Chapter 1 : Afterword â€" Cultures of Resilience

To support the raising of hygiene standards around the world, and contribute to reaching the UN Sustainable Development Goals, both the public and private sectors need to be engaged and collaborate.

Xeriscaping - garden and landscape design for water conservation Sustainable transport , incorporates five elements: Key areas of focus are soil, vegetation, hydrology, materials, and human health and well being. Increase of Cycling infrastructure would increase cycling within cities and reduce the amount of cars being driven and in turn reduce car emissions. This would also benefit the health of citizens as they would be able to get more exercise through cycling. Educating residents of cities about the positive impacts of living in a more sustainable city and why it is important would increase the initiative to have sustainable developments and push people to live in a more sustainable way. Architecture[edit] Buildings provide the infrastructure for a functioning city and allow for many opportunities to demonstrate a commitment to sustainability. A commitment to sustainable architecture encompasses all phases of building including the planning, building, and restructuring. Sustainable Site Initiatives is used by landscape architects, designers, engineers, architects, developers, policy-makers and others to align land development and management with innovative sustainable design. Eco-industrial park[edit] The purpose of an eco-industrial park is to connect a number of firms and organizations to work together to decrease their environmental impact while simultaneously improving their economic performance. The community of businesses accomplishes this goal through collaboration in managing environmental and resource issues, such as energy, water, and materials. The components for building an eco-industrial park include natural systems, more efficient use of energy, and more efficient material and water flows Industrial parks should be built to fit into their natural settings in order to reduce environmental impacts, which can be accomplished through plant design, landscaping, and choice of materials. For instance, there is an industrial park in Michigan built by Phoenix Designs that is made almost entirely from recycled materials. The landscaping of the building will include native trees, grasses, and flowers, and the landscaping design will also act as climate shelter for the facility. In choosing the materials for building an eco-industrial park, designers must consider the life-cycle analysis of each medium that goes into the building to assess their true impact on the environment and to ensure that they are using it from one plant to another, steam connections from firms to provide heating for homes in the area, and using renewable energy such as wind and solar power. In terms of material flows, the companies in an eco-industrial park may have common waste treatment facilities, a means for transporting by-products from one plant to another, or anchoring the park around resource recovery companies that are recruited to the location or started from scratch. To create more efficient water flows in industrial parks, the processed water from one plant can be reused by another plant and the parks infrastructure can include a way to collect and reuse storm water runoff. Urban Agriculture Urban farming is the process of growing and distributing food, as well as raising animals, in and around a city or in urban area. According to the RUAF Foundation, urban farming is different from rural agriculture because "it is integrated into the urban economic and ecological system: Such linkages include the use of urban residents as labourers, use of typical urban resources like organic waste as compost and urban wastewater for irrigation , direct links with urban consumers, direct impacts on urban ecology positive and negative , being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc. In order for urban farming to be a successful method of sustainable food growth, cities must allot a common area for community gardens or farms, as well as a common area for a farmers market in which the foodstuffs grown within the city can be sold to the residents of the urban system. Berms of fava beans have been planted at Hayes Valley Farm, a community-built farm on the former Central freeway ramps of San Francisco. Urban infill[edit] Many cities are currently in a shift from the suburban sprawl model of development to a return to urban dense living. This shift in geographic distribution of population leads to a denser core of city residents. These residents provide a growing demand

