System Design for Sustainability
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Week - 11
Lecture – 01
Other Design for Sustainability Tools and approaches - Cities and Communities

So, hello everybody, today we are going to discuss about Sustainability Tools and Approaches for in the context of Cities and Communities. So, in this particular context we will be discussing about circles of sustainability.

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So, if you remember in the very 1st week of this particular course, in the 2nd lecture we had touched upon this concept, circles of sustainability. When we were trying to discuss about various sustainability approaches in different contexts, and trying to understand the meaning of sustainability. Then we will look at the 4 circles; which help you to which a part of this method which is circles of sustainability.

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This lecture is prepared using the content from this following website. You can go to this particular website and read through more about each of the topics that will be discussed in this lecture. Also the website contains many other tools, project examples and so on, which can be very helpful for you if you want to learn more about this particular approach.

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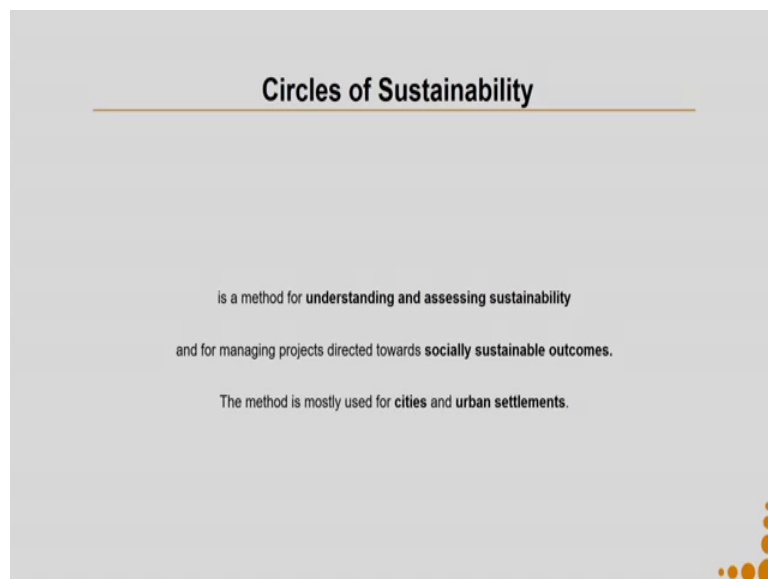
So, circles of sustainability, what is it? So, it is a method for understanding and assessing sustainability and for managing projects directed towards socially sustainable outcomes.

So, that is very important, the socially sustainable outcomes part. The method is mostly used for cities and urban settlements, because cities and urban settlement they are made up of human beings who populate those cities and urban settlements and make them the way they are. And hence, in order to achieve sustainable outcomes over their the social dimension is very important.

Of course, we are not saying that the economic and the environmental dimension are not important, they are very important as well, but the social dimension takes big priority. So, this particular method has been developed in a manner that the projects can be directed towards socially sustainable outcomes along with a focus on economic as well as the ecological aspects.

In this method you will also see that the social dimension has been further bifurcated into 2 dimensions; that is political and culture. That shows how important that is so rather than 3 dimensions here in circles of sustainability we talk about 4 dimensions ecology, economics, political and cultural.
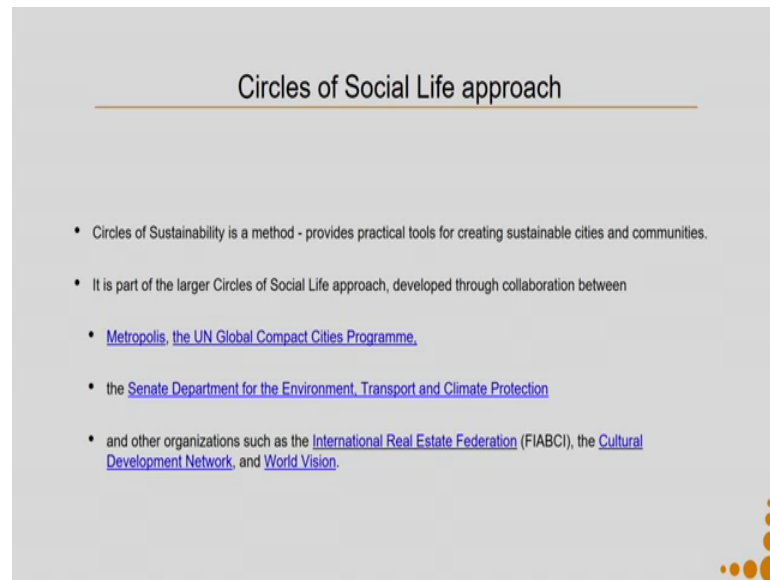
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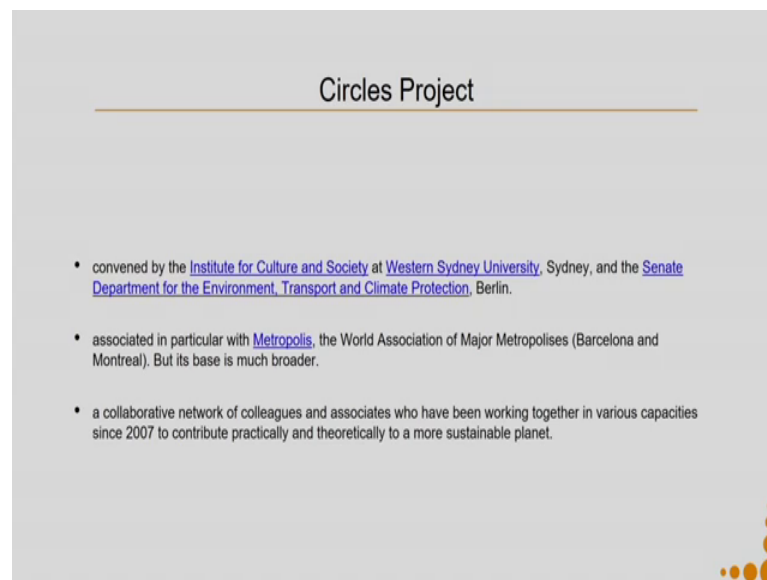
So, the method originates from the circles project, the circles project towards convened by the institute for culture and society at Western Sydney University and the senate department for the environment transport and climate protection in Berlin. There are many associated partners in particular the metropolis, the world association for major metropolises.

But, it is base has now broaden to a great extent. Collaborative network of colleagues and associates together part of this particular project, since 2007 that contributing towards theoretical development, case study development and so on.

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So, circles of social life approach is something from which this particular circles of sustainability comes up. So, circles of sustainability is a method which provides practical tools for creating sustainable cities and communities. It is part of the larger circles of social life approach developed through collaboration between various organizations like, the metropolis the UN global compact cities programme. The senate department for the environment transport and climate protection and other organization such as international real estate federation, cultural development network and world vision.

So, what is circles of social life? It is an approach that guides engaged and collaborative practice in making our cities, locals and organizations more sustainable, resilient, adaptable and liveable. And circles of sustainability is a method in this particular approach. So, how does this circles approach work?
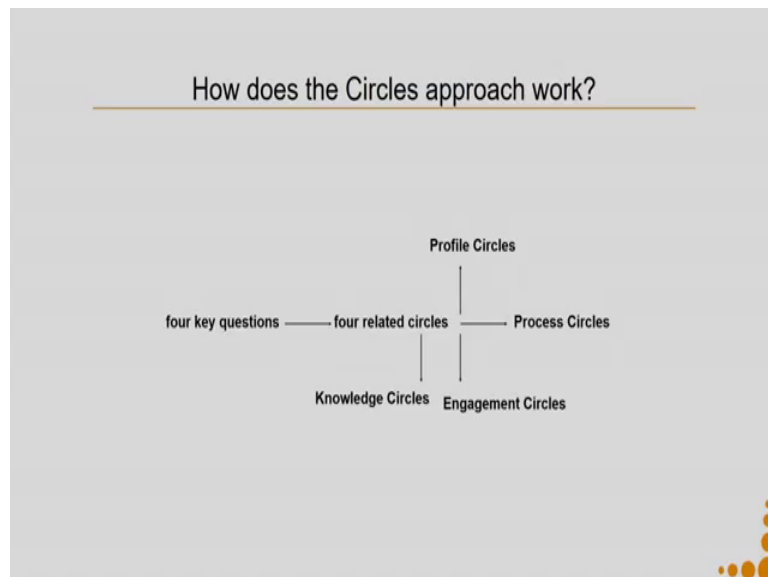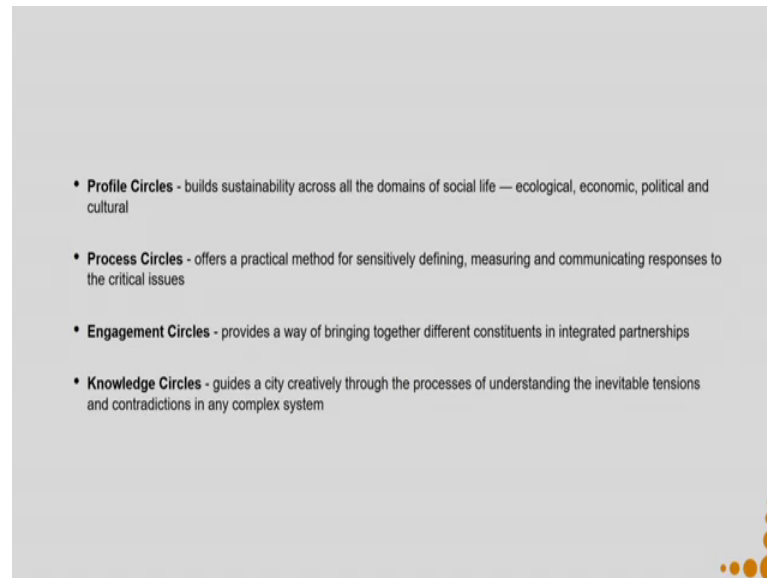
So, there are four key questions which are supposed to be ask, each of them related to the four circles. What are these four circles? So, the four circle is called as the profile circles,

the second is called as the process circles. The third is called as engagement circles and the fourth is called as knowledge circles.

