nature that it should provide the equal access and opportunity to every stakeholder, every customer, every individual living in that city and the safety is another. Resilient whatever disasters what are the shortcomings what are the. So, what are the shocks? What are the scarcities? What are the things are coming up how the again this the system is so resilient.

Like for example, we can say Japan, Japan as you can say earthquake prone or the nature natural disaster prone city. But; however, they have built up the technology, they have built up the develop the technology and built up this their buildings and cities in such a resilient manner that they can you can say they can bear with, they can bear with all kinds of the natural disaster etcetera and come back to the universe.

Because they have used; they have used sustainable technology to build that cities. So, that we have to develop the resilient infrastructure to fight back all these kind of calamities and the natural disasters. So, resilient system and then again sustainable, sustainable in that renewable things are there sustainable is that is; that means, there is no scarcity of resources the resources will be created more and more can be conserved, can be renewed.

So, the so you can see the sustainable cities basic features can be it should be inclusive, satisfying the needs of all the stakeholders. Safety is another important factor, resilient infrastructure in terms of; in terms of absorbing the shock, in terms of fighting back to any kind of disaster calamity etcetera. And sustainable for because it will be you know it will be sustainable for the future generation in the sense of not only conserving the resources, but also creating the new ways of renewable energy renewable things like the water.

Water scarcity is that is a very common factor in urban cities. But again how can we explore the other you know scope and opportunities in the platforms of you know either saving water, sustainably using water or you can distribution of water so that is another.

Similarly energy distribution, similarly energy distribution, pollution control, pollution control the whatever pollution that pollution is being created through waste through you know through waste through other kinds of things usage. How can we process it reprocess it? So, waste management how can we manage it not only will reduce the volume and intensity of the pollution, but also we can explore a better way of you know minimizing the pollution so through technology.

So, that is a you can see these are some of the characteristic features of sustainable cities. For example, like cities can do a number of things to support the sustainable practices. What are these practices? How can we minimize? Minimize at least pollution minimize the explore resource depletion. Like make it is easy to get around without a car like for example, you can take all the plant cities, plant cities and the campuses etcetera.

Like for where living our living campuses instead of taking the car and the using the automobiles petrol you know diesel based automobiles. How if you can minimize we can minimize this kind of air pollution through you know through moving through bicycle, through walking all kinds of.

So, make it easy to go around without a car. If it is a within the reach short distance within the short distance. Then we can you know instead of using these four wheelers or the automobiles. We can use the cycles and the other kinds of or walking etceteras as an as a means of transport. Similarly add to the EV charging stations are there.

So, now it is more of more battery chargeable you know hydrogen cars and the battery chargeable electric cars are coming up. So, there must be the facilities for the frequent charging system in the community in the community. So, provide the access to public resources and the green spaces even within the city also how can we better use the space with the more greenery, wherever the opportunity and the space is there. How can we plant the greenery?.

So, to create more kind of you know purify the quality air quality through more creation of more oxygen etcetera. So, similarly improve the water conservation and the waste water management. Waste water management in the cities big cities then how you know how this waste water can be managed and can be converted to the different technological, mechanisms are there weed treatment or other kinds of things to process it and again improve the water conservation either rain water harvesting and other ways and means of conserving the you can say sweet water.

So, drinking water. So, support the urban farming implement the green architecture. So, nowadays urban farming has also take has also you know taken up the startups of a very important factor. Like you know roof farming roof garden roof gardening, roof farming and city farming.

These are also these are these have come up in the big way big way not only to; not only to you know ensure or not only to you know help us in creating or managing our you know household consumptions. In terms of you know in terms of rooftop gardening, in terms of vegetables, in terms of fruits in terms of etcetera.

But at the same time to enhance the greenery of the; greenery of the cities to compensate all compensate whatever the you know carbon footprints are that we are incurring in the daily day to day life. So, urban farming, then green architecture of that is primarily this. How can you make our buildings more greenery with you know by introducing some kinds of you know rooftop, garden rooftop, you know agriculture some of the greenery some agriculture, some you know kitchen garden some kitchen garden.