in many sectors that is reflected in the architectural fabric of the city. This new demand can be supplied by new construction or historic rehabilitation. Sustainable cities will opt for historical rehabilitation wherever possible. Having people live in higher densities not only gives economies of scale but also allows for infrastructure to be more efficient. Walkable urbanism[edit] Walkable urbanism is a development strategy in opposition to suburban sprawl. It advocates housing for a diverse population, a full mix of uses, walkable streets, positive public space , integrated civic and commercial centers, transit orientation and accessible open space. It also advocates for density and accessibility of commercial and government activity. New Urbanism[edit] The most clearly defined form of walkable urbanism is known as the Charter of New Urbanism. It is an approach for successfully reducing environmental impacts by altering the built environment to create and preserve smart cities which support sustainable transport. Residents in compact urban neighborhoods drive fewer miles, and have significantly lower environmental impacts across a range of measures, compared with those living in sprawling suburbs. The concept of circular flow land use management has also been introduced in Europe to promote sustainable land use patterns that strive for compact cities and a reduction of greenfield land taken by urban sprawl. In sustainable architecture the recent movement of New Classical Architecture promotes a sustainable approach towards construction, that appreciates and develops smart growth , walkability, architectural tradition and classical design. This in contrast to modernist and globally uniform architecture, as well as opposing solitary housing estates and suburban sprawl. Both trends started in the s. LEED recognizes whole building sustainable design by identifying key areas of excellence including: In order for a building to become LEED certified sustainability needs to be prioritized in design, construction, and use. One example of sustainable design would be including a certified wood like bamboo. Bamboo is fast growing and has an incredible replacement rate after being harvested. By far the most credits are rewarded for optimizing energy performance. This promotes innovative thinking about alternative forms of energy and encourages increased efficiency. The building principles of SSI are to design with nature and culture, use a decision-making hierarchy of preservation, conservation, and regeneration, use a system thinking approach, provide regenerative systems, support a living process, use a collaborative and ethical approach, maintain integrity in leadership and research, and finally foster environmental stewardship. All of these help promote solutions to common environmental issues such as greenhouse gases , urban climate issues, water pollution and waste, energy consumption , and health and wellbeing of site users. The main focus is hydrology, soils, vegetation, materials, and human health and well being. In SSI, the main goal for hydrology in sites is to protect and restore existing hydrologic functions. To design storm water features to be accessible to site users, and manage and clean water on site. For site design of soil and vegetation many steps can be done during the construction process to help minimize the urban heat island effects, to and minimize the building heating requirements by using plants. In order to reduce the environmental impact caused by transportation in metropolitan areas, sustainable transportation has three widely agreed upon pillars that it utilizes to create more healthy and productive urban centers. The Carbon Trust states that there are three main ways cities can innovate to make transport more sustainable without increasing journey times - better land use planning, modal shift to encourage people to choose more efficient forms of transport, and making existing transport modes more efficient. Car free city[edit] The concept of car free cities or a city with large pedestrian areas is often part of the design of a sustainable city. A large part of the carbon footprint of a city is generated by cars so the car free concept is often considered an integral part of the design of a sustainable city. Emphasis on proximity[edit] Created by eco friendly urban planning, the concept of urban proximity is an essential element of current and future sustainable transportation systems. This requires that cities be built and added onto with appropriate population and landmark density so that destinations are reached with reduced time in transit. This reduced time in transit allows for reduced fuel expenditure and also opens the door to alternative means of transportation such as bike riding and walking. Transportation in downtown Chicago Furthermore, close proximity of residents and major landmarks allows for the creation of efficient public transportation by eliminating long sprawled out routes and reducing commute time. This in turn decreases the social cost to

residents who choose to live in these cities by allowing them more time with families and friends instead by eliminating part of their commute time. Compact city and Pocket neighborhood Diversity in modes of transportation[edit] Sustainable transportation emphasizes the use of a diversity of fuel-efficient transportation vehicles in order to reduce greenhouse emissions and diversity fuel demand. Due to the increasingly expensive and volatile cost of energy, this strategy has become very important because it allows a way for city residents to be less susceptible to varying highs and lows in various energy prices. Among the different modes of transportation , the use alternative energy cars and widespread installation of refueling stations has gained increasing importance, while the creation of centralized bike and walking paths remains a staple of the sustainable transportation movement. Access to transportation[edit] In order to maintain the aspect of social responsibility inherent within the concept of sustainable cities, implementing sustainable transportation must include access to transportation by all levels of society. Due to the fact that car and fuel cost are often too expensive for lower income urban residents, completing this aspect often revolves around efficient and accessible public transportation. In order to make public transportation more accessible, the cost of rides must be affordable and stations must be located no more than walking distance in each part of the city. As studies have shown, this accessibility creates a great increase in social and productive opportunity for city residents. By allowing lower income residents cheap and available transportation, it allows for individuals to seek employment opportunities all over the urban center rather than simply the area in which they live. This in turn reduces unemployment and a number of associated social problems such as crime, drug use, and violence. Urban strategic planning[edit] Although there is not an international policy regarding sustainable cities and there are not established international standards, there is an organization, the United Cities and Local Governments UCLG that is working to establish universal urban strategic guidelines. The 60 members of the UCLG committee evaluate urban development strategies and debate theses experiences to make the best recommendations. Additionally, the UCLG accounts for differences in regional and national context. All the organizations are making a great effort to promote this concept by media and internet, and in conferences and workshops. Development[edit] Recently, local and national governments and regional bodies such as the European Union have recognized the need for a holistic understanding of urban planning. This is instrumental to establishing an international policy that focuses on cities challenges and the role of the local authorities responses. Generally, in terms of urban planning, the responsibility of local governments are limited to land use and infrastructure provision excluding inclusive urban development strategies. The advantages of urban strategic planning include an increase in governance and cooperation that aids local governments in establishing performance based-management, clearly identifying the challenges facing local community and more effectively responding on a local level rather than national level, and improves institutional responses and local decision making. Additionally, it increases dialogue between stakeholders and develops consensus-based solutions, establishing continuity between sustainability plans and change in local government; it places environmental issues as the priority for the sustainable development of cities and serves as a platform to develop concepts and new models of housing, energy and mobility. Obstacles[edit] The City Development Strategies CDS addresses new challenges and provides space for innovative policies that involves all stakeholders. The inequality in spatial development and socio-economic classes paired with concerns of poverty reduction and climate change are factors in achieving global sustainable cities. According to the UCLG there are differences between regional and national conditions, framework and practice that are overcome in the international commitment to communication and negotiation with other governments, communities and the private sector to continual to develop through innovative and participatory approaches in strategic decisions, building consensus and monitoring performance management and raising investment. The UCLG has specifically identified 13 global challenges to establishing sustainable cities:

