

## 1: Sustainable Development: Goals, Importance and Examples - Conserve Energy Future

*The advantages are so much that they are not exhaustive. First, let's define sustainable development. Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UN Brundtland Commission). So, from the.*

Definition of Sustainable Development Renewable energy sources like wind power and solar power are excellent examples of development strategies that are sustainable. Their sustainability is defined by their reliance upon infinitely available resources that are naturally occurring, constant and free to access. These factors mean that these resources will be indefinitely accessible by humans, which makes them sustainable resources. Sustainable development also needs to take economic and social sustainability into account in order to fit within the parameters of sustainable development. In fact, the United Nations projects that there will be more than 10 billion people living on the Earth by the year 2050. This explosion in population is perhaps one of the greatest reasons why sustainable development is so important. Protect Technological Resources The people coming into this world are coming into an increasingly technological age, where more people than ever are relying on technology for nearly every aspect of their lives. Of course, these technologies are not built out of thin air and good intentions. They require a significant array of minerals and other other inputs simply to be manufactured. Provide Basic Human Needs A rising population will also make use of the bare essentials of life such as food, water, and shelter. The provision of these essentials is based almost entirely around having an infrastructure that can sustain them for the long-term. If energy is continually developed on finite fossil fuels instead of sustainable options, the cost and environmental toll of supplying even basic needs can become staggering. Agricultural Necessity Agriculture will have to catch up with that growing population as well, figuring out ways to feed around 3 billion more people than it currently does. If the same unsustainable tilling, seeding, watering, spraying and harvesting methods are used into the future, they can become very costly as fossil fuel resources run out. Sustainable agriculture practices like crop rotation and effective seeding practices can help to promote high yields while protecting the integrity of the soil as it produces food for larger amounts of people. Accommodate City Development As populations rise, cities will need to become larger to accommodate the influx of new residents. If these cities are developed non-sustainably, they will become more and more expensive to build and maintain over time. This is because the resources being used to develop the cities will be finite fossil fuels that will only get more expensive as they run out over time. The higher volume of these fuels required to produce energy for this larger population will also negatively impact the air quality of cities. If cities use sustainable development practices, they can conceivably make way for new housing and business developments indefinitely. Control Climate Change Climate change is another issue that can be at least partially remedied through sustainable development. Sustainable development practices would mandate a lower use of fossil fuels, which are not sustainable and which produce greenhouse gases. As the population rises, more people will be requiring more energy and will be putting an even greater strain on the world climate. Provide Financial Stability Sustainable development can also produce more financially sustainable economies throughout the world. Jobs built around the "old" model of unsustainable development simply have no place in economies of the future. This has nothing to do with politics or ethics, but rather the bare mechanics of how economies price out finite resources over time. Industries built around a reliance upon a resource that will not be accessible into the future will ultimately fail, leaving sustainable development as the only option moving forward. Sustain Biodiversity Biodiversity suffers through overconsumption and unsustainable development practices. Beyond the basic ethical quandary presented by this fact, there is the further concern that these species are a part of a foodweb that humans rely on. For example, if unsustainable agricultural practices are used in regard to pesticides, bees and other pollinators could be negatively impacted. Also, unsustainable development pollutes the oceans, which are home to a significant amount of algae species that humans rely on for a significant amount of the oxygen they breathe. Speaking Plainly on Sustainable Development In the end, there is no argument beyond a political one when it comes to sustainable development. Sustainable development is cleaner, has the potential to be more efficient, has long-term

potential and is the only way forward for a growing world economy. As more people join them, more of these resources are needed and the faster these resources are depleted. Over enough time, sustainable development will no longer be an option for people who want to feel good about their choices. It will be the only available option for cities and regional development. The question is whether humans have the will to make the transition toward sustainability on their own terms or if they will simply be forced to make a rapid transition when all of the other options finally run out. Was this page useful?

## 2: Why Is Sustainable Development Important? | LoveToKnow

*Benefits of Well-Designed Sustainable Urban Communities* The number of benefits arising from sustainable, higher-density city-building are considerable, as the following list of 42 general benefits demonstrates.

Ecological economics It has been suggested that because of rural poverty and overexploitation, environmental resources should be treated as important economic assets, called natural capital. This model of unlimited personal and GDP growth may be over. Issues of intergenerational equity, irreversibility of environmental change, uncertainty of long-term outcomes, and sustainable development guide ecological economic analysis and valuation. In the economist Edward Barbier published the study *The Concept of Sustainable Economic Development*, where he recognised that goals of environmental conservation and economic development are not conflicting and can be reinforcing each other. What could I say? None exists in that pure form; there are trade-offs, not "win-wins. I wanted to contribute because WDRs are important in the Bank, [because] task managers read [them] to find philosophical justification for their latest round of projects. But they did not want to hear about how things really are, or what I find in my work They enable the effective practice of personal responsibility and the development of mechanisms to protect the environment. The State can in this context "create conditions which encourage the people to save the environment". Misum is a cross-disciplinary and multi-stakeholder knowledge center dedicated to sustainability and sustainable markets and contains three research platforms: Environmental economics The total environment includes not just the biosphere of earth, air, and water, but also human interactions with these things, with nature, and what humans have created as their surroundings. Therefore, solutions need to be found so that the economies of the world can continue to grow, but not at the expense of the public good. In the world of economics the amount of environmental quality must be considered as limited in supply and therefore is treated as a scarce resource. This is a resource to be protected. One common way to analyze possible outcomes of policy decisions on the scarce resource is to do a cost-benefit analysis. This type of analysis contrasts different options of resource allocation and, based on an evaluation of the expected courses of action and the consequences of these actions, the optimal way to do so in the light of different policy goals can be elicited. Further complicating this analysis are the interrelationships of the various parts of the environment that might be impacted by the chosen course of action. Sometimes it is almost impossible to predict the various outcomes of a course of action, due to the unexpected consequences and the amount of unknowns that are not accounted for in the benefit-cost analysis. Smart grid and Sustainable energy Sustainable energy is clean and can be used over a long period of time. Unlike fossil fuels and biofuels that provide the bulk of the worlds energy, renewable energy sources like hydroelectric, solar and wind energy produce far less pollution. These communities are historically left out during the decision-making process, and often end up with dirty power plants and other dirty energy projects that poison the air and harm the area. These toxicants are major contributors to health problems in the communities. As renewable energy becomes more common, fossil fuel infrastructures are replaced by renewables, providing better social equity to these communities.