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- **Profile Circles** - builds sustainability across all the domains of social life — ecological, economic, political and cultural

- **Process Circles** - offers a practical method for sensitively defining, measuring and communicating responses to the critical issues

- **Engagement Circles** - provides a way of bringing together different constituents in integrated partnerships

- **Knowledge Circles** - guides a city creatively through the processes of understanding the inevitable tensions and contradictions in any complex system

So, profile circles it helps to build sustainability across all domains of social life. So, as I as we have been discussing during the entire duration of this course, dimensions of sustainability, ecology, economy and social and in this particular context since our focus is on social is aspects is a quite big; hence we divide the social into 2 political and cultural.

It also make sense because, now we are going to talk about cities and communities specifically. Hence, the bifurcation into political and cultural of the social dimension becomes very effective and efficient way of dealing with this particular context. So, profile circles deals with this particular aspect. Next comes the process circles, it offers a practical method for sensitively defining measuring and communicating responses to critical issues. We will get into details of each of these processes and that will make it more clear what it implies.

Then comes engagement circles, because, we are talking about cities and communities we need to bring in engagement. So, the engagement circle provides a way of bringing together different constituents. These might be different communities, these might be different kinds of organizations, these kind be different individuals and so on so, the different constituents in integrated partnerships. The fourth circle is knowledge circle, it

guides a city creatively through the processes of understanding the inevitable tensions and contradictions in any complex system. So, all cities, all communities, all settlements very complex system so, the knowledge circle deals with understanding how people deal with this particular complex system.

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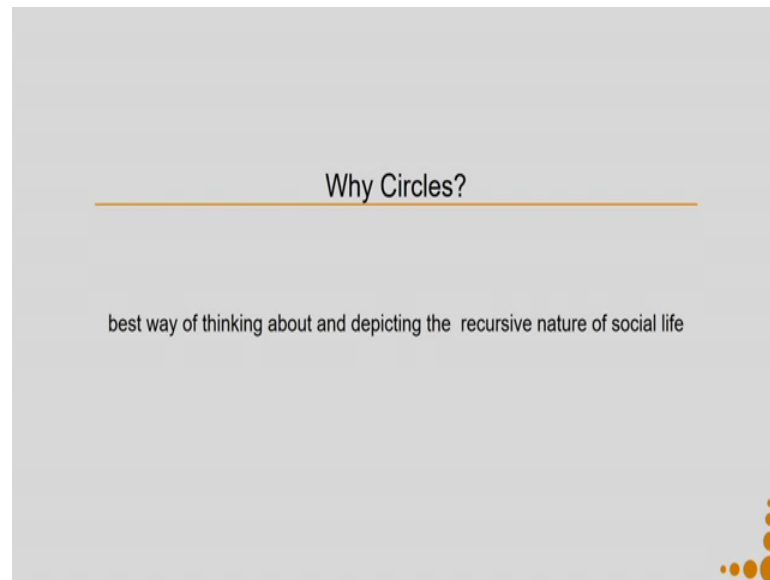
You must be wondering why circles? So, when we are talking about social life, the best way of thinking about it and about and how do we depict it is in recursive nature, something which goes in circles. Let us take an example, say for example, a city identifies that plastics are a big source of pollution in that particular city. And this major chunk of plastic pollution is caused because of all the poly bags which I used by people to purchase their grocery and all other such things.

So, as a result of this the city authority is decide that let us say that in order to buy your products in a poly bag, you need to pay for the poly bag. So, for a small poly bag say 4 rupees for a large poly bag say 15 rupees. When this particular law comes in this, law comes in to effect because the city of city governance body observed that pollution is being caused because of this particular object.

Now, people when this new rule comes they will react to this particular law. Say for example, people feel that when I am buying a product which is worth 500 rupees, so I bought 500 rupees of products and for housing that 500 rupees product, I have to pay 15 rupees extra for that big poly bag, which is not a very big deal.

So, it is more convenient, I do not have to carry my bags. So, say in the 15 rupees category there was no reduction in plastic bag consumption. But in the 4 rupees category, there was in initial depth in consumption, because may be the small poly bags I used for buying smaller quantity, say it is used for buying vegetables which is might be worth just 100 rupees. So, people might be thinking I do not want to spend this 4 rupees. So, initially they started bringing their own bags so, depth in pollution due to poly bags was observed in the small bag category.

In the large bag category, it was observed maybe because it is 15 rupees of people are not throwing it away, they are keeping it with them. But, eventually people get used to it and maybe after few months time peoples give in to the temptation of convenience. So, that is do not carry your on bags, pay the 4 rupees, pay the 15 rupees by the new bag and still keep on discarding them. Now, the city government again observe that the pollution level which pollution caused due to poly bags which saw a dip, it again went up to the previous level of the law. So, they realize this law does not work let us bring in a new law we ban all kinds of poly bags.

Now, no shop is allowed to give products in a poly bag. They have to use newspaper or they will or the customer has to buy bring their own bags. Again they will be change in behavior amongst consumers, amongst the shop owners. Also it will depend how strictly the city is in oozing these laws, or the conducting regular check. So, you can see this whole social life was so recursive, laws kept on being change people responded and certain manners because of the laws, which again influence the laws bag.

So, that is why the concept of circles, because best way of thinking about and depicting recursive nature of social life is in circles and not in linear lines. So, it is not like you add 10 grams of sugar into water which makes water sweet by certain degree or a deserves to a certain degree. And then I can say, I can have a linear line of cause and effect, but here in social life it is recursive hence, the concept of circles.

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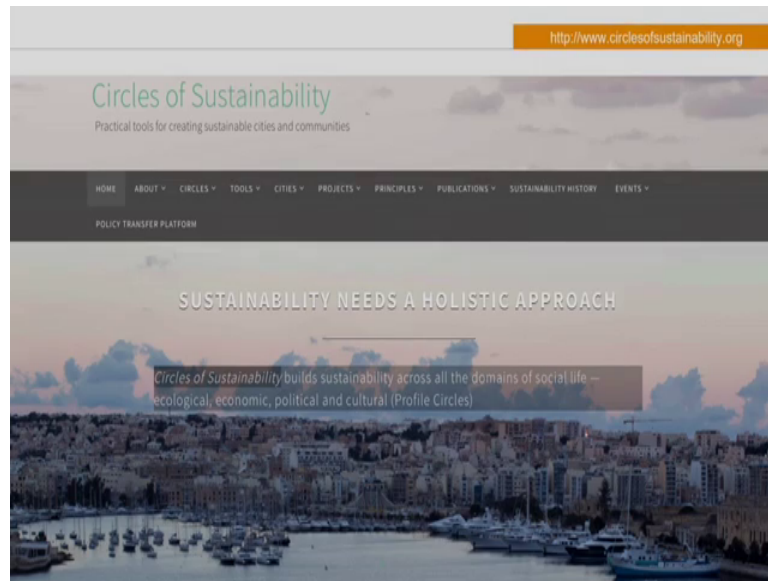
So, this is the website, they also have a book which I will give show you the link to the book at the end of the lecture and if you are interested you can also read through that book it is not a compulsory material for this course. So, this particular website talks about all the circles so, this one has all the circles the tools the cities, where it has been used projects principles publications and so on.

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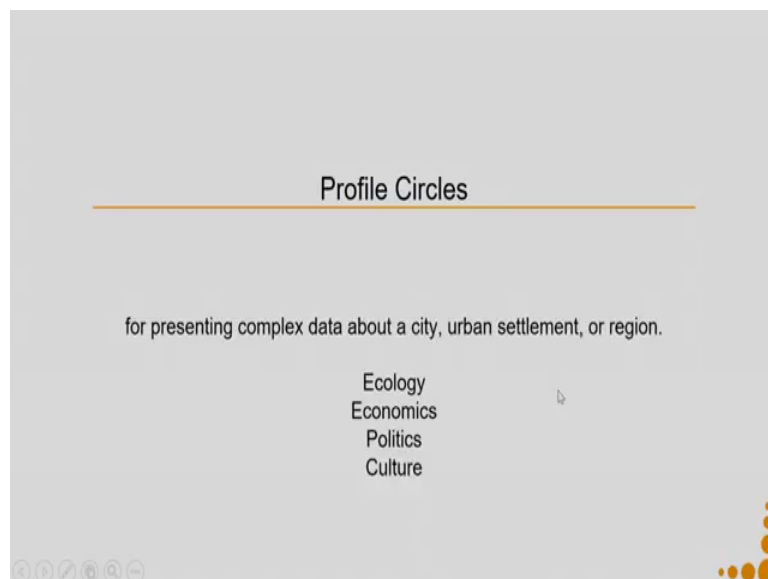
So, let us start with the circles so, we will first discuss about the profile circles. So, profile circles as we said they are meant for presenting complex data about a city urban