Chapter 2 : Sustainability - Wikipedia

In this Afterword, the editors reflect on some of the main themes emerging from the collected chapters. They note that the UNESCO Global Monitoring Report, Education for People and Planet, was.

They do not pretend to be the conclusions on the overall project. They simply present some first observations on some common characters of the 13 working groups discussions. Ezio Manzini The CoR Project final goal has been to discuss how art and design contribute to weave people and place. That is, to re build communities-in-places and, doing so, to move some steps towards of a resilient sustainable society. These works had different motivation and goals. But they also had a common character: The experiment specificity has been to present and discuss the proposed initiatives moving from this specific common angle and raising this question: What is the relationship between these interaction and art and design initiative that made them possible? Here some common or quasi-common characters: The encounters proposed are mainly the result of light-short interactions. They range from art performance, to pop-up events, to punctual interventions in longer, or even open-ended, design processes. In fact, an encounter with someone who appears to be very diverse requires taking a risk: They require enabling places. These safe places must be, at the same time, open, protected and, if possible, endowed with a kind of un-finished character. They require triggering artefacts. Tangible mediating objects or practical collaborative capable to offer the involved actors an opportunity to start a conversation and to experiment new kinds of interactions. The encounters per se cannot be designed. In turn, enabling places and triggering artefacts must be attentively conceived and developed. Discussing these characters, it must be also considered that this Seminar discussed the results of experiments done by students and teachers in an art and design school. This implied that the proposed encounters majority had students as one of the main actors. In turn, these encounters between students and other residents actors are very specific: At the same time, this kind of encounters seems to be highly emblematic: That is, these people are transient in relation with the others. In conclusion, the new communities-in-place must be able to include, in the variety of interactions they offer, also this kind of encounters. Students and teachers, as well as migrants, tourists, and other people-on-the-move, should be included, and play a positive role, in the community-in-place where it happens them to stop for a while.

Chapter 3 : Systems of Cities: Harnessing Urbanization for Growth and Poverty Alleviation

Taken together, global philanthropy has enormous unrealized potential for promoting fresh thinking, new approaches, and sustainable solutions to some of the world?s toughest problems, beyond the inflexibility of government or the narrower interests of business.