## 3: 6 Business Benefits of Sustainability | HuffPost

*Preserves functionality and diversity of system while providing a wide range of economic benefits Promotes the diversification of forest products including non-wood forest products (NWFPs) Preserves the natural services provided by forests.*

Tweet Sustainable Tourism not only benefits the environment and the local communities: Sustainable Tourism is of primary importance to our planet and its future. Every year a billion people travel throughout the world one in nearly six people and continue to grow. The forecast maintain that, in , the number of tourists will increase to 1. Growth forecast of the number of tourist in the world between and Source taken from UNWTO In a period of fundamental questions about sustainability for our development model, we are also asking what the environmental, economic and social impacts will be. Tourism and environmental pollution On the one hand, tourism represents one of the biggest economy sectors in the world, which makes it an important growth opportunity for the least developed countries. On the other hand, tourism is one of the major causes of pollution and carbon dioxide production. Sustainable Development and Tourism: Responding to Global Challenges, written by UNWTO and United Nation Environment Programme The growing awareness of the issue of environmental limits of the tourism development is leading us to experiment alternative methods of tourism and accommodations that are environmentally safe and benefit places and local economies. Awareness is increasing of environmental and climatic problems in the same way that knowledge grows of how much each one of us could contribute to solutions to global problems by modifying our way of life. The Italian families as high as 7 out of 10, prefer organic products at least once a year. How are the demand for eco-friendly accommodation increasing? Those who travel is more aware of environmental problems and seek to play his part choosing an eco-friendly accommodation. The same report of asked to responsible travellers how the global economic crisis has affected on their travel programmes. The growth of this type of tourist is much higher than traditional customer segments. Invest in sustainability is not only necessary, but it is also beneficial. Make eco-friendly choices in a tourist accommodation is useful for three reasons at least: It is created an added value for the guests more interested in this issue. Attention for the environment is contagious and allow to do network. The latter aspect is told effectively in this short video You might also like:

## 4: 6 Benefits of Becoming a Sustainable Business - Environmental Leader

*Detractors of sustainability claim that sustainable business practices eat into corporate profit. Development of sustainable business practices lends itself to efficient operation that streamlines effort and conserves resources, which enhances employee productivity and reduces cost.*

These then become the criteria against which success can be measured, because just as with any other business strategy, return on investment will be the ultimate measure of success. License to Operate Speed to Market In business, the old adage "time is money" takes on new meaning. Every delay, whether it be in permitting, construction, recruiting or training employees has an associated cost in lost revenue, particularly in a competitive situation when the preferred company can use the time advantage to establish itself in the market, cherry pick the local talent pool and build relationships with customers and suppliers. Each day that a store remains vacant or a commercial lot lies undeveloped is a day of lost sales revenue for the company. The community does not realize the benefits of having those goods or services available, workers are denied employment, and the community cannot collect sales and income taxes. A company that has a positive reputation has a competitive advantage. While communities may not actively facilitate approval of a permit, myriad of examples exist where community opposition has resulted in substantial delays and requiring a greater investment of time and money. This is a lesson that some sometimes more clearly demonstrated by its failure. So this license to operate demands that we be actively involved in the community. Cost Reduction or Avoidance Most businesses know the importance of investing in preventive maintenance to keep equipment in good working order. Those who do not invest in this manner are considered foolish and viewed with contempt. But there are other, direct ways that businesses can save money through a longer-term approach. Socrates said that "the way to gain a good reputation is to endeavor to be what you desire to appear. In other words, people judge based on the impact of actions, and not intentions. It is unlikely that anyone individual or company can truly achieve perfection. The best case is that when outlying behavior or actions take place, they are more likely to be viewed as aberrations rather than symptomatic of a greater and negative truth. The lessons for corporations are clearly transferable. A company that is viewed as a positive and favorable member of the community is likely to have less opposition, and when -- as is almost inevitable -- a misstep does occur, it is less likely to be perceived negatively. Like any other business expense, a clear case can be made that "reputational" capital, is an investment, built over time and as a long-term strategy. Beyond the "feel good" aspect that is often cited as one of the softer less business focused benefits of sustainability, employee morale and culture are linked to productivity, recruitment and retention. Employees who are passionate about the company and its products are the best advocates and can counteract threats to brand image simply by talking to their neighbors and friends. We link social responsibility to talent retention. One company discovered that employees who had not been informed of the corporate strategy of maintaining a visible presence their market through the routine upkeep of idle equipment were unwittingly compromising the effort by publicly complaining about the "stupid" manager forcing them to paint a non-working production facility. This unintentional sabotage of the company strategy demonstrates the importance of engaging employees in the strategy and the power that they have to impact the success -- or failure -- of its efforts. This failure to include employees results in behavior that can damage profitability directly. Poor morale can lead to passive sabotage in the form of reduced productivity, shoddy workmanship and quality control and increased absenteeism. At its worst, unhappy employees can and do engage in behavior that deliberately hurts the company, such as an employee who shares information about a corporate problem. This can result in damage to corporate image, credibility and the bottom line ranging from lost sales to increased costs due to fines and penalties. Ability to Seize the Innovation High Ground Companies that are looking for ways to be more environmentally, socially and economically responsible are driving innovations in products, services and sourcing as well as financial acumen. Sales of compact fluorescent bulbs initially faltered due to the color of the light emitted. Not only does the planet benefit from the reduction in energy use, but companies like General Electric that produce the bulbs also benefit from increased sales and reputation. Companies that are seen as innovative tend to attract