settlement or region. What are these complex data? They are about ecology, economics, politics and culture of that particular city urban settlement or region.
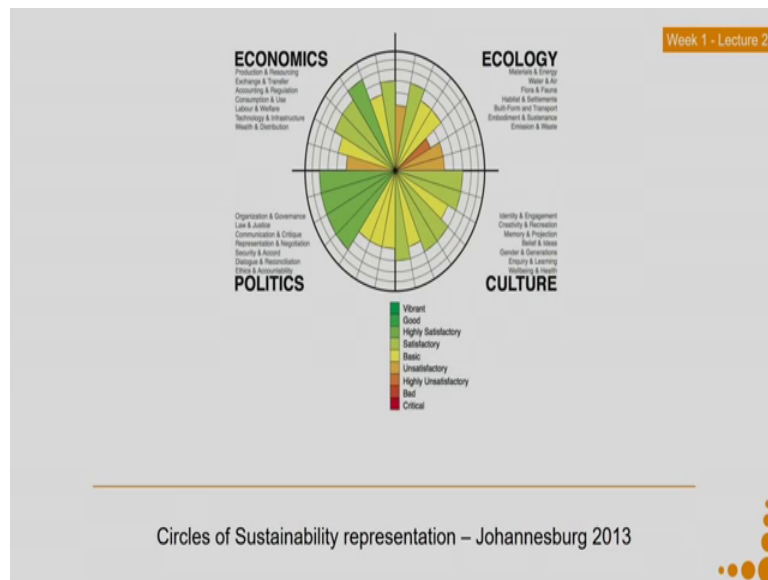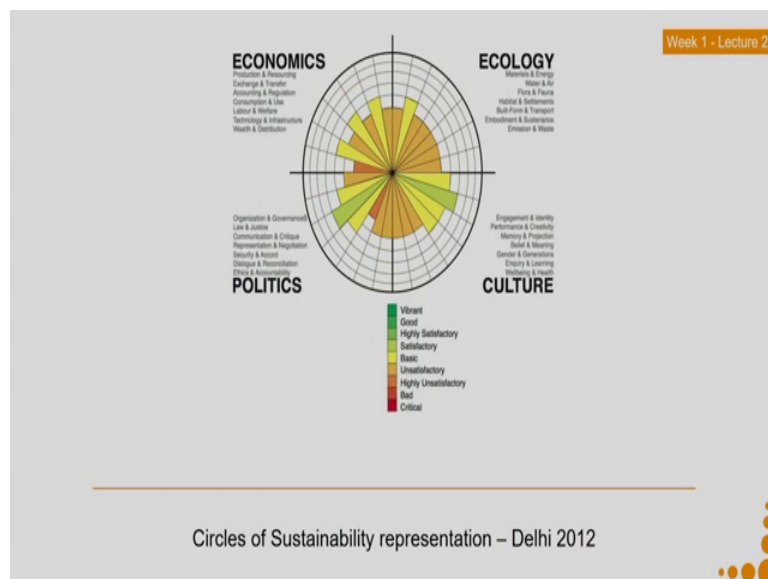
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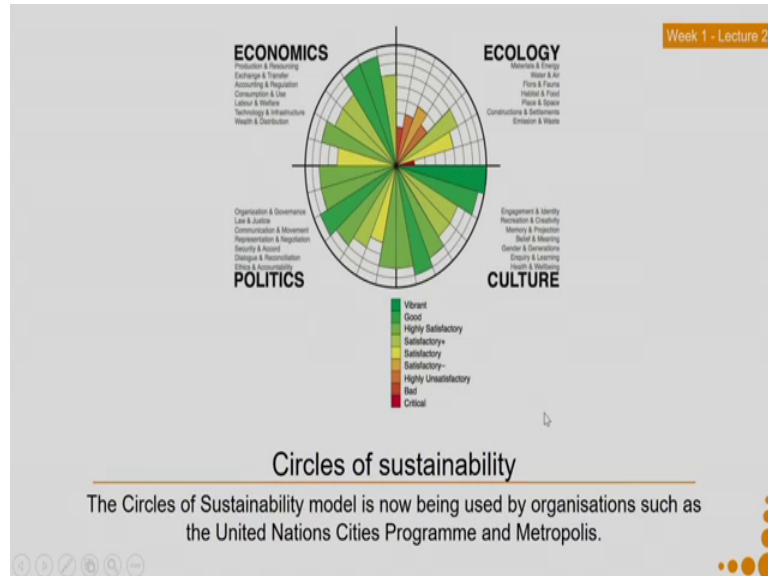
So, let us do quick recap from our week 1 lecture 2. So, this is what we presented circles of sustainability this model is now being used by organizations such as the United Nations, cities programmes and metropolis. So, here you can see that this is a kind of circular diagram which here where you can do rating.

So, the rating starts from vibrant up to critical. Then I have my 4 dimensions ecology culture politics and economics. And say in ecology the 1st one stands for materials and energy. The 2nd one stands for water and air so, I can rate in terms of material and energy, I can read that my that particular city is in a critical situation because it is red. Whereas, let us say if I try to read economics and I see wealth and distribution so, it is over here which means it is at a satisfactory level. So, this was the circles of sustainability representation of Melbourne city in 2011, this one is from Johannesburg from 2013, this one is for Delhi from 2012.

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Circles of Sustainability representation – Johannesburg 2013

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Circles of Sustainability representation – Delhi 2012

So, when you place all these city maps close to each other you can have a good comparative study. It helps in visualizing it quickly tells you where all we need to do improvements and where we are performing well.

So, let us try to understand each of these dimensions. So, the 1st dimension the ecology, the ecological domain is defined as the practices and meanings that occur across the intersection between the social and the natural realms, focusing on the important dimension of human engagement with and within nature, but also including the built environment. So, as we had started with this lecture, I told you that it was very important that the circles of sustainability it is major focus was social sustainability.

So, even when we are looking into ecology and economics, we are looking it with respect to the social realm, with respect to the, since a ecology it is social and the natural realms their interaction. So, how do we do that? We will see how about the human engagement with and within nature. So, how I am interacting with the nature and inside the nature within the nature, and it also includes the built environment.

As we discussed in our lecture on sustainability tools for architecture you already know that, about 30 to 40 percent of global energy consumption is happening due to our built environment buildings. So, in the dimension ecology the sub dimensions are materials and energy water and air flora and fauna habitat and settlements, built form and transport embodiment and sustenance emission and waste.

Materials and Energy	Availability and Abundance	Habitat and Settlements	Topography and Liveability
	Soil and Fertility		Original Habitat and Native Vegetation
	Minerals and Metals		Parklands and Reserves
	Electricity and Gas		Land-use and Building
	Petroleum and Biofuels		Abode and Housing
	Renewables and Recyclables		Maintenance and Retrofitting
	Monitoring and Reflection		Monitoring and Reflection
Water and Air	Vitality and Viability	Built-Form and Transport	Orientation and Spread
	Water Quality and Potability		Proximity and Access
	Air Quality and Respiration		Mass Transit and Public Transport
	Climate and Temperature		Motorized Transport and Roads
	Greenhouse Gases and Carbon		Non-motorized Transport and Walking Paths
	Adaptation and Mitigation Processes		Seaports and Airports
	Monitoring and Reflection		Monitoring and Reflection
Flora and Fauna	Complexity and Resilience	Embodiment and Sustenance	Physical Health and Vitality
	Biodiversity and Ecosystem Diversity		Reproduction and Mortality
	Plants and Insects		Exercise and Fitness
	Trees and Shrubs		Hygiene and Diet
	Wild Animals and Birds		Nutrition and Nourishment
	Domestic Animals and Species Relations		Agriculture and Husbandry
	Monitoring and Reflection		Monitoring and Evaluation

Each of these are further divided into 7 subcategories. So, like materials and energy it consists of availability and abundance. I think the meanings are pretty much clear so, I will not go into the details of the meaning of these words. When we go through this entire list, you can see how beautiful connection is between a city or a region or a community and the human element involved and it is interaction with the natural realm.

So, in materials energy we have availability and abundance, soil and it is fertility, minerals and metals, electricity and gas, petroleum and biofuels, renewables and recyclables. The last point of each and every category is monitoring and reflection. They are both very important in order to achieve sustainability whether they are present or not. Then comes water and air, vitality and viability, water quality and portability. Portability is whether that water is drinkable or not, air quality and respiration, climate and temperature, green house gases and carbon, adaptation and mitigation processes, monitoring and reflection.

Then comes flora and fauna, which consists of complexity and resilience. Biodiversity and ecosystem diversity, plants and insects trees and shrubs, wild animals and birds, domestic animals and species relations, monitoring and reflection. Then comes habitat and settlement, it consists of topography and liveability, original habitat and native vegetation, parklands and reserves, land use and building, abode and housing, maintenance and retrofitting, monitoring and reflection.

Then comes the built form and transport, orientation and spread, proximity and access mass transit and public transport, motorized transport and roads non-motorized transport and walking paths, seaports and airports monitoring and reflection. The next one the 6th one is embodiment and sustenance, physical health and vitality reproduction and mortality, exercise and fitness hygiene and diet nutrition and nourishment, agriculture and husbandry monitoring and evaluation.

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Then the final one is emissions and waste; which consists of pollution and contamination, hard waste and rubbish, sewerage and sanitation, drainage and effluence, processing and compositing, recycling and reuse monitoring and evaluation.

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The next dimension in the profile circles is economics. The economic domain is defined as the practices and meanings associated with the production use and management of resources; where the concept of resources is used in the broadest sense of that word. So, how do I define resources? So, if you see through this list you will get to know how broadly resource has been define.

So, when I see production and resourcing, there is one type of resources, exchange and transfer, we can do many types of exchange and transfer. So, let us go directly into the next slide which details out and gives you a bigger picture of all the different types of resources that we are talking about in the economics domain.

Production and Resourcing	Prosperity and Resilience		Consumption and Use	Appropriate Use and Re-use
	Manufacture and Fabrication			Food and Drink
	Extraction and Harvesting			Goods and Services
	Art and Craft			Water and Electricity
	Design and Innovation			Petroleum and Metals
	Human and Physical Resources			Promotion and Dissemination
	Monitoring and Reflection			Monitoring and Reflection
Exchange and Transfer	Reciprocity and Mutuality		Labour and Welfare	Livelihoods and Work
	Goods and Services			Connection and Vocation
	Finance and Taxes			Participation and Equity
	Trade and Tourism			Capacity and Productivity
	Aid and Remittances			Health and Safety
	Debt and Liability			Care and Support
	Monitoring and Reflection			Monitoring and Reflection
Accounting and Regulation	Transparency and Fairness		Technology and Infrastructure	Appropriateness and Robustness
	Finance and Money			Communications and Information
	Goods and Services			Transport and Movement
	Land and Property			Construction and Building
	Labour and Employment			Education and Training
	Taxes and Levies			Medicine and Health Treatment
	Monitoring and Reflection			Monitoring and Reflection

So, production and resourcing we are talking about prosperity and resilience, manufacture and fabrication extraction and harvesting. Say for example, they might be a situation as particular region or a city it is in completely not involved into any kind of an extraction process, they might be involved in some kind of a harvesting process. So, whatever the situation applicable is, then art and craft design and innovation human and physical resources. So, you see we started with physical resources infrastructure related resources and now when we talk about human and physical resources, we are also talking about human resources.
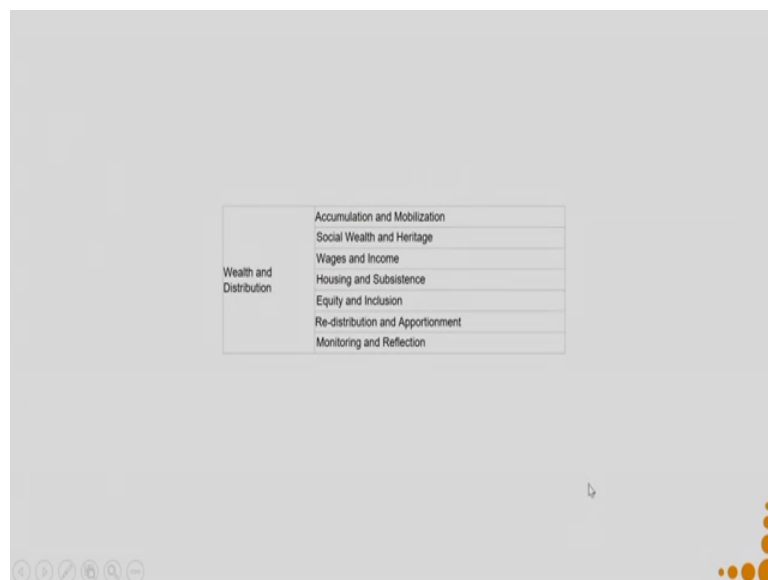
And it is relationship between with physical resources, the monitoring and reflection. Then comes exchange and transfer so, reciprocity and mutuality, goods and services, finance and taxes, now you can see we have brought in the financial resources also over here, trade and tourism, aid and remittance dept and liability, finally monitoring and reflection.