Comprehensive development in this way will improve quality of life, create employment and enhance incomes for all, especially for poor and the disadvantaged people, transforming smart cities to inclusive cities. Let us understand this using some examples. The Edge, in Amsterdam, is not only the greenest office building in the world but also the most connected one. It is a living lab for innovative applications of the Internet Of Things in office environments. The building has a floor space of The majority of these are integrated into a revolutionary new lighting system consisting of 6. Each luminaire has its unique IP-address and is equipped with sensors for infrared, ambient light, temperature and humidity. Smart apps can be used to define personal preferences for temperature and lighting. When the sensors detect a user, the lighting and cooling at that spot is automatically adjusted. During the day the sensors detect the intensity with which each part of the building is used. At the end of the day, this data is visualized in a heat map used by the cleaning staff to focus on areas that have been used most. Next, to the thousands of sensors in the smart ceiling, sensors are used in all kind of objects, such as coffee machines and towel dispensers. The data that is generated by these objects is used by facility services to refill just in time. All smart solutions contribute to energy efficiency, security, and convenience. In order to become a smart destination, the Foundation Visit Benidorm has incorporated a new network of beacons throughout the city. In this way, depending on the tourist location and profile age, gender, visited places, country, language, etc , information about culture, nature, beaches, history, sports, events and leisure are displayed. As many travelers arrive in cities without internet connection, the experiences are delivered offline using beacons as triggers. This way, tourists simply need to activate Bluetooth to be able to receive the information. As an important traffic junction, Zutphen is also working on making the city even more beautiful and smart. Until July there will be, among other things, extensive work on the infrastructure maintenance of IJsselkade and the Oude IJsselbrug. This work has consequences for the accessibility of the city, so in order to improve the quality of life of its citizens, the location-aware app informs people about current traffic. For instance, a citizen that is driving in the proximity of the working area is alerted via mobile app to take an alternative route. Also, you get a picture of the parking locations at a glance and it gives you the latest news about the IJsselkade, the Oude IJssel bridge and other projects of River in the City. It provides citizens and tourists a new way to experience the city, making it smarter and interactive. In addition to its commercial, academic and non-profit applications, the beacon network offers a public safety feature, especially for users along the Chattahoochee Riverwalk. As a part of its Safe City program, a total of 37 beacons have been mounted along the Riverwalk to make it easy for city police to zero-down on the location of any user who happens to call from the remote areas of Riverwalk. Users who have downloaded the app will receive the nearest beacon number which in turn allow them to report suspicious or non-emergency activity by dialing from the app itself. Are there any other interesting smart city project using IoT technology that we missed out on? Let us know in the comments below.

Chapter 4 : Sustainable city - Wikipedia

At the same time, this kind of encounters seems to be highly emblematic: in a fluid world, the encounter between transient and abiding actors is a very diffuse (in a fluid world, for different reasons, a growing number of people is on-the-move.

Yet, the contribution of heritage to a sustainable human development is major. Certainly, the protection of exceptional heritage properties cherished by people all over the world â€" such as great natural sceneries and landmark monuments - can be considered as an intrinsic contribution to human wellbeing. It would be hard to imagine our countries, cities and landscapes without the familiar remnants of our past, a witness to continuity through the passing of time, and the presence of nature, to inspire us with a profound sense of wonder and joy. But in addition to its intrinsic value for present and future generations, World Heritage â€" and heritage in general â€" can make also an important instrumental contribution to sustainable development across its various dimensions. Through a variety of goods and services and as a storehouse of knowledge, a well-protected World Heritage property may contribute directly to alleviating poverty and inequalities by providing basic goods and services, such as security and health, through shelter, access to clean air, water, food and other key resources. Preserving natural resources, including outstanding sites containing some of the richest combinations of terrestrial and marine biodiversity, is obviously a fundamental contribution to environmental sustainability. Most of these sites, on the other hand, have developed over time through mutual adaptation between humans and the environment, and thus demonstrate how, rather than existing in separate and parallel realms, biological and cultural diversities interact with and affect one another in complex ways in a sort of co-evolutionary process. Very often, World Heritage is also an important asset for economic development, by attracting investments and ensuring green, locally-based, stable and decent jobs, only some of which may be related to tourism. Activities associated to the stewardship of cultural and natural heritage, indeed, are local by definition i. This is true for natural protected areas rich in biodiversity, of course, but also for cultural landscapes and historic cities. World Heritage, of course, is also essential to the spiritual wellbeing of people for its powerful symbolic and aesthetic dimensions. The acknowledgment and conservation of the diversity of the cultural and natural heritage, fair access to it and the equitable sharing of the benefits deriving from its use, enhance the feeling of place and belonging, mutual respect for others and a sense of purpose and ability to maintain a common good, which contribute to the social cohesion of a community as well as to individual and collective freedom of choice and action. A well-maintained heritage is also very important in addressing risks related to natural and human-made disasters. Experience has shown how the degradation of natural resources, neglected rural areas, urban sprawl and poorly engineered new constructions increase the vulnerability of communities to disaster risks, especially in poorer countries. At times of crisis, moreover, access to and care for the heritage may help vulnerable people recover a sense of continuity, dignity and empowerment. All of the above concerned potential positive contributions that an appropriate WH conservation and management could make to sustainable development. In these articles, moreover, the scope of action of the Convention seems to go beyond the sites included in its List of World Heritage properties, to encompass national heritage policies and wider development strategies. At its 35th Session Paris, , the World Heritage Committee made a number of additions to the Operational Guidelines which refer to sustainable development, notably in paragraphs , , , as well as in Annex 5, points 4. Various paragraphs of the Operational Guidelines, moreover, call for a full participatory approach in the identification, protection and management of World Heritage properties e. In this context, World Heritage sites could provide the testing ground where innovative approaches could be applied. The Need for a Policy Despite these advances, contributing to sustainable development is not an explicit policy in the framework of the implementation of the Convention, as this continues to focus primarily on protecting Outstanding Universal Value OUV , which justifies the inscription of properties on the World Heritage List. The current procedures and guidelines for the