innovative employees, and the cycle accelerates. And that is good for business. In the area of reputation and brand management, companies that source their products from supplier that engage in sustainable business practices are protected from damage to their brand and reputation from issues such as child labor and living wages. And they are helping prevent these practices by providing a financial incentive -- their business -- for acting in a socially responsible manner. Access to Investment Capital One out of every eight dollars under professional management in the Unites States in involved in socially responsible investing. When the world imposed economic sanctions against the Apartheid government of South Africa, that nation lost access to capital. The Calvert Group was the first mutual fund to leave South Africa when apartheid was instituted but also the first to return after Nelson Mandela was elected and asked the world to reinvest in the country. Businesses can find themselves in the same situation. From to assets involved in social investing have grown 40 percent faster than all professionally managed investment assets in the U. Investment portfolios involved in SRI grew by more than percent from to , compared with the percent growth of the overall universe of assets under professional management over the same time period.

### 5: Four Benefits that Sustainable Tourism Development Ensures for Cuba

*Benefits of Sustainable Development Green building is not a simple development trend; it is an approach to building suited to the demands of its time, whose relevance and importance will only continue to increase.*

All systems and societies naturally develop. However, In this day and age, development is moving at breakneck speeds, thanks to advancement in technology. What would help people achieve that is setting sustainable development goals. Sustainable development is the practice of using guidelines for environmentally responsible and energy savings to create new development projects and to maintain and retrofit older projects. It can include using green materials in new construction , designing projects that can harvest their own energy to reduce load on a power grid , or that incorporate green space in order to counterbalance the green space removed to build the onsite facilities. There is a heavy emphasis on making sure that what is built can be maintained and repaired in a way that minimizes the degradation of the original development so that the lifespan of a facility is longer than normal. Sustainable development involves satisfying the needs of the present population without endangering the capability of future population to satisfy its own needs. Sustainable development also digs deeper. We want to develop innovative technologies while keeping the environment safe. Its focus is much broader than that. Its all about meeting the diverse needs of people in different communities, social cohesion, creating equal opportunity to ensure a strong and healthy society. Sustainable development also focuses on finding better ways of doing things without affecting quality of our life. There are 3 components of sustainable development – economic growth, environmental stewardship, and social inclusion. Countries are recognizing the importance of conserving natural resources, people are switching to cycling instead of driving that will improve their health, farmers are practicing climate smart agriculture and industries are realizing as to how much they can save through energy efficiency. Understanding sustainable development and its goals is the first step to learning what we can do to make it happen. There are many initiatives already in place, but still many roadblocks to sustainable development that have to be overcome. Goals of Sustainable Development There are three primary goals of sustainable development: To minimize the depletion of natural resources when creating new developments. To create development that can be maintained and sustained without causing further harm to the environment. To provide methods for retrofitting existing developments to make them into environmentally friendly facilities and projects. Global organizations such as United Nations, NGOS, aid organizations and even governments are increasingly sponsoring efforts to ensure sustainable development goals are realized for every individual across the board. Some other most important sustainable development goals set by these bodies include: Eradication of poverty across the world These organizations primarily focus on the least developed and low-income countries where poverty is rife. They aim to eradicate poverty across the board by expanding social protection programs like school feeding, cash transfers, targeted food assistance, social insurance and labor market programs such as skill training, old age pensions, wage subsidies, unemployment insurance, disability pensions and so on. Promotion of good health and well being This sustainable development goal seeks to ensure good health and well-being for all at each stage of life. The goal takes into account all the main health priorities such as maternal and child health, reproductive health, environmental, communicable and non-communicable diseases, universal health coverage, and access to quality, safe, effective, and affordable vaccines and medicines. It also advocates for enhanced health financing, increased research and development, strengthening the capacity of every country engaged in health risk prevention and management. Provision of quality education for all These bodies have realized that the level of child school dropout is at an all time high. This gap must be closed to ensure sustainable future development even as international communities work to ensure quality and equity in the education sector. In a nutshell, this goal seeks to ensure equitable and inclusive quality education and promotion of long life learning opportunities. Provision of clean water and sanitation Water and sanitation are on top of the chart regarding sustainable development. They are critical to the survival of humans and the planet. This goal aims to address aspects relating to sanitation, hygiene, drinking water and the quality and sustainability of water resources across the globe. Building up strong