So, how to promote this rooftop farming and agriculture? Green architecture is also the slogan of these sustainable cities and the communities.

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The concept of **"Sustainable Cities and Communities"** of the World Bank's Urban, Disaster Risk Management, Resilience and Land Global Practice (GPURL) includes four key dimensions:

- First, Sustainable Communities are **environmentally sustainable** in terms of **cleanliness and efficiency**.
- Second, Sustainable communities are **resilient to social, economic, and natural shocks**. They are well prepared for **natural disasters**, which are increasing in intensity and frequency due to climate change.
- Third, **Sustainable Communities are inclusive communities**. They bring all dimensions of society and all groups of people—including the marginalized and vulnerable—into their markets, their services, and their development.
- And finally, Sustainable Communities are **competitive communities** that can **stay productive and generate jobs for members of the community**.

The slide features two images: the top one shows a modern building with a green roof and courtyard, and the bottom one shows a city skyline with a woman in a red and yellow patterned shirt in the foreground.

So, here can say so sustainable and cities and the communities also. That means, it is a it has been advocated by the World Bank. And now since last 10 to 12 since 2015 onwards you can say risk management, disaster risk management, resilience and the land and the resilience and the land global practices. It has become the key dimensions of sustainable cities and communities as being advocated by the World Bank.

So, therefore, we can say first of all sustainable community should be environmentally sustainable, in terms of its you know energy efficiency, in terms of its water sufficiency, in terms of cleanliness, in terms of safety, in terms of waste management all these things these are the priorities. Similarly secondly, the community should be the community that the society should be very much resilient to social, economic and natural shocks.

Like during the pandemic econofinancial final, economic shocks, economic setbacks are there, economic setbacks. Then social distance, social gap, social you know social communication; that means, social gap in the social networking communications etcetera.

So, this is a setback for the social connectedness, social relationship that is also there. So, for absorbing for facing these all kinds of natural shocks how can we make our communities more resilient and sustainable that is one thing. So, that is why you must be very well prepared to face all these kind of natural disasters.

And how can we again how can we, how can we reduce the intensity and frequency of these kind of disasters and not getting ours involved not getting not making ourself the reason or the factors of manmade disasters and taking care of the environment. So, that we can reduce this impact of negative impact of climate change.

So, the next is that sustainable communities are again the inclusive community the inclusive community takes into account. Now all sections of the persons all sections of the persons not only in terms of socioeconomic status, but in terms of age groups, in terms of like the who are the like who are the marginalized groups, who the minorities, who the vulnerable groups.

Like the children and the aged, aged persons they senior citizens, they are the vulnerable groups. Again in terms of you know in terms of the economic market also, market services. So, how this; that means, inclusive community means you have to the society has to sustainable society they have to care for all groups of people, all stakeholders. all And all then hence to serve their to serve to take care of their take care of their vulnerability and look for their look forward to their to protect them to care for them.

So, it has to definitely; that means, inclusive community means it cares for everybody all the stakeholders. Then another is that sustainable communities are yes. Of course, there are competitive communities, in the sense that not just to maintain the cleanliness, not just to maintain conserve the resources, but to stay themselves as productive, as the productive.

In terms of you know in terms of their resources, in terms of their skills, in terms their competencies, in terms of creating the jobs, in terms of sustainable growth and economy. So, that is why so how the this kind of things also sustainable cities and communities also encourages.

It also motivates and encourages the people to be to stay to be to stay back with the to be productive, to be protective, to be caring and caring and to be creative in the sense creating more jobs more opportunities for everybody. But thing is that, but the all these things also it focuses on the collective wellbeing.

So, collective wellbeing, community wellbeing it is not just individuals development. So, that we can minimize the gap minimize the poor and rich gap, minimize the

socioeconomic gaps, gaps in the community. So, that the; that means, almost all the citizens, all the stakeholders are leading a very happy prosperous and the healthy life. So, that is the main focus of the goal of the sustainable communities.

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A true eco-city will need to address the social, environmental and economic impact of sustainability.