implementation of the World Heritage Convention, indeed, do not currently include specific recommendations, checks and controls that would enable governments to fully harness the potential of World Heritage for sustainable development, on one hand, and to ensure that their heritage conservation and management policies and programmes are aligned with broader sustainable development goals, on the other hand. This means that many opportunities could be missed in the implementation of the Convention simply because those responsible may not consider them or may not know how to translate them in concrete sustainable development gains. Conversely, the current procedures of the Convention offer no clear means to encourage heritage conservation and management to better align its activities with important sustainable development objectives, such as the respect of human rights, addressing basic needs of local communities or non-depletion of natural resources. For all these reasons, at its 36th Session Saint Petersburg, , the World Heritage Committee considered that the integration of sustainable development into the processes of the Convention should be promoted through a specific policy. Policy to integrate a sustainable development perspective within the processes of the World Heritage Convention To make a real impact on nearly a thousand sites around the world, the outcomes of expert meetings and other consultations on World Heritage and sustainable development need to be translated into actual policy for the implementation of the Convention. Recognizing this, at its 36th session St. On 19 November , the 20th General Assembly of the States Parties to the World Heritage Convention adopted a Policy on the integration of a sustainable development perspective into the processes of the Convention. The overall goal of the policy is to assist States Parties, practitioners, institutions, communities and networks, through appropriate guidance, to harness the potential of World Heritage properties and heritage in general, to contribute to sustainable development and therefore increase the effectiveness and relevance of the Convention whilst respecting its primary purpose and mandate of protecting the Outstanding Universal value of World Heritage properties. Its adoption represents a significant shift in the implementation of the Convention and an important step in its history. Following the adoption of the policy, relevant changes will have to be introduced within theOperational Guidelines for the Implementation of the World Heritage Convention, so as to translate its principles into actual procedures. The concrete implementation of the policy will no doubt require the building of necessary capacities among practitioners, institutions, concerned communities and networks, across a wide interdisciplinary and inter-sectorial spectrum. The necessary tools and programmes will therefore have to be developed, and appropriate indicators defined, to monitor progress in the implementation of the policy. Ongoing consultation with States Parties and other relevant stakeholders will be also established with a view to enriching the policy in the future.

Chapter 5 : LEED Platinum Hotel - Proximity Hotel in Greensboro, NC

There are no countries in the world that achieve a true steady-state economy (i.e. stable stocks and flows at a level of resource use that is environmentally sustainable). However, a small number of countries come relatively close, including Colombia, Cuba, Kyrgyzstan, Romania, and South Africa.