Then comes accounting and regularation regulation, transparency and fairness finance and money, goods and services, land and property, labor and employment, taxes and levies monitoring and reflection. Then comes consumption and use, aAppropriate use and re use, food and drink, goods and services, water and electricity, petroleum and metals. So, when we were talking about in the previous slide, use of petroleum and other fuels which came in the ecological dimension when we were talking about that

dimension, we would be the assessing the situation as per in terms of ecology. When we are in this particular category which is about economics, we will be analyzing petroleum and metals with respect to consumption and use.

Then comes promotion and dissemination monitoring and reflection, labour and welfare; livelihoods and work, connection and vocation, participation and equity, capacity and productivity, health and safety, care and support, monitoring and reflection. The 6 th one is technology and infrastructure so, appropriateness and robustness, communications and information, transport and movement, construction and building, education and training, medicine and health treatment, monitoring and reflection.

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The final one is about wealth and distribution. It talks about accumulation and mobilization, social wealth and heritage, wages and income, housing and subsistence, equity and inclusion, redistribution and apportionment in the monitoring and reflection.

Let us go to the dimension called politics. So, the political is defined as the practices and meanings associated with basic issues of social power, such as organization, authorization, legitimization and regulation. So, politics does not imply over here about political parties. What it implies is the issues of social power which might be as part of an organization, because every organization, every family also has different layers of social power with each and every individual with each and every entity.

So, the domain it deals with practices and meanings associated with basic issues of social power, such as an organizations and authorization and legitimation and regulation. The parameters of this area extend beyond the conventional sense of politics to include not only issues of public and private governance, but more broadly social relations in general. So, it consists of organizations and governance, law and justice, communication and critique, representation and negotiations, security and accord, dialogue and reconciliation, ethics and accountability.

Organisation and Governance	Legitimacy and Respect		Representation and Negotiation	Agency and Advocacy
	Leadership and Agency			Participation and Inclusion
	Planning and Vision			Democracy and Liberty
	Administration and Bureaucracy			Access and Consultation
	Authority and Sovereignty			Civility and Comity
	Transparency and Clarity			Contestation and Standing
	Monitoring and Reflection			Monitoring and Reflection
Law and Justice	Rights and Rules		Security and Accord	Human Security and Defence
	Order and Civility			Safety and Support
	Obligations and Responsibilities			Personal and Domestic Security
	Impartiality and Equality			Protection and Shelter
	Fairness and Prudence			Refuge and Sanctuary
	Judgement and Penalty			Insurance and Assurance
	Monitoring and Reflection			Monitoring and Reflection
Communication and Critique	Interchange and Expression		Dialogue and Reconciliation	Process and Recognition
	News and Information			Truth and Verity
	Accessibility and Openness			Mediation and Intercession
	Opinion and Analysis			Trust and Faith
	Dissent and Protest			Remembrance and Redemption
	Privacy and Respect			Reception and Hospitality
	Monitoring and Reflection			Monitoring and Reflection

When you go through this whole list and when we go through the more granulated list, you can see more and detail that how we are talking about social power, the issues of social power. So, when I am talking about organization and governance, I am talking about legitimacy as well as respect, leadership and agency, planning and vision, administration and bureaucracy, authority and sovereignty, transparency and clarity and monitoring and reflection.

When I talk about law and justice, I am talking about rights and rules, order and civility, obligations and responsibilities, impartiality and equality, fairness and prudence, judgment and penalty, monitoring and reflection. Communication and critique: interchange and expression, news and information, accessibility and openness, opinion and analysis, dissent and protest, privacy and respect, monitoring and reflection.

Let us go to representation and negotiation, it is about agency and advocacy, participation and inclusion, democracy and liberty, access and consultation, civility and community, contestation and standing monitoring and reflection. You can see with this final granularities into with each of these sub categories have been defined, they define the scope of that particular topic.

And you can see how nicely they are covering a wide spectrum of all forms of social power, which can be take, which need to be taken into consideration in the context of sustainability for cities or any kind of settle urban settlements. Then comes so, the

security and accord so, human security and defense safety and support, personnel and domestic security, protection and shelter, refuge and sanctuary, insurance and assurance, monitoring and reflection. Then comes dialogue and conciliation; where we are talking about processes and recognition, truth and variety, mediation and intercession, truth and faith, remembrance and redemption, reception and hospitality, monitoring and reflection.

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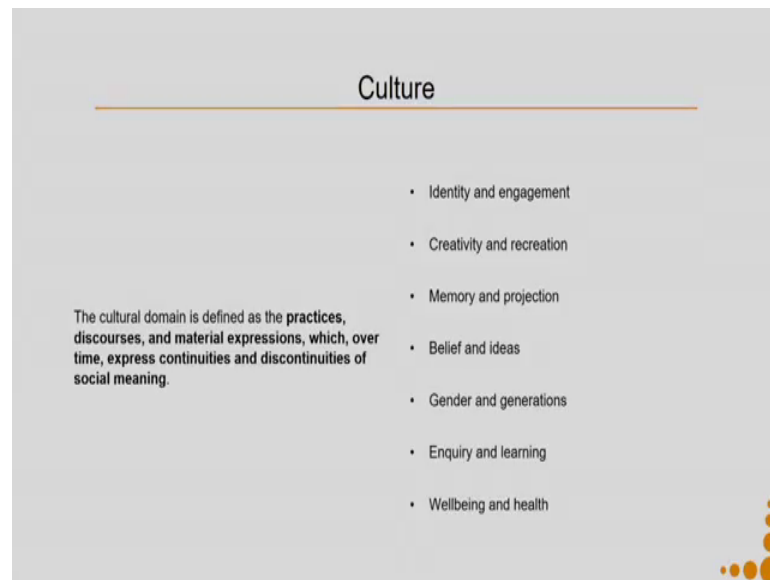

Finally, our last one which is the ethics and accountability, it talks about principles and protocols, obligations and responsibility, integrity and virtue, observance and visibility, prescription and contention, acquittal and consequence, monitoring and reflection.

The 4th dimension of the profile circle is culture. So, the culture domain is defined as the practices, discourses, discourses are about all materials which can be used for educational purposes. So, because culture is something that is learnt and hence we are talking about practices, you learn through practices, discourses you also learn through learning material and material expressions. So, say for example, a particular community can be defined in it can be understood or can be can create it is own definition with say for example, the kind of materials they on.

The way they organize their house, the kind of furniture that they own so, culture can be also learnt or understood through the material expressions. So, the cultural domain is defined as the practices, discourses and material expressions which overtime, express continuities and discontinuities of social meaning. Not necessarily all cultural aspects like practices discourses and material expressions they do not have like infinite continuity. They have certain continuity certain aspects live for along duration, certain aspects discontinue more quickly.

So, these aspects and there continuities and discontinuities and their social meaning created as a result of that. So, say for example, it consists of identity and engagement, creativity and recreation, memory and projection, belief and ideas, gender and generations, enquiry and learning, well being in health.

So, in identity and engagement we are talking about diversity and difference, belonging and community, ethnicity and language, a religion and faith, friendship and affinity, home and place, monitoring and reflection, creativity and recreation, aesthetics and design, performance and representation, innovation and adaptation, celebrations and festivals, sport and play, leisure and relaxation monitoring and reflection.

When you go through this all the scope of it, you can see how brought the meaning of culture is, you can see all the practices. So, say for examples play can be practice, performance can be a practice which are culturally determine. Whereas, when we want to talk about material expressions, we are talking about home and place. Because home and place they will consist of many different materials which give you the material expression which might be peculiar to that particular cultures culture and it might represent some kind of continuity and discontinuity of social meanings.

Then comes memory and projection, tradition and authenticity. So, when we talk about tradition and authenticity, it might also involve things like practices discourses as well as the material expression, heritage and inheritance, history and records, indignity and custom, imagination and hope, inspiration and vision, monitoring and reflection. Then comes beliefs and ideas, knowledge and interpretation, ideology and imaginaries, reason and rationalization, religiosity and spirituality rituals and symbols, emotions and passions, monitoring and reflection.

Very important in understanding social meanings is gender and generations, equality and respect, sexuality and desire, family and kinship, birth and babyhood, childhood and youth, mortality and care, monitoring and reflection. A simple thing like birth and babyhood if you look up in different cultures, they have different meanings, they have different practices associated with in. Enquiry and learning, curiosity and discovery, deliberation and debate, research and application, teaching and training, writing and codification, meditation and reflexivity and finally, monitoring and reflection.