infrastructure, supporting inclusive and sustainable industrialization and incubating innovation This goal takes into account three aspects of sustainable development: Infrastructure is vital because it offers the basic framework necessary to smooth running of enterprise and society at large. Industrialization drives up economic development, yield job opportunities, hence, reducing levels of poverty. Innovation enhances technological abilities of industrial sectors and triggers the development of innovative skills. Enabling Access to affordable and clean energy Energy is the most critical resource to achieving most of the sustainable development goals. Energy plays a vital role in mitigating poverty through advancements in industrialization, education, water supply and health and fighting climate change. This sustainable development goal focuses on developing and expanding renewable energy resources such as sun, wind, hydropower, liquid and solid biofuels, biogas and geothermal. Achieving gender equality In the past few decades, gender equality and women empowerment have been agendas for most governments for long-term sustainable development. Access to education for girls has since improved, the percentage of child marriage has plummeted, and huge leaps have been taken in the domain of sexual and reproductive health and rights such as dramatic reduction in maternal health. Although there is still a long way to go to reach this milestone, organizations are using every ounce of their energy and throwing in resources to ensure the dream is realized. There are other sustainable development goals set by these bodies including decent jobs and economic growth, sustainable cities and communities, conservation of sea, ocean and marine resources, combating climate change, sustainable consumption and production patterns and much more. How Can we Make it Happen? To make sustainable development the norm, we have to change the vision of the cultures of each country. To change the vision of the culture two things have to occur. The culture must value a global benefit more than a local one. A responsibility towards providing and sustaining resources for the future must be of more value than profit in the present must be developed. Both of these are very hard to do because it requires an element of self-sacrifice be adopted by the present society. The value of the future is something that is not held in high esteem when it comes to creating a profit, or to living with convenience. The general self-focus of each generation is understandable, but as history has shown in other areas it can be expanded to include a sense of responsibility towards futures unknown that will allow for different choices to be made in the present. There are two major issues that prevent sustainable development from happening. The first is that for many aspects of development, using sustainable methods and materials is expensive. While the long-term cost of sustainability does prove to be less expensive than traditional development, the creation of a sustainable project may be far more expensive in the first phase. The second major issue is that there is not a generally accepted need for sustainable development. This is an education issue that may take many years to resolve. Contractors and investors cannot see the importance of sustainable projects when they cost more to initiate. When the goal is to make money in the short term, it can be very difficult to generate the long-term vision that is required to understand the importance of sustainability. Towards this end, there are more government regulations and incentive programs that have been put into place to make sustainable development a more attractive option for program and project managers. Importance of Sustainable Development Sustainable development is a hard topic to nail down because it consists of a wide range of things. Population is the main factor driving up sustainable development campaigns. So, the importance of sustainable development can be viewed from this perspective: Provides essential human needs The explosion of population means people will have to scramble for the limited life essentials like food, shelter, and water. Adequate provision of these basic needs almost entirely hinges on infrastructure capable of sustaining them for a long time. If governments insist on utilizing fossil fuel based sources of energy instead of renewable and sustainable options, the cost and environmental effects of supplying these basic needs would become a tall order. Agricultural requirement Growing population means agriculture must catch up. Finding ways to feed more than 3 billion people can be staggering. If same unsustainable cultivation, planting, irrigation, spraying, and harvesting techniques are utilized in the future, they might prove to be financially burdening considering fossil fuel resources are projected to run out. Sustainable development focuses on sustainable agricultural methods such as effective seeding techniques and crop rotation to promote high yields while maintaining the integrity of the soil, which produces food for a large population. Manage climate change Climate change can be mitigated by sustainable

development practices. Sustainable development practices seek to reduce the use of fossil-based sources of fuel like oil, natural gas, and coal. Fossil fuel sources of energy are unsustainable since they will deplete in the future and are responsible for the emission of greenhouse gasses. Financial stability Sustainable development practices have the ability to create more financially sustainable economies across the globe. From the development of renewable energy technologies, these countries can create sustainable jobs as opposed to finite jobs based on fossil fuel technologies. Sustain Biodiversity Unsustainable development and overconsumption practices greatly impact biodiversity. Life ecosystem is designed in such a way that species depend on one another for survival. For instance, plants produce oxygen that humans need for respiration. Humans exhale carbon dioxide that plants need for growth and production. Unsustainable development practices like emission of greenhouse gasses in the atmosphere kill many plant species resulting in reduction of atmospheric oxygen. This is not good for humans. Sustainable development practices encourage the use of renewable energy resources, and organic farming practices that do not emit any greenhouse gas to the atmosphere. Examples of Sustainable Development Wind Energy Wind energy is energy harnessed from the motion of wind using wind turbine or windmills. This makes it a good sustainable development practice. Solar Energy This is energy harnessed from the sun using solar panels. Green Space Green spaces are locations where plants and animals are left to flourish. Parks also fall into the category of green spaces. Green spaces provide people remarkable opportunity to take pleasure in outdoor recreation, more so in big cities, where resting space is hard to come by. Green spaces also help regulate climate and quality of air, insulates rivers and streams from polluted runoff and lowers energy usage by dealing with the warming impacts of paved surfaces. Crop Rotation Crop rotation is the practice of planting different crops in the same farm to enhance soil fertility and assist control diseases and insects. This means using this farming practice maintains integrity of your soil, making it a sustainable development practice. In the long run, there will be no debate about sustainable development. Sustainable development has proven to be cleaner, potentially more efficient, and is the only way to grow our economies without impacting human health and environment. Due to world governments putting more emphasis on sustainable development, more people today are moving towards renewable sources of energy like solar, wind, hydropower and geothermal. As more people join this bandwagon, a lot more of the resources will be required, and this will mean faster depletion of resources. With time sustainable development will not be an option for individuals wanting to live a healthy life and lifestyle choices. Understanding regulations and incentives There is a very real necessity for a change to the regulations and incentives that govern development in order to make sustainable development the better option to choose. However, by using various tax credits and incentive programs assigned to different levels of sustainability in a development program, more of a project can meet the requirements of sustainability.