Increased Production Costs A growing movement has emerged during the past two decades to question the role of the agricultural establishment in promoting practices that contribute to these social problems. Today this movement for sustainable agriculture is garnering increasing support and acceptance within mainstream agriculture. Not only does sustainable agriculture address many environmental and social concerns, but it offers innovative and economically viable opportunities for growers, laborers, consumers, policymakers and many others in the entire food system. This page is an effort to identify the ideas, practices and policies that constitute our concept of sustainable agriculture. We do so for two reasons: Because the concept of sustainable agriculture is still evolving, we intend this page not as a definitive or final statement, but as an invitation to continue the dialogue. What is Sustainable Agriculture? A variety of philosophies, policies and practices have contributed to these goals. People in many different capacities, from farmers to consumers, have shared this vision and contributed to it. Despite the diversity of people and perspectives, the following themes commonly weave through definitions of sustainable agriculture: Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. Therefore, stewardship of both natural and human resources is of prime importance. Stewardship of human resources includes consideration of social responsibilities such as working and living conditions of laborers, the needs of rural communities, and consumer health and safety both in the present and the future. Stewardship of land and natural resources involves maintaining or enhancing this vital resource base for the long term. A systems perspective is essential to understanding sustainability. The system is envisioned in its broadest sense, from the individual farm, to the local ecosystem, and to communities affected by this farming system both locally and globally. An emphasis on the system allows a larger and more thorough view of the consequences of farming practices on both human communities and the environment. A systems approach gives us the tools to explore the interconnections between farming and other aspects of our environment. Everyone plays a role in creating a sustainable food system. A systems approach also implies interdisciplinary efforts in research and education. This requires not only the input of researchers from various disciplines, but also farmers, farmworkers, consumers, policymakers and others. Making the transition to sustainable agriculture is a process. For farmers, the transition to sustainable agriculture normally requires a series of small , realistic steps. Family economics and personal goals influence how fast or how far participants can go in the transition. It is important to realize that each small decision can make a difference and contribute to advancing the entire system further on the "sustainable agriculture continuum. Finally, it is important to point out that reaching toward the goal of sustainable agriculture is the responsibility of all participants in the system, including farmers, laborers, policymakers, researchers, retailers, and consumers. Each group has its own part to play, its own unique contribution to make to strengthen the sustainable agriculture community. The remainder of this page considers specific strategies for realizing these broad themes or goals. The strategies are grouped according to three separate though related areas of concern: They represent a range of potential ideas for individuals committed to interpreting the vision of sustainable agriculture within their own circumstances. Farming and Natural Resources Back to top. When the production of food and fiber degrades the natural resource base, the ability of future generations to produce and flourish decreases. The decline of ancient civilizations in Mesopotamia, the Mediterranean region, Pre-Columbian southwest U. Water Water is the principal resource that has helped agriculture and society to prosper, and it has been a major limiting factor when mismanaged. Water supply and use. In California, an extensive water storage and transfer system has been established which has allowed crop production to expand to very arid regions. In drought years, limited

surface water supplies have prompted overdraft of groundwater and consequent intrusion of salt water, or permanent collapse of aquifers. Periodic droughts, some lasting up to 50 years, have occurred in California. Several steps should be taken to develop drought-resistant farming systems even in "normal" years, including both policy and management actions: The most important issues related to water quality involve salinization and contamination of ground and surface waters by pesticides, nitrates and selenium. Tile drainage can remove the water and salts, but the disposal of the salts and other contaminants may negatively affect the environment depending upon where they are deposited. Temporary solutions include the use of salt-tolerant crops , low-volume irrigation, and various management techniques to minimize the effects of salts on crops. In the long-term, some farmland may need to be removed from production or converted to other uses. Other uses include conversion of row crop land to production of drought-tolerant forages, the restoration of wildlife habitat or the use of agroforestry to minimize the impacts of salinity and high water tables. Another way in which agriculture affects water resources is through the destruction of riparian habitats within watersheds. The conversion of wild habitat to agricultural land reduces fish and wildlife through erosion and sedimentation, the effects of pesticides, removal of riparian plants, and the diversion of water. The plant diversity in and around both riparian and agricultural areas should be maintained in order to support a diversity of wildlife. This diversity will enhance natural ecosystems and could aid in agricultural pest management. Energy Modern agriculture is heavily dependent on non-renewable energy sources, especially petroleum. The continued use of these energy sources cannot be sustained indefinitely, yet to abruptly abandon our reliance on them would be economically catastrophic. However, a sudden cutoff in energy supply would be equally disruptive. In sustainable agricultural systems, there is reduced reliance on non-renewable energy sources and a substitution of renewable sources or labor to the extent that is economically feasible. Air Many agricultural activities affect air quality. These include smoke from agricultural burning; dust from tillage, traffic and harvest; pesticide drift from spraying; and nitrous oxide emissions from the use of nitrogen fertilizer. Options to improve air quality include: Soil Soil erosion continues to be a serious threat to our continued ability to produce adequate food. Numerous practices have been developed to keep soil in place, which include: Enhancement of soil quality is discussed in the next section. Sustainable production practices involve a variety of approaches. Despite the site-specific and individual nature of sustainable agriculture, several general principles can be applied to help growers select appropriate management practices: Selection of site, species and variety Preventive strategies, adopted early, can reduce inputs and help establish a sustainable production system. When possible, pest-resistant crops should be selected which are tolerant of existing soil or site conditions. When site selection is an option, factors such as soil type and depth, previous crop history, and location e. Diversity Diversified farms are usually more economically and ecologically resilient. By growing a variety of crops, farmers spread economic risk and are less susceptible to the radical price fluctuations associated with changes in supply and demand. Properly managed, diversity can also buffer a farm in a biological sense. For example, in annual cropping systems, crop rotation can be used to suppress weeds, pathogens and insect pests. Also, cover crops can have stabilizing effects on the agroecosystem by holding soil and nutrients in place, conserving soil moisture with mowed or standing dead mulches, and by increasing the water infiltration rate and soil water holding capacity. Cover crops in orchards and vineyards can buffer the system against pest infestations by increasing beneficial arthropod populations and can therefore reduce the need for chemical inputs. Using a variety of cover crops is also important in order to protect against the failure of a particular species to grow and to attract and sustain a wide range of beneficial arthropods. Optimum diversity may be obtained by integrating both crops and livestock in the same farming operation. This was the common practice for centuries until the mids when technology, government policy and economics compelled farms to become more specialized. Mixed crop and livestock operations have several advantages. First, growing row crops only on more level land and pasture or forages on steeper slopes will reduce soil erosion. Second, pasture and forage crops in rotation enhance soil quality and reduce erosion; livestock manure, in turn, contributes to soil fertility. Third, livestock can buffer the negative impacts of low rainfall periods by consuming crop residue