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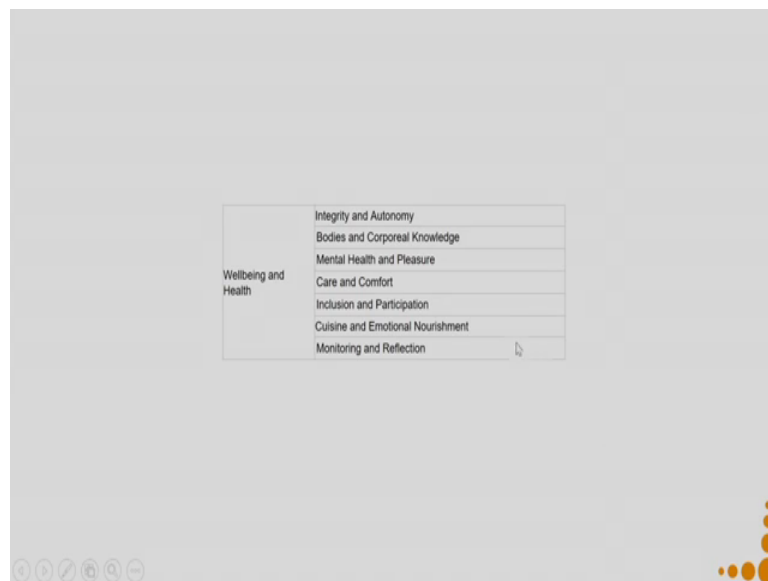
The last aspect is well being and health which consists of integrity and autonomy, bodies and corporeal knowledge, mental health and pleasure, care and comfort, inclusion and participation, cuisines and emotional nourishment and monitoring and reflection.
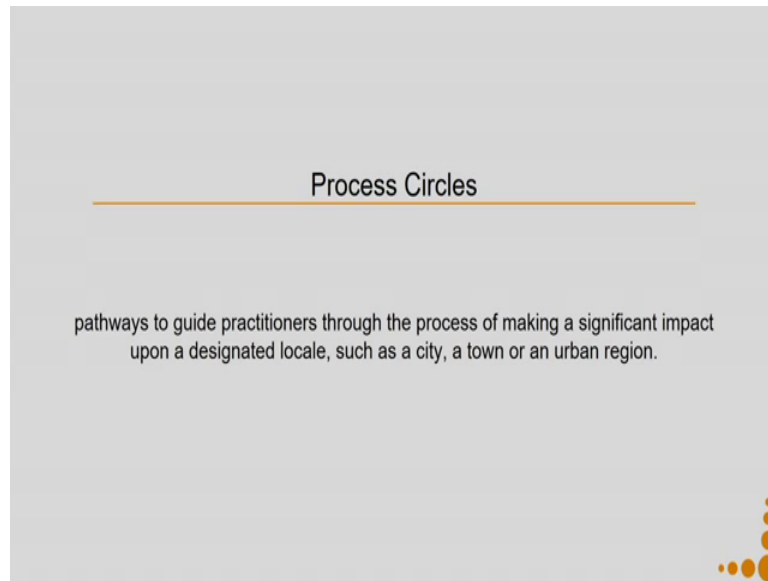
That was about the profile circles, now let us come to the process circles. So, process circles are pathways to guide practitioners through the process of making a significant impact upon a designated locale; such as a city a town or an urban region. So, say you as a designer who want to create the impact the sustainable impact; you will have to follow certain processes to create this particular impact so, the process circle deals with the same.
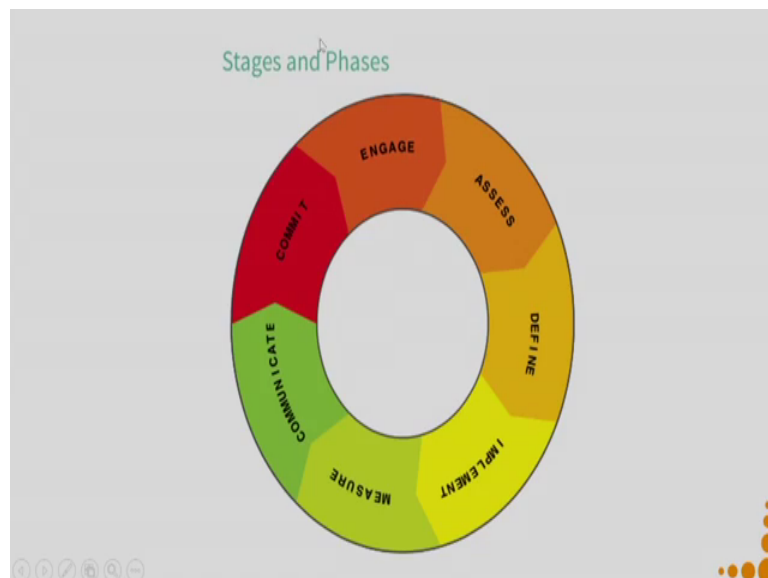
So, the process circle consists of stages and phases so, the stages and phases are commit, engage, assess, define implement measure and communicate.

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| STAGE	PHASE	ACTION	TOOL
COMMIT	Affirm commitment to making a difference		
	Establish management structure		
	Choose framing considerations	Choose general issue	
		Choose general objectives	
		Choose spatial and temporal frame	
	Resource the project		
ENGAGE	Consult key constituent groups and individuals		
	Entrust collaborators and form a critical reference group		
	Empower local communities	Seek critical community feedback	
		Adjust chosen objectives	
	Accord recognition to partners		
ASSESS	Determine knowledge and resources	Determine local knowledge	Knowledge Profile Process
		Determine strengths and weaknesses	
		Determine contested social themes	Social Themes Process
	Analyse data and documents	Analyze existing existing public data	
		Analyze existing policy documents and research	
		Analyze existing indicators	
	Research social context	Research community responses	Social Life Questionnaire
		Research urban context	Urban Profile Process
		Research individual responses	Strategic interviews
	Project outcomes	Project future scenarios	Scenarios Projection Process
		Project program scenarios	Intelligent Cities Simulator

So, each of these stage consists of certain phases. You can take these actions and some of these actions can be taken using certain tools which have been designed in the scope of this particular circles project.

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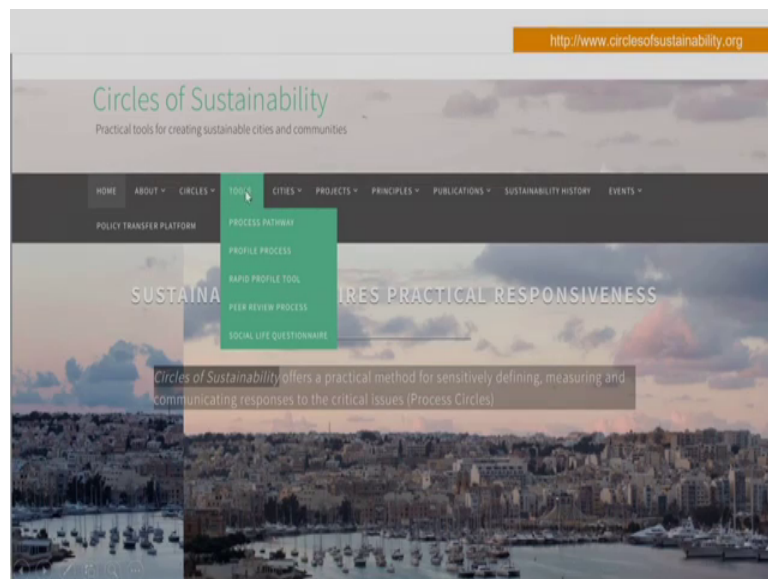
So, the website gives you an idea, so, if we go to this particular website, here you can see tools you can see many of these tools available over here in this particular section. So, let

us see what do we what are the phases involved in the commit? So, commit is the stage one where you try to get affirm commitment to make a difference not only you, but there will be many partners involved.

So, when we go to the next circle the engagement circle in the engagement circle helps us in identify various partners. So, this commit in the first phases affirm commitment to make a difference from all those partners that you have identify. Then establish management structure very important, otherwise a project at that skill is not possible to manage. Then you choose framing considerations.

What does that mean? It is like you have to select the general issues, you have to select general objectives, you have to select spatial and temporal frame for consideration. So, what is the space in which you will be doing your intervention and the kind of time frames that you are targeting. So, within say next 10 years I want to achieve goal x, can be one of the ways of saying it. The last phase of commit is you assign the resources for required resources for the project.

Then comes engage, where you consult key constraint groups and individuals which you can identify using the engagement circles. Then you entrust collaborators and form a critical reference group, then you empower local communities for which you can do you see critical community feedback.

At this particular phase, you can also use the frog's collective action tool cage which we had discussed in when we were trying to discuss about the MSDS methodology. You can also the next phase is accord recognition to partners, then comes the stage assess; where you determine the knowledge and resources.

So, you determine local knowledge, you determine strengths and weaknesses, you determine the contested social themes. All the social themes were in there is some kind of contentment. So, in order to do the first that is determine local knowledge, you can use the knowledge profile process. To determine the contested social themes, you can use the social themes process available on this particular website. Then next step is analyze the data and documents to do that you first analyze existing public data.

So, data which is available publicly, then you analyze existing policy documents and research, then you analyze the existing indicators. Then next step is research social

context; where you do research with community responses for which you will use the social life questionnaire tool. Then you do the research on urban context for by using the urban profile process.

Then you do research and individual responses by using that strategic interviews tool. The last phase of assess is project outcomes where you say project future scenarios. So, this is like scenario projection process tool, project program scenarios, where you use the intelligent cities simulator tool.

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STAGE	PHASE	ACTION	TOOL
DEFINE	Clarify definitions, forces and risks	Clarify general issue and objective(s)	General Issue' Clarification Process
		Clarify materiality considerations	
		Clarify driving forces and risks	
	Identify critical issues and indicators	Identify critical issues and objectives	
		Resolve tensions between objectives	
		Identify core indicators; choose targets	Critical Issue' Identification Process
	Refine project parameters		
	Review project plans		
IMPLEMENT	Authorize the plan		
	Enable project support		
	Liaise with constitutents		
	Revise the plan periodically		

The next stage in this process is defined where you clarify definitions forces and risks. So, clarify general issues and objectives, clarify materiality considerations, clarify driving forces and risks by using the general issues clarification process tool. Next you identify critical issues and indicators, you identify critical issues and objectives resolve tensions between objectives identity core indicators chose targets by using the critical issue identification process tool.