Characteristics of a Sustainable City

1. **Public transportation:** Electric trolleybuses, Metro systems, Underground railways, Maglev trains
2. **Walkable and bike-able neighborhoods:** Pedestrian bridges, Bike path networks, Connected urban grids, Shared micro-mobility
3. **Vehicle charging stations:** Electric vehicle, Hydrogen powered car
4. **Solar farms**
5. **Green buildings:** Smart heating and cooling systems, Natural building materials, Enhanced ventilation and insulation, Solar panels, Green roofs
6. **Food production:** Eco-friendly, organic food & vegetables

Sustainable city solutions
for a greener urban world

So, the next is that so that is why you can say a true ecocity sustainable city definitely will need to address the. So, as we know the environmental, social, environmental and economic impact of sustainability. So, when we talk about sustainability society means automatically it takes into account takes into account these three aspects.

Socially it should be community should be sustainable inclusive etcetera and economically viable, economical growth, prosperity is there and environmentally also it is also very healthy it is safe it is sustainable. So then what are the characteristics of sustainable cities?

Yes, as we have already discussed public transportation. So, public transportation should focus on minimizing the carbon footprints. In terms of; in terms of more uses of electric trolleybuses, metro systems, underground railways, you know CNG like in CNG you know minima CNG autos and the gases.

How to minimize? How to minimize the carbon footprint? So, that kind of you know vehicles and transport facilities we have to focus, we have to create. Similarly, walkable

and the bikeable neighborhoods if it is within the reach how the you know how the citizens, how the customers.

They can move into the market and for their day to day activities either by going by a cycle or walking or in a bikeable neighborhoods. That means, within the nowadays all with the motorcycles, two wheelers. Again nowadays also two wheelers also coming of battery charged battery charged two wheelers, cars etcetera.

So, that is not only that again sometimes if it is possible in order to avoid the crowds, in order to avoid the you know this you know traffic congestion etcetera. So, there should be separate ways, separate ways and paths like you know pedestrian. For the pedestrian bridges will be there. There should be bike path network there should be urban grids and for the micro mobility like the subways, like the overhead walking, walking bridge foot bridge. So, all these kind of facilities are also should be explored.

So, vehicle charging stations they should be situated they should be situated, this would be established from you know within the approachable distance; that means, in the city across the cities in the very key places. So, electric vehicles hydrogen powered car, battery chargeable two wheelers etcetera these are to be promoted and also their charging stations should be established in the nearby areas.

Solar farms definitely solar energy solar farms how to solar farms are the you know major you can say major source of you know energy creation, energy supply etcetera supply. So, now, the green buildings nowadays we are also focusing more on a green building. So, what are the natures of the green buildings? Yet first thing is that smart heat and cooling system. Now in every in the multi storeyed buildings now we are using the AC's and all kinds of the cooling system.

So all these are also energy efficient system like you know nowadays also the TV's, fridge, refrigerator and coolers all kinds of that are you know start. Start that means, start systems in the sense minimum energy and minimum energy consumptions, minimum energy consumption, consumption or energy efficient system.

Seem starting from our electricity bulbs to AC's to coolers to all the home their household amenities, even the washing machine to all kinds of electrical gadgets and the

amenities the that we are using at home in the cities, so our energy efficiency as having the energy efficiency.

So, how to the green buildings should take into account? The smart heating and cooling system with minimum energy, energy consumption, then natural building materials, the raw materials the infrastructure materials that should be also very robust and resilient. Similarly enhancing the ventilation and the insulation facilities, solar panels, green roofs all these kind of things so green building. So, greenery approach is that ecofriendly approach. Ecofriendly as much as sustainable as much as conservation of resources as much as; that means; minimizing minimum pollution.

So, that is how to focus on the green building. So, green buildings it is a very important part in the urban infrastructure and city planning. Then the food production food production nowadays you know nowadays we are agriculture also we are focusing more on organic foods, vegetables, ecofriendly you know ecofriendly, agriculture farming system. So, these are some of the you know key characteristics of sustainable cities. So, now I am concluding here in the next class we will continue with this.

Thank you very much.