that in "plant only" systems would have been considered crop failures. Finally, feeding and marketing are flexible in animal production systems. This can help cushion farmers against trade and price fluctuations and, in conjunction with cropping operations, make more efficient use of farm labor. Soil management A common philosophy among sustainable agriculture practitioners is that a "healthy" soil is a key component of sustainability; that is, a healthy soil will produce healthy crop plants that have optimum vigor and are less susceptible to pests. While many crops have key pests that attack even the healthiest of plants, proper soil, water and nutrient management can help prevent some pest problems brought on by crop stress or nutrient imbalance. In sustainable systems, the soil is viewed as a fragile and living medium that must be protected and nurtured to ensure its long-term productivity and stability. Methods to protect and enhance the productivity of the soil include: Regular additions of organic matter or the use of cover crops can increase soil aggregate stability, soil tilth, and diversity of soil microbial life. Efficient use of inputs Many inputs and practices used by conventional farmers are also used in sustainable agriculture. Sustainable farmers, however, maximize reliance on natural, renewable, and on-farm inputs. Equally important are the environmental, social, and economic impacts of a particular strategy. Converting to sustainable practices does not mean simple input substitution. Frequently, it substitutes enhanced management and scientific knowledge for conventional inputs, especially chemical inputs that harm the environment on farms and in rural communities. The goal is to develop efficient, biological systems which do not need high levels of material inputs. Growers frequently ask if synthetic chemicals are appropriate in a sustainable farming system. Sustainable approaches are those that are the least toxic and least energy intensive, and yet maintain productivity and profitability. Preventive strategies and other alternatives should be employed before using chemical inputs from any source. However, there may be situations where the use of synthetic chemicals would be more "sustainable" than a strictly nonchemical approach or an approach using toxic "organic" chemicals. For example, one grape grower switched from tillage to a few applications of a broad spectrum contact herbicide in the vine row. This approach may use less energy and may compact the soil less than numerous passes with a cultivator or mower. Consideration of farmer goals and lifestyle choices Management decisions should reflect not only environmental and broad social considerations, but also individual goals and lifestyle choices. Management decisions that promote sustainability, nourish the environment, the community and the individual. Animal Production Practices Back to top. In the early part of this century, most farms integrated both crop and livestock operations.

Chapter 6 : AFTERWORD TO THE 5TH INTERNATIONAL SYMPOSIUM ON SOIL ORGANIC MATTER! -

Afterword. Although the story of the Salton Sea is one of a difficult struggle to wrestle the land into compliance with human agendas, it also reveals how wildlife can benefit from human interventions in the environment.