Then you refine the project parameters, because now you have good clarity regarding all definitions forces risks critical issues and indicator. So, you can refine your project parameters and you can also review your project plan. Once that phases done, then you get into the implementation phase where you authorize the plan enable project support, realize with constituents revise the plan periodically.

| STAGE	PHASE	ACTION	TOOL
MEASURE	Monitor indicators		
	Document project implementation		
	Reassess profiles and processes	Reassess Social Life Questionnaire, and evaluate changes Reassess Urban Profile and evaluate changes Reassess Social Themes Profile and evaluate changes Reassess Knowledge Profile and evaluate changes Reassess Strengths and Weakness Profile, evaluate changes Reassess Social Themes Process and evaluate changes Reassess Scenarios Planning Process and evaluate changes Reassess Intelligent Cities Simulator and evaluate changes	
	Evaluate project		
COMMUNICATE	Translate themes and learning		
	Publicize the process and outcomes of the project		
	Report to all constituents and relevant agencies		
	Advise communities and all levels of government		

Very important stage measure and communicate, so, after you have done the implementation phase, you have to the measure. So, where you have to monitor the indicators, document project implementation and reassess profiles and processes. You again take up the profile circle and you can do a reassessment. So, reassess social life questionnaire and evaluate changes, reassess urban profile and evaluate changes, reassess social themes profile and evaluate changes. So, all the tasks that you had done in the first few pages to get the clarity and definition you do a reassessment on all of them to see and evaluate the changes.

Then comes your final evaluate the project. Then you need to communicate so, you have to translate themes and learning publicize the process and outcomes of the process, report to all constituents and relevant agencies, advice communities and all levels of government on the basis of your learnings and project outcome measurements.

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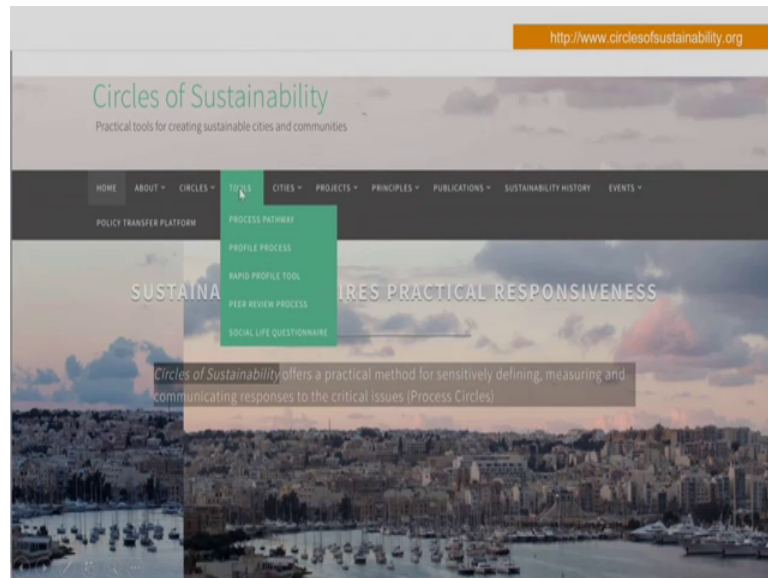
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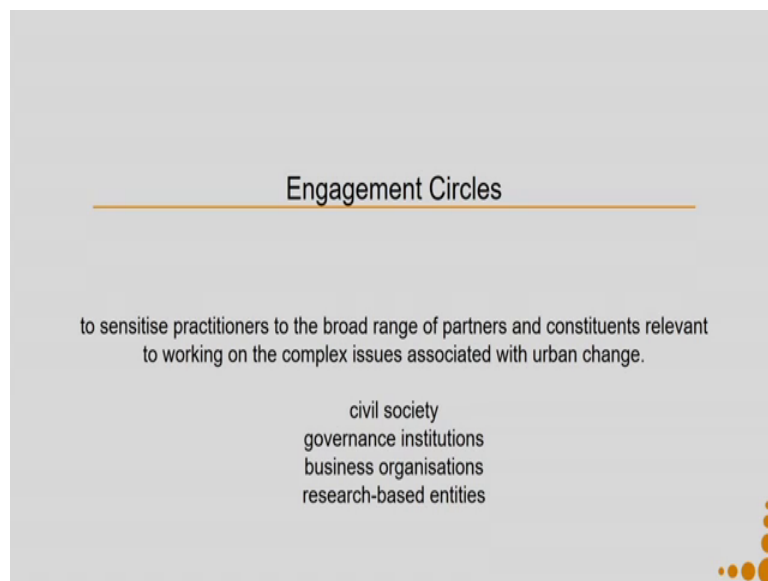
So, as we discussed here you will find all the tools which we need for doing this process circles phase. Next comes the third circle which is the engagement circle. It is to sensitize practitioners to the broad range of partners and constituents relevant to working on the complex issues associated with urban change. So, let us see how it looks like, it consists of civil society, governance institutions, business organizations and research based entities.

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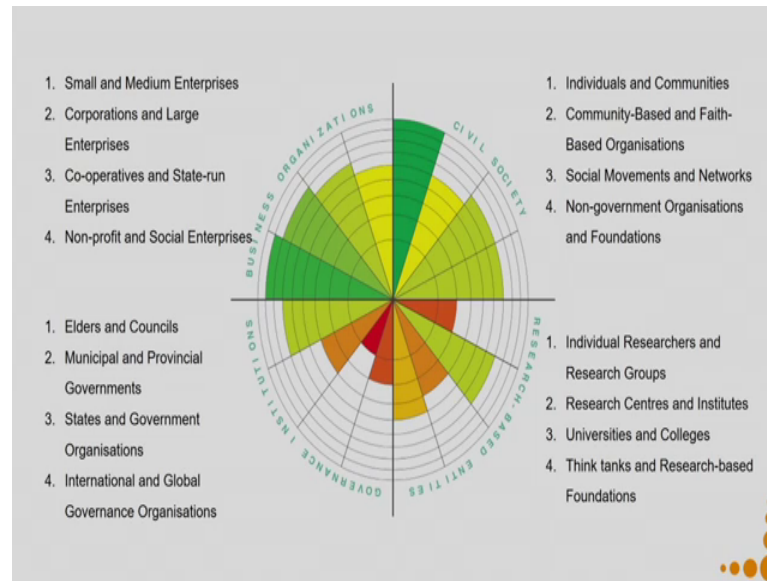
So, again a similar kind of visual representation can be used; which consists of civil society research based entities, governance institutions and business organizations. So, in civil societies we can have individuals and communities. We can have community based and faith based organizations, social movements and networks, non-government organizations and foundations.

So, when you use this engagement circle so, you can pick up each one of them and try to see how can you involve them in the most vibrant manner or what is their current contribution where are they currently located. In the research based entities, the 1st one is individual researchers and research groups, research centers and institutions, because they have an organizational structure to it. They might have more infrastructure, then universities and colleges very important because they are also research based entities.

Then you have think tanks and research based foundations. Not necessarily you will have each one of them available for a given situation, but how you can involve as many of them as possible to get a full picture. Then comes governance institutions, these can be elders and councils. So, in many regions it is the elders of a particular area who are considered to be the most important decision makers.
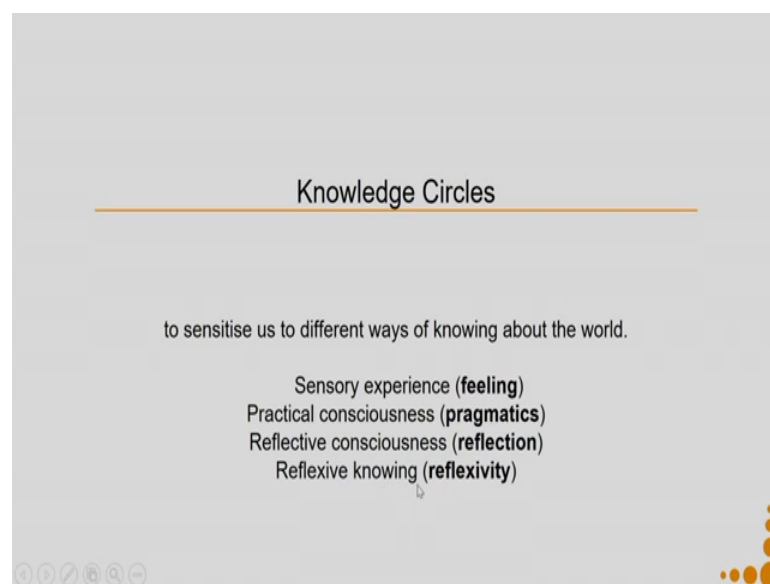
So, they might have a huge influence, in many social setups it is also the elders who have a lot of governing power. So, if say for example, in the family so, governance institution does not necessarily imply things related to government. Say, anything which is meant

for governance, municipal and provincial governments, state and government organizations, and international and global governance organizations, then comes our business organization.

So, we have to include small and medium enterprises, corporations and large enterprises, cooperatives and state run enterprises, nonprofit and social enterprises. What is a social enterprise? So, normal enterprise a normal company it is which is for profit company they are major aim of setting up the company is to make profit. A social enterprise is an enterprise whose aim main aim is to bring in social development.

They are not necessarily meant for profit, but something which is not meant for profit or say nonprofit does not necessarily mean that they will go into losses. They have to somehow make the revenue through certain sources, otherwise they cannot sustain their activities. So, social enterprise or not nonprofit does not imply that they are going to give away things for free, or they are not going to make money, it does not mean that. It what it means is their main motive of the enterprise is not to make profit, it is to do social development, but they have to on the revenues in order to keep their process running.

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Knowledge Circles

to sensitise us to different ways of knowing about the world.

Sensory experience (**feeling**)
Practical consciousness (**pragmatics**)
Reflective consciousness (**reflection**)
Reflexive knowing (**reflexivity**)

Then finally, we come to our 4th circle; which is called as the knowledge circle. It is a very important circle, but maybe if you are in at a bachelors educational level at this movement and may be for some of you even at masters level, it might be little difficult to understand all the domains of these knowledge circles because, it is little bit more

complicated. But they are certain levels which are more easier to understand. So, the knowledge circles it is meant to sensitize us to different ways of knowing about the way world. This can happen by so how can you know about the world? The first way is the sensory experience it is called as feeling.

Then is practical consciousness of pragmatics, 3rd is reflective consciousness; it is when you reflect upon something. And the 4th one which is very difficult to understand maybe at this particular state is called as the reflexive knowing or reflexivity.

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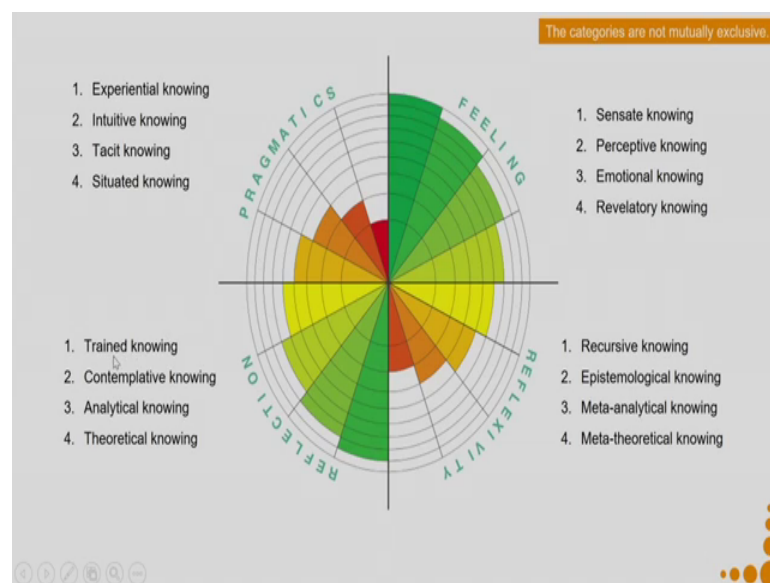
So, in the context of knowledge circles, we again depict it using similar kind of a graphical representation consisting of feeling, pragmatics, reflection and reflexivity. So, before going into the details of each of these, we will take a quick snap snapshot of what do they mean. So, feeling consists of sensate knowing, that is knowing through your sense organs, perceptive knowing, emotional knowing and revelatory knowing. Pragmatics consists of experiential knowing, intuitive knowing, tacit knowing and situated knowing.

Reflection consists of trained knowing, contemplative knowing, analytical knowing and theoretical knowing. Reflexivity consists of recursive knowing, epistemological knowing, meta analytical knowing and meta theoretical knowing. One very important thing to keep in mind in this particular knowledge circles is that these categories are not

mutually exclusive. Many a times it might be, you might be a little confused like this can come under this aspects as well as this aspects.

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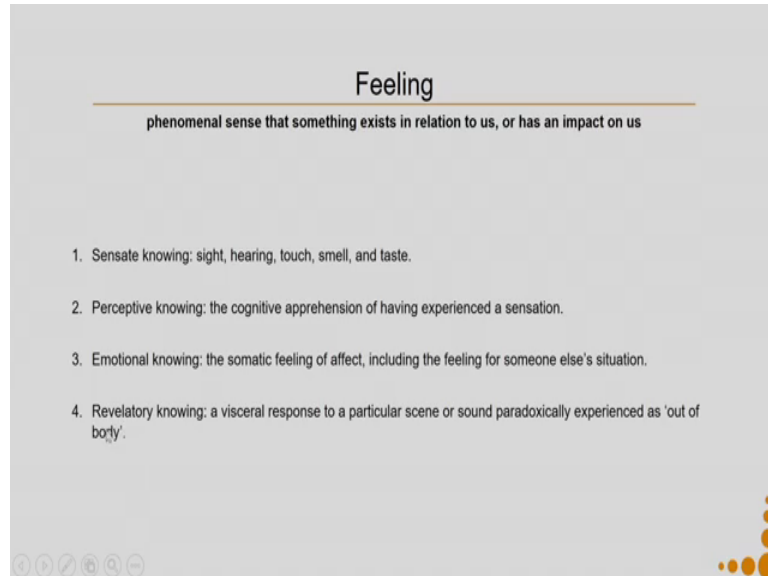
So, let us see in detail what each of these mean. When I am talking about feeling, that is the first level, we are talking about phenomenal sense that something exists in relation to us or has an impact on us. So, when I am talking about sensate knowing, it is like knowing through your sense organs we have 5 sense organs sight hearing touch smell and taste. So, when you know through by seeing something, by hearing something, by touching something, by smelling something and by testing something, it is about sensate knowing and it comes under the category of feeling.

Next one is perceptive knowing, the cognitive apprehension of having experienced a sensation. Say for example, you are in a particular location in the open area, you find a beautiful smell. First you find the smell, then you have to go through certain cognitive process to know that it is a beautiful smell or it is a foul smell, which we have leant that this one is a beautiful smell this is a foul smell.

Once you know that this is a beautiful smell, then you are cognitive process is we will try to identify where this beautiful smell might be coming from. So, if you are in say in a playground or in a garden, you will assume that it is coming from some flowers, if you do not recognize the flower you will still thing it is coming from some flower.

But, say if you are in a stadium, you might assume that this beautiful smell is coming because of perfume. So, it was the same sensation the sensation related to smell which went through certain cognitive processes and built in other information like surroundings season and so on and meant cognition of it so, that is known as perspective knowing.

Then you have emotional knowing: the somatic feeling of affect including the feeling for someone else is situation. So, anything which is to deal with emotions which might be evoke because of your activities of because of someone else. Say for example, you feel proud because your city won the most sustainable city award. It is because the whole city achieved it together, you so, that is kind of an emotional knowing way you might also feel proud, because you are the one who envision that.

So, the emotional knowing can come because of your situation or someone else is situation and it is a very important aspect for bringing in sustainability. The last one in this category is revelatory knowing. A visceral response to a particular scene or sound paradoxically experienced as out of the body.

Say for example, you go into a very calm and quiet place and at that particular location you have certain feelings because of the calmness and quietness of that place, that feeling might be different for you and for different for another person and you might have some kind you might feel that this is an out of body experience. So, that is about our revelatory knowing. You go to a calm and quiet garden, you might have a different revelatory knowing you go to a calm and quite building, you will have a altogether different revelatory knowing.

So, why feelings is very important in this particular context of circles of sustainability, and especially social sustainability? Because, feelings create through feelings you know something and that creates meanings for you, social meanings for you. And when we can have sustainable social meanings, we can bring in sustainability across all the 4 dimensions of the that we discussed in the profile circles. Say for example, if I have a very good feeling about the gardens about the fresh air even my city, I would the chances that I would like to protect that fresh air those gardens from any source of pollution, any source of damage is quite high, hence this particular domains importance.
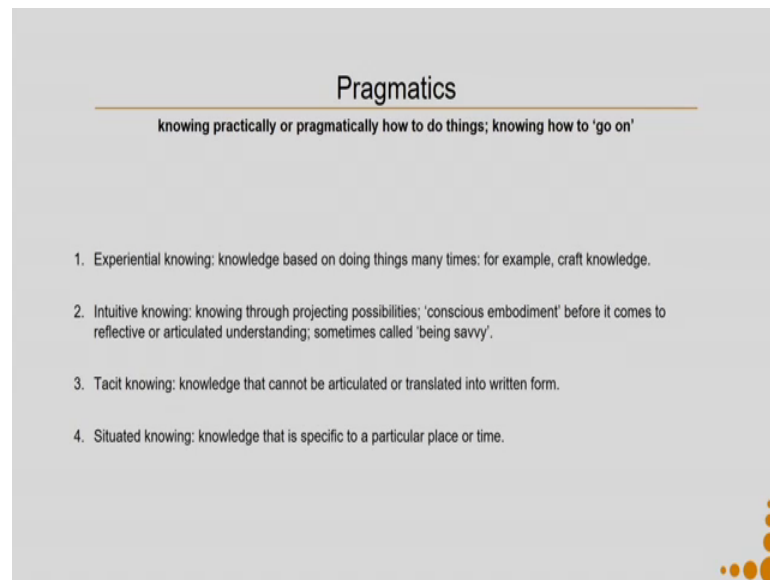
Let us go to the next knowledge circle, it is called as pragmatics. So, where you know because of practically or pragmatically how you do things or knowing how to go on. So, this is a knowledge which is gained through practical activities through your experience. Hence, the first one here is about experiential knowing, knowledge based on doing things many times.

So, say for example, if you do a particular craft many times you gain knowledge, you can practical practically how to do certain activities and that is because of experiential way of knowing. The this kind of knowledge is helpful in order to achieve sustainability. So, say for example, if you want people to do certain activities, if you want people to compose their own ways, people should be able to do that activity at home.

So, they should have the knowledge to do it and they should slowly get through experience get to become experts of doing it and then they can do it effectively. The next one is about intuitive knowing, knowing through projecting possibilities. Say for example, if you know how to operate a particular android phone from company x and you get another phone from company y, which is also android phone or say for example, it is a different kind of OS, it is a windows OS or it is an iOS, you will have some kind of intuitive knowing, because you know how to operate smart phones. So, you will be projecting possibilities ok.

So, there can be a back button, there will a possibilities of going back. So, how do I find out how to do that? So, in practical knowledge you in intuitive knowing it is very important. So, you have experience in certain other domains and because of those other domains you can project the possibilities of your knowledge and intuitively know how to do this new thing.

Say for example, if a large part of the community has some knowledge of farming, then introducing urban farming to that community is very much easier, because since they have some knowledge of farming from maybe their childhood, they intuitively learnt urban farming more easily much better and it might be more acceptable to them as well. Then there is tacit knowledge, knowledge that comes that cannot be articulated or translated into written form. Say for example, if you watch a cooking show, they will tell you add salt as per taste, why? They do not give you an exact quantity, exact amount a so many grams of salt to be added because, it is tacit knowledge.

It is a knowledge that cannot be articulated or translated into written form. So, there are many factors responsible say for example, there are different types of salt all together. So, your salt might be more salty then someone else is salt also everybody has different tastes for salt some people like less salt some people like more salt.

Also say for example, the kind of ingredients that you put in might also vary to certain extents which might also require changes in the quantity of salt added. Hence it is always said add salt as per your tastes so, this is kind of a tacit knowledge a knowledge with that cannot be articulated or trans in a translated into written form. But, it is gain because you did that activity so many times, you cooked so many times, that you know how much salt to put.

Situated knowing: so, knowledge that is specific to a particular place or time, Say for example, because, we deal with many different people. So, I know that with person a I have to deal in a certain manner, with person b I have to deal it with another manner. When I go to an organization I have to deal with them in a certain manner, to another organization I have to deal in different way so, this is called as situated knowing.

You again gained at because of your practical ways of how to do things how to make things happen and it is related to particular situation or a particular place or a particular time. This one is very important, because if you want to people to act sustainability to

behave sustainability, you need them to have certain kind of pragmatic knowledge. And you also need to influence that pragmatic knowledge.
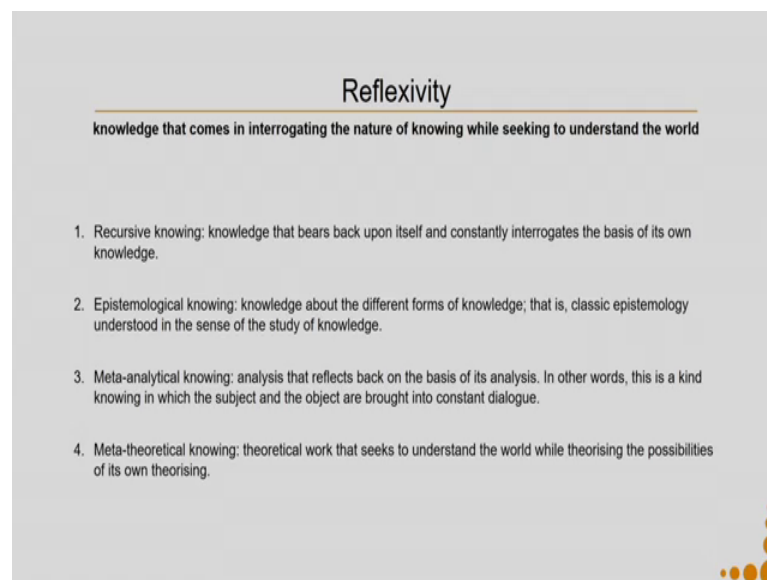
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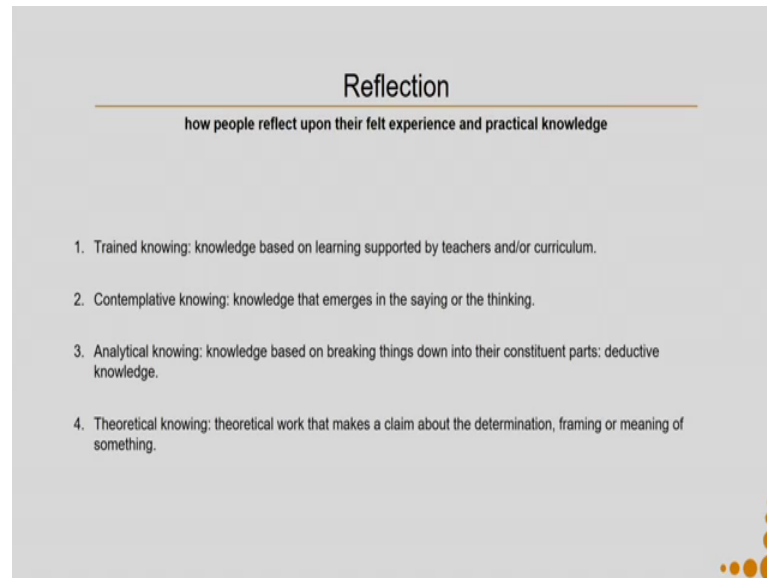
The 3rd one is about reflection, so, how people reflect upon their felt experience and practical knowledge. So, the previous two knowledge the feeling and the pragmatics, reflection is about how people reflect upon those two. So, the 1st one is trained knowing: knowledge based on learning supported by teachers and or curriculum. So, you might get felt experience as well as practical knowledge because teachers or certain curriculum thought you something so, this is trained knowledge and you reflect upon it. So, say for example, after you go through this course, you have learnt certain aspects of sustainability which I presented to you.

After that you will reflect on that course; when you are trying to answer the questions or when you are trying to apply it on your own project. Contemplative knowing: that is knowledge that emerges in the same or the thinking. So, it is simply like you are trying to say something; say for example, when I am talking about this particular course, I am discussing it with you at that very time while I am saying while I am thinking about it, I might I am also reflecting on what I am saying and what I am thinking so, that is about contemplative knowing. Analytical knowing: knowledge based on breaking things down in to their constituent parts, it is also called as deductive knowledge.

Say for example, if I do not know anything about camera and I want to learn about a camera. But, I know about certain aspects of it I know how battery works, I know how a memory card works. So, what I am doing over here is I am dividing the camera into it is constituent parts and those constituent I know about those constituent part. So, I know you have practical knowledge of a felt experience of those constituent parts.

And then I am doing and gathering analytical knowledge by breaking down (Refer Time: 58:26) into parts. The last one here is about theoretical knowing: so, theoretical work that makes a claim about the determination framing or meaning of something. So, when I present the theory in front you of you about sustainability, you have a theoretical knowing of it, then you will reflect upon it to apply it.

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The last dimension of the knowledge circle is reflexivity: so, the knowledge that comes in interrogating the nature of knowing while seeking to understand the world. So, it is the highest level of knowing and it comes when you are trying to know about the whatever you are trying to know about, when you are trying to understand a phenomenon, when you are trying to understand the world, that time you are asking this very question like, why this knowledge, how this knowledge, that time you are trying to do reflexivity.

So, recursive knowing: knowledge that bears back upon itself and constantly interrogates the basis of it is knowledge. So, say for example, I tell you memory and projection is a

very important for sustainability. When you are try to understand from where did this whole concept came, memory and recall is very important for sustainability.

What you are trying to do is recursive knowing, you are trying to know where the basics of this knowledge came, where did somebody come to know from that recognition, sorry, memory and projection is very important for sustainability. Next one is about epistemological knowing: so, knowledge about the different forms of knowledge that is classic epistemology understood in the sense of the study of knowledge.

If you are not able to follow this particular slide very much, do not worry, because this one is this topic is little beyond the level of bachelors and masters student, but if you are able to understand it then well and good. So, epistemological knowledge where you are trying to understand the different forms of knowledge so, like you saw in our particular example we talk spoke about sustainability from agriculture, from cities, from architecture, from product design perspective.

So, there are different forms of knowledge for the same domain called as sustainability. And when I try to compare all of them, what I am trying to do is knowledge about the different forms of knowledge. Then comes meta analytical knowing: analysis that reflects back on the basis of it is analysis. So, in other words this is a kind of knowing in which the subject and the object a brought into constant dialogue. So, analysis that reflects back on the basis of analysis so, I give you a tool for analysis and you try to identify on what basis that tool was formed. You are try to doing analysis back on the basis of the analysis.

Then comes meta theoretical knowing: so, theoretical work that seeks to understand the world while theorizing the possibilities of it is own theories. So, when you have a theory and you take that theory and try to understand how that theory has been theorized?

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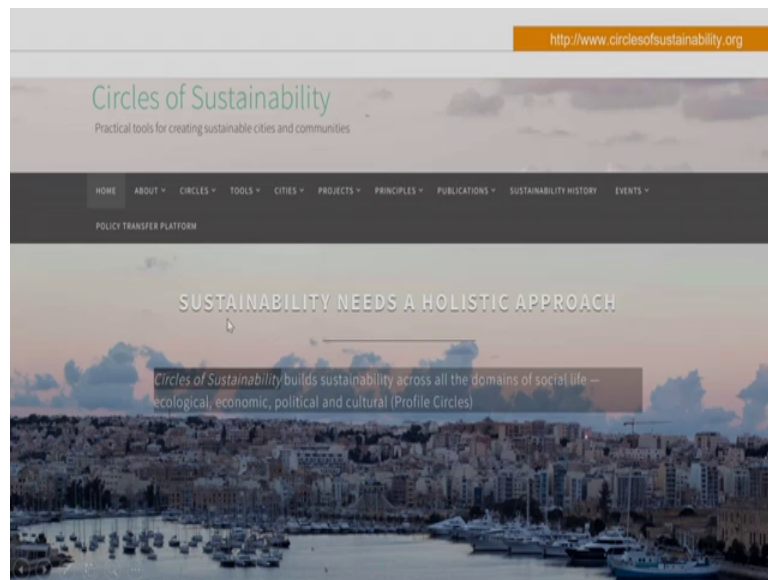
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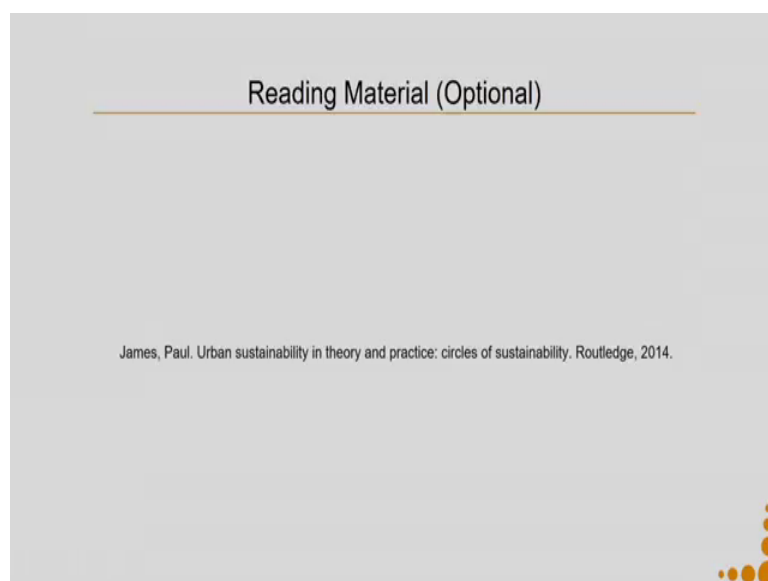
So, the reading material for this particular aspect is this website. You can also go through this book; this book has been written down by James Paul.

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In the next lecture, we will be talking about our last approach, for sustainability tools in the segment sustainability tools and approaches and it will be about carbon footprint. So, carbon footprint has been a very loosely used terminology, you might hear it in various ad campaigns and so on. But, in order to be able to apply it in any fruitful manner, we actually need to understand in depth what this carbon footprint is all about, how can we use it to bring in any difference.

Thank you.