### 6: Economic and Social Benefits | Copenhagen: Sustainable City

*Sustainable development is an approach to development that takes the finite resources of the Earth into consideration. This can mean a lot of different things to different people, but it most commonly refers to the use of renewable energy resources and sustainable agriculture or forestry practices.*

Cuba received more than three million international tourists in , more than any other year in its history. Most of these tourists come from Canada and Europe, but as you might have heard, Cuba has another huge market entering the mix. An increasingly common scene in Old Havana. The smoothing of relations between the United States and Cuba nations may allow for a massive influx of American tourists in the near future, but for now this is uncertain. With the potential influx of tourists from the United States, will Cuba develop a sustainable tourism model a la Costa Rica , or will they choose to emulate the all-inclusive route so popular throughout the rest of the Caribbean? Cuba has already developed a massive all-inclusive resort enclave, Varadero, on the northern coast a couple hours east of Havana. This mile strand of beach is home to many joint ventures between the Cuban government and foreign companies, and only a small percentage of profits ever benefit the Cuban people. Massive all-inclusive resorts, although becoming more sustainability-focused, have a long history of being unsustainable. Profits depart destinations, environmental degradation occurs, and local traditions are shuttered or commoditized, leading to varying degrees of tourism imperialism. Cuba has developed a few other all-inclusive resorts outside of Varadero, but an overwhelming majority of the island still lends itself to sustainable tourism development. By choosing to move forward with the sustainable tourism model instead of further developing mass all-inclusive resort tourism, four key benefits to Cuba arise:

**Protection of natural areas:** Promoting ecotourism to these parts, while maintaining safe environmental limits, can funnel more money into the conservation and enhancement of these sites or encourage the designation of even more protected areas. Many travelers are seeking an experience beyond the typical sun, sea, and sand of mass tourism. Costa Rica has used this sustainability-focused approach to become the ecotourism epicenter of Central America, if not the world. Sustainable ecotourism has become a dominant part of their destination image, and they have well-preserved resources that will sustain their tourism economy long into the future. Cuba and Costa Rica have similar natural attractions including breathtaking mountains, extraordinary biodiversity, and pristine reefs and wetlands. No other Caribbean island has an array of natural assets to match Cuba. Developing a sustainable tourism model brings an incentive to keep these areas protected long into the future. Solimar International has had success implementing sustainable solutions in a similar situation in the Dominican Republic , encouraging the protection of biodiversity through tourism with small and medium-sized businesses in the face of mass tourism resort development.

**Preservation of cultural heritage:** In addition to amazing natural areas, Cuba has unique cultural tourism assets as well. Perhaps most importantly, these are spread throughout the island and only one is in Havana. Havana will never lack for tourists and distributing visitors throughout the rest of the country will be key to developing in a sustainable way. Linking these UNESCO sites and other cultural attractions together will encourage visitors to stay longer while creating a more authentic experience than all-inclusive resort travel. These outcomes fit the sustainable tourism model as profits would increase due to longer stays while spreading beyond the resorts and Havana. The socialist history of Cuba is a tourism asset in and of itself. This way, Cuba can show their cultural heritage while further developing the authentic sense-of-place that encourages repeat visits and promotes a positive destination image. By moving visitors and profits beyond the resorts and Havana, Cubans have more incentive to simply act naturally and be themselves instead of putting on tacky, commoditized representations of themselves at the all-inclusives. Solimar International has previously demonstrated how tourism can be a catalyst for protecting cultural heritage while increasing local revenue in Fez and Marrakech, Morocco. In theory, this sounds great, but what is the vehicle for achieving this goal? One option would be to facilitate the formation of private enterprise and entrepreneurial development, which has led to innovation, efficiency, and coordination in the tourism sector in other destinations. In recent years, the Cuban government has slowly integrated private enterprise into the economy. This has been undertaken largely to reduce dependence upon

the government, which can no longer supply everyone with jobs or a livable wage, and to bring black market activities into the formal economy. As private enterprise becomes more viable, competition will lead to innovation and increased efficiency in the tourism industry. The Cuban people, who are quite resilient and creative, have actually had to develop a sort of entrepreneurial spirit over the years to overcome economic hardships. These networks have come together to solve problems time and time again. Cuban citizens view tourism as an engine for enterprise creation, mainly in the forms of *casas particulares* rooms available for tourists to rent in private homes, *paladares* small, privately-owned restaurants and transportation services. Patronizing these businesses undoubtedly leaves the impression of an authentic experience in the minds of travelers while simultaneously contributing to the well-being of local residents via increased income. However, categories of legal self-employment are still restricted in Cuba. For example, Cuban citizens cannot be self-employed as tour guides, although the government has shown a recent affinity for being more responsive than in the past. Further developing private enterprise in tourism disseminates the benefits of tourism beyond the top level, reduces leakage, and creates competition. Competition is vital to innovation and a constantly evolving tourism product. Solimar International has experience in facilitating new sources of income for people via small, entrepreneurial tourism ventures, specifically in Mali. As Cubans transition from government-provided jobs, they will continue to see the tourism industry as a viable alternative. Improved well-being of Cuban citizens As sustainable tourism catches on, Cubans will have access to more jobs and careers, higher earning potential, cross-cultural interaction, and new skills and training. A successful tourism industry with a healthy private sector component reduces dependence upon the government while empowering Cuban citizens to forge their own path. If Cuba can develop tourism similarly to the Costa Rican model, the results will be well-maintained natural areas and cultural sites which will provide jobs and careers well into the future. All of these developments contribute to improved financial security and overall well-being for Cuban citizens. A new dawn for Cuba? I see the potential for these four benefits to "spiral up" to create a sustainable tourism model in Cuba. If private enterprise flourishes, resident well-being increases, thus providing further incentive to protect natural and cultural heritage. Cuba has fantastic natural and cultural attractions, and once Cuban citizens gain more sovereignty in the business development process, the potential for innovative and sustainable tourism products is infinite. Of course the government will still be a key figure in this development, but it can help by enforcing environmental regulations and supporting programs to preserve cultural identity. Sustainable Tourism program, I worked with Dr. Carol Kline on my M. My research examines the relationship between private enterprise and tourism development in Cuba. I traveled to Cuba as part of a research team to interview residents about these topics. The possible influx of U. These decisions will determine the long-term success of tourism on the island and who benefits. I joined Solimar International, one of the leading sustainable tourism development firms with the hope that combining my knowledge of Cuba with their experience can help Cuba follow the right path to development. Last modified on Wednesday, 08 April

## 7: Benefits of space: Sustainable Development

*"Sustainable Development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The aim of SD is to balance our economic, environmental and social needs.*

Environmental Effects As with production and use of any fuels, aspects of biofuel production and use have benefits and adverse effects. This chapter discusses potential environmental effects from the production and use of algal biofuels, the potential influence of perceived or actual impacts on societal acceptance, and some of the health impacts potentially emanating from the specific environmental effects. Potential environmental effects discussed in this chapter include those resulting from land-use changes, water quality, net greenhouse gas GHG emissions, air quality, biodiversity, waste generation, and effects from genetically engineered algae with an emphasis on new or enhanced traits. Page Share Cite Suggested Citation: The National Academies Press. Environmental indicators of sustainability and data to be collected to assess sustainability are suggested. In some environments and biofuel management systems, metrics for assessing environmental performance are easy to measure and adequate baseline data are available, but that is not the case in all systems. A number of potential environmental concerns are evident, and if the concerns are not addressed they could become significant risks under large-scale deployment. As in any other industrial or agricultural enterprise, once they are recognized, such risks can be managed by standards or regulations so that industry is required to reduce effects to acceptable levels. For the sake of comprehensiveness, a number of potential environmental risks are mentioned in this chapter, but some are less likely to occur than others. Some of the environmental risks might require exploratory assessment and subsequent monitoring to ensure that they do not become sustainability concerns if algal biofuel production is scaled up. Water-quality concerns associated with commercial-scale production of algal biofuels, if sufficient culture waters are released to natural environments, include eutrophication of waters, contamination of groundwater, and salinization of water sources. Potential water-quality benefits are reduced runoff of herbicides and insecticides compared to corn-grain ethanol or soybean-based biodiesel because of their reduced use, and reduced eutrophication if there are no releases of culture water or if algae are used as a means to remove nutrients from municipal waste, confined animal feeding operations, and other liquid wastes. Water-quality effects will depend on the nutrient content of the algal culture medium; whether feedstock production systems are sealed, artificially lined, or clay lined; and the likelihood of extreme precipitation events. Leakage of culture fluid to groundwater or surface water could occur if the integrity of the pond or trough system is compromised, if flooding occurs, or if spills occur during transfers of fluid during process stages or waste removal, but most of these events could be avoided with proper management. The liquid effluent also can be recycled from anaerobic digestion of lipid-extracted algae to produce biogas Davis et al. If harvest water is to be released instead of recycled, it or effluent from anaerobic digestion would contain nitrogen N and phosphorus P, the concentrations of which depend on the nitrogen and phosphorus taken up by the harvested algal biomass Sturm and Lamer, Released waters could be more saline than receiving waters, particularly if water from saline aquifers is used for algae cultivation. Such point-source discharge will be regulated by the Clean Water Act, and a National Pollutant Discharge Elimination System permit would have to be obtained to operate the algae cultivation facilities EPA, a. However, permit violation has been observed in some biofuel refineries Page Share Cite Suggested Citation: Regulation and compliance assurance would address concerns about release of harvest water. The potential for accidental release of cultivation water exists; for example, clay or plastic liners could be breached through normal weathering or from extreme weather events, some of which are predictable. High precipitation or winds could lead to overtopping of ponds or above-grade raceways. In those cases, the entire contents of algal cultures could be lost to surface runoff and leaching to surface water or groundwater. Siting in areas prone to tornadoes, hurricanes, or earthquakes would increase the likelihood of accidental releases. However, producers are likely to take preventive measures when extreme weather events are forecasted, and they would put effort into preventing accidental releases of cultivation water because such events could adversely affect

their profit margin. Even where nitrogen and phosphorus are not in oversupply, the total nutrient concentrations in algal biomass will be high. Although accidental release of cultivation water into surface water and soil is unlikely, such an event could lead to eutrophication of downstream freshwater and marine ecosystems, depending on the proximity of algal ponds to surface and groundwater sources. Eutrophication occurs when a body of water receives high concentrations of inorganic nutrients, particularly nitrogen and phosphorus, stimulating algal growth and resulting in excessive algal biomass. As the algae die off and decompose, high levels of organic matter and the decomposition processes deplete oxygen in the water and result in anoxic conditions Smith, ; Breitburg et al. In some cases, eutrophication-induced changes could be difficult or impossible to reverse if alternative stable states can occur in the affected ecosystem Scheffer et al. Eutrophication effects have been well studied, and they depend on the nutrient loadings to the receiving waters and the volume and residence time of water of these systems Smith et al. High nutrient loading could lead to anoxia in the deep cool portion of lakes or in hypoxia in the receiving water bodies. Potential biotic effects of eutrophication include changes in algal density and in the structure and biomass of the broader ecological community Scheffer et al. Fish yield is affected by phytoplankton biomass and by the nutrient ratios in the edibility of phytoplankton Oglesby, ; Bachmann et al. Nutrient levels play a key role in determining the productivity and structure of the primary producing community in estuaries and coastal marine waters Deegan et al. Nutrient-enriched shallow marine systems tend to have a reduced seagrass community Burkholder et al. Seagrasses affect the entire estuarine food web because they stabilize sediments; serve as habitats and temporary nurseries for fish and shellfish; are sources of food for fish, waterfowl, benthic invertebrates, or manatees; and provide refuges from predation. Eutrophication and other nutrient-related effects could be a concern for cultivation of microalgae or macroalgae in large suspended offshore enclosures for example, Honkanen and Helminen, Eutrophication also has implications for social acceptability Codd, , for example, because of eutrophication-related aesthetic concerns Grant, , and aesthetics can affect the recreational value of water bodies. It is unknown whether rare releases of culture water or the physical appearance of open ponds for algae cultivation could have negative effects on the social acceptability of algal biofuels. These culture systems can be designed and tested to withstand natural disasters that are possible during the lifetime of the infrastructure. In coastal locations, for example, facility and infrastructure designs would need to consider the probabilities that hurricane winds and water surges could reach the algae cultivation site Guikema, Mitigation plans for accidental releases would be desirable. Open-pond algae cultivation also can be sited in locations that are not prone to hurricanes or away from lakes and streams. With respect to harvest water, engineering solutions can maximize recycling. Herbicides often are added to open systems to prevent growth of macrophytes and for selective control of algae NALMS, , but their application likely would be regulated as in the case of agriculture. If wastewater or oil well-produced water Shpiner et al. Wastewater could include industrial effluent Chinnasamy et al. The composition and amount of toxicants vary by the type of wastewater. Produced water water contained in oil and gas reservoirs that is produced in conjunction with the fossil fuel may contain high levels of organic compounds, oil and grease, boron, and ammonia NH<sub>3</sub> Drewes et al. Many algal species including cyanobacteria, diatoms, and chlorophytes can bioconcentrate heavy metals Watras and Bloom, ; Vymazal, ; Mathews and Fisher, Therefore, potential risks from using each type of produced water need to be identified so that adequate containment and mitigation measures can be implemented in cultivation and processing. Waterborne toxicants toxic substances made or introduced into the environment anthropogenically, not including algal toxins potentially pose risk to humans or other Page Share Cite Suggested Citation: Occupational exposures could be significant, especially during the harvesting phase. Thus, monitoring of toxic compounds in the culture media is important. Potential toxicity exposure to animals through drinking is discussed in the section on terrestrial biodiversity. The release of culture waters to natural environments could pose other risks to animal consumers. Cultivation of algae in wastewater may require special handling and means of containment. Monitoring for the presence of toxicants or pathogens might be necessary to ensure the quality of the culture water. If so, technical solutions for removing waterborne toxicants would be needed to prevent occupational and ecological exposures. Mercury is removed from flue gas in some configurations of coal-fired electric-generating units EPA, However, mercury removal is

ineffective for certain types of coal and plant configurations NETL, Contaminants in flue gas could place another constraint on the type of coal-fired electricity facilities that would be suitable for providing CO<sub>2</sub> for algae cultivation see sections Estimated Land Requirements and Estimated Nutrient Requirements in Chapter 4. If outdoor ponds are poorly lined or the lining fails as a result of wear, then seepage of the pond water into the local groundwater system could occur. Clays that are compacted and graded have structural integrity that can be comparable to synthetic liners Boyd, However, integrity can be compromised by poor construction. Nitrate leaching has been observed below structured clay soils White et al. Local terrestrial vegetation might take up some of the culture media released through seepage. In some areas, if open ponds contain high concentrations of dissolved inorganic nitrate, seepage may contribute to concerns related to nitrate poisoning if the groundwater is used for drinking by livestock or humans. Withdrawal of freshwater adjacent to briny aquifers or injection of saline wastewater into the ground could result in salinization of groundwater if fresh water and briny aquifers are not well separated. Salinization of groundwater is a potential problem for some agricultural lands where irrigation is prevalent Schoups et al. However, one of the key advantages of algal biofuel is that the feedstock could be produced on nonarable land Ryan, ; Assmann et al. Where open systems are used, technologies such as the development of impermeable, long-lived liner systems and regional solutions for minimizing nutrient leakage could be deployed, and regulations to minimize leakage could be developed. For example, Phyco BioSciences uses a trough system that has a lightweight, fabricated liner. The liner is expected to eliminate leakage or minimize percolation to less than 0. Potential preventive measures might include specifications for soil type, combined with defined values for the minimum depth from the pond bottom to groundwater. Moreover, local regulations likely require lined ponds, which would reduce the probability of leakage of waters but contribute to capital costs and lead to temporary system closures when the liners are replaced because of wear or failure. Measures to prevent inadvertent discharge of water for example, overflow corridors or basins during extreme weather events would be helpful in preventing water pollution. Microalgae have been used in wastewater treatment for a long time Oswald et al. Microalgae have been shown to be effective for wastewater treatment in diverse systems including oxidation stabilization ponds and shallow raceway systems and using both phytoplankton and periphyton Green et al. High rate algal ponds HRAPs , which are shallow, open raceway ponds used for treating municipal, industrial, and agricultural wastewater, combine heterotrophic bacterial and photosynthetic algal processes Park et al. The ponds allow the growth of high-standing crops of algae, which remove nitrogen and phosphorus from the wastewater Sturm et al. The concept of adapting HRAPs for the purpose of biofuel production was proposed more than five decades ago Oswald and Golueke, The feasibility and scale of such systems will be determined by the amount of wastewater, the availability of land near the facilities generating the wastewater and produced water, and the climatic conditions of the region. See also Chapter 4. If wastewater is used, the wastewater treatment rate and the harvesting schedule would determine the maximum volume of ponds or photobioreactors. A major goal of wastewater treatment is removal of nitrogen and phosphorus Pittman et al. In conventional treatment systems, phosphorus is especially difficult to remove Pittman et al. In advanced wastewater treatment, phosphorus typically is either chemically precipitated using aluminum- or iron-based coagulants to form an insoluble solid, or it is stripped from the water by microbial activity EPA, The recovered phosphorus is then buried in a landfill or treated to create sludge fertilizer Pittman et al. Given that readily available supplies of phosphorus may begin running out by the end of the 21st century Vaccari, , conservation and stewardship of U. Recycling nutrients from wastewater and using them for further algae production could be an attractive option for using otherwise discarded nutrients Exhibit 9. Moreover, because harvested algal biomass contains the nutrients that were absorbed during cellular growth, wastewater-integrated systems can perform an important nutrient removal service. In laboratory-scale experiments, more than 90 percent of nitrogen and 80 percent of phosphorus were removed from primary treated sewage by the green alga *Chlorella vulgaris* Lau et al. Similarly, laboratory cultures of *Chlorella* and *Scenedesmus* removed 80 to percent of NH<sub>3</sub>, nitrate, and total phosphorus from wastewater that already had undergone secondary treatment Martinez et al. They reported only a 19 percent removal of dissolved nitrogen and a 43 percent removal of dissolved phosphorus from this treated effluent. These differences in nutrient removal observed may be related, in part, to the different scales

of the studies. The ultimate level of nutrient removal benefit may depend on the level of wastewater treatment that occurs prior to nutrient uptake in the algal cultivation systems and on the chemical and ecological conditions that exist in the wastewater-fed production system.

### 8: Methods and Benefits of Sustainable Agriculture - Conserve Energy Future

*Sustainable Tourism not only benefits the environment and the local communities: it has also economic advantages. Let's go to discover why choose eco-friendly accommodations is so important today. Sustainable Tourism is of primary importance to our planet and its future.*

March 24, Over the past two decades, sustainability has become more than a fad or just a buzz word. Research shows that sustainability has real business benefits when conscientiously integrated into business operations. Six major advantages for practicing sustainability are: Improved brand image and competitive advantage. Surveying more than 53, U. That translates into a client base of 68 million Americans who are favorably predisposed to companies showing positive track records in personal, social, and environmental values. The Cause Marketing Forum reports that consumers also favor companies that actively support their communities: We can live without electricity or paperâ€”people did just that for millenniaâ€”but humanity cannot exist without water, especially potable water. Encouragement and practice to conserve resources not only improves brand awareness, but also penetrates at a deeper level to employees, their families, and beyond. Increase productivity and reduce costs. Detractors of sustainability claim that sustainable business practices eat into corporate profit. Development of sustainable business practices lends itself to efficient operation that streamlines effort and conserves resources, which enhances employee productivity and reduces cost. Reducing cost also encompasses energy conservation strategies that can be as simple as turning off unnecessary lights and insulating walls to more sophisticated efforts such as installation of geothermal heating and cooling systems. Those efforts having greater overall impact will likely be more expensive to implement, but the long-term results justify the investment. Increase business ability to comply with regulation. Integrating sustainability into your business will position it to meet changing regulations in a timely manner. Attract employees and investors. People like to be associated with the positive, especially younger generations raised on a steady diet of environmental protection messages. They do not want to be linked to companies implicated in ecological disasters and social welfare scandals. Show your company as respectful of the environment and of its employees and it will attract the caliber of people whom you want to employ and the funds your business needs to expand. This is likely the simplest and most obvious way to engage in sustainable practices. Beginning in the s with offices collecting empty cans for recycling, the effort has grown to encompass waste mitigation in paper conserving trees and forest habitats , value engineering of products reworking or developing new processes that use less raw materials, waste less material in production of goods , to changing out incandescent lights for LED lights greater efficiency combined with fewer bulbs used. Not only can sustainability be used to lower costs, but it can result in increasing profit. McKinsey reported similar results for studies conducted by the Carbon Disclosure Project. Those assertions are supported by calculations related to share price: It takes dedication, commitment, and follow-through from the C-suite to rank-and-file employees to jump on board the sustainability bandwagon and make it succeed. However, if your business can do it, morale and productivity will improve even as sales increase and costs decrease. With over 5 years of experience and knowledge in the insurance industry, Michael contributes his level of expertise as a leader and an agent to educate and secure coverage for thousands of clients.

### 9: Benefits of Becoming a Sustainable Business // Eco-efficiency

*The Sustainable Development Goals benefit business by fostering a healthy, more productive labor force and by raising the purchasing power of citizens in developing countries. These two factors hold potential profits far beyond those found in any single industry.*

Is Renewable Energy Sustainable? How can we live within our means when those very means can change, swiftly and unexpectedly, beneath us? Sustainable agriculture differs greatly from industrial agriculture where large volumes of crops as well as livestock are produced for sale using industrial techniques. Industrial agriculture relies heavily on pesticides and chemical fertilizers and other chemical enhancers. In the past decade the majority of food we ate has been grown in this manner. However in the last couple of years, due to the negative aspects of the technique, there has been a slight shift towards the use of sustainable agricultural methods. Methods of Sustainable Agriculture 1. Crop rotation is one of the most powerful techniques of sustainable agriculture. Its purpose is to avoid the consequences that come with planting the same crops in the same soil for years in a row. It helps tackle pest problems, as many pests prefer specific crops. If the pests have a steady food supply they can greatly increase their population size. Rotation breaks the reproduction cycles of pests. During rotation, farmers can plant certain crops, which replenish plant nutrients. These crops reduce the need for chemical fertilizers. Many farmers choose to have crops planted in a field at all times and never leave it barren, this can cause unintended consequences. By planting cover crops, such as clover or oats, the farmer can achieve his goals of preventing soil erosion, suppressing the growth of weeds, and enhancing the quality of the soil. The use of cover crops also reduces the need for chemicals such as fertilizers. Soil is a central component of agricultural