Sustainable development The name sustainability is derived from the Latin sustinere tenere, to hold; sub, under. Sustain can mean "maintain", "support", or "endure". Components[edit] Three dimensions of sustainability[edit] A diagram indicating the relationship between the "three pillars of sustainability", in which both economy and society are constrained by environmental limits [18] Venn diagram of sustainable development: One such pillar is future generations, which emphasizes the long-term thinking associated with sustainability. A study from pointed out that environmental justice is as important as sustainable development. The simple definition that sustainability is something that improves "the quality of human life while living within the carrying capacity of supporting eco-systems", [34] though vague, conveys the idea of sustainability having quantifiable limits. But sustainability is also a call to action, a task in progress or "journey" and therefore a political process, so some definitions set out common goals and values. More than that, sustainability implies responsible and proactive decision-making and innovation that minimizes negative impact and maintains balance between ecological resilience, economic prosperity, political justice and cultural vibrancy to ensure a desirable planet for all species now and in the future. More recently, using a systematic domain model that responds to the debates over the last decade, the Circles of Sustainability approach distinguished four domains of economic, ecological, political and cultural sustainability ; [42] this in accord with the United Nations , Unesco , Agenda 21 , and in particular the Agenda 21 for culture which specifies culture as the fourth domain of sustainable development. Rather, it involves treating all four domainsâ€"economy, ecology, politics and cultureâ€"as social including economics and distinguishing between ecology as the intersection of the human and natural worlds and environment as that which goes far beyond what we as humans can ever know. Human sustainability can be achieved by attaining sustainability in all levels of the seven modalities. Shaping the future[edit] Integral elements of sustainability are research and innovation activities. A telling example is the European environmental research and innovation policy. It aims at defining and implementing a transformative agenda to greening the economy and the society as a whole so to make them sustainable. Research and innovation in Europe are financially supported by the programme Horizon , which is also open to participation worldwide. Additionally, instigating innovative and sustainable travel and transportation solutions must play a vital role in this process. Resilience-thinking evolved from the need to manage interactions between human-constructed systems and natural ecosystems in a sustainable way despite the fact that to policymakers a definition remains elusive. It is also concerned with commitment from geopolitical policymakers to promote and manage essential planetary ecological resources in order to promote resilience and achieve sustainability of these essential resources for benefit of future generations of life? In nature, the accounting occurs naturally through a process of adaptation as an ecosystem returns to viability from an external disturbance. The adaptation is a multi-stage process that begins with the disturbance event earthquake, volcanic eruption, hurricane, tornado, flood, or thunderstorm , followed by absorption , utilization , or deflection of the energy or energies that the external forces created. History of sustainability The history of sustainability traces human-dominated ecological systems from the earliest civilizations to the present day. Coal was used to power ever more efficient engines and later to generate electricity. Modern sanitation systems and advances in medicine protected large populations from disease. In the late 20th century, environmental problems became global in scale. In the 21st century, there is increasing global awareness of the threat posed by the human greenhouse effect , produced largely by forest clearing and the burning of fossil fuels. The focus ranges from the total carrying capacity sustainability of planet Earth to the sustainability of economic sectors, ecosystems, countries, municipalities, neighbourhoods, home gardens, individual lives, individual goods and services[clarification needed], occupations, lifestyles, behaviour patterns and so on. In

short, it can entail the full compass of biological and human activity or any part of it. To shed light on the big picture, explorer and sustainability campaigner Jason Lewis has drawn parallels to other, more tangible closed systems. The environmental impact of a community or of humankind as a whole depends both on population and impact per person, which in turn depends in complex ways on what resources are being used, whether or not those resources are renewable, and the scale of the human activity relative to the carrying capacity of the ecosystems involved. Careful resource management can be applied at many scales, from economic sectors like agriculture, manufacturing and industry, to work organizations, the consumption patterns of households and individuals and to the resource demands of individual goods and services. This formulation attempts to explain human consumption in terms of three components: The equation is expressed: The most prominent among these concepts might be the Circular Economy , with its comprehensive support by the Chinese and the European Union. There is also a broad range of similar concepts or schools of thought, including cradle-to-cradle laws of ecology, looped and performance economy, regenerative design, industrial ecology, biomimicry, and the blue economy. These concepts seem intuitively to be more sustainable than the current linear economic system. The reduction of resource inputs into and waste and emission leakage out of the system reduces resource depletion and environmental pollution. However, these simple assumptions are not sufficient to deal with the involved systemic complexity and disregards potential trade-offs. For example, the social dimension of sustainability seems to be only marginally addressed in many publications on the Circular Economy, and there are cases that require different or additional strategies, like purchasing new, more energy efficient equipment. Sustainability measurement Sustainability measurement is the quantitative basis for the informed management of sustainability. They are applied over a wide range of spatial and temporal scales. Companies such as Lieef www.

Chapter 7 : Smart Cities through Proximity Beacon and Geolocation Technology

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afterword to the 5th international symposium on soil organic matter! Dear colleagues, We would like to say "Thank you" for your participation and support of SOM in GÃ¶ttingen, also and especially on behalf of the scientific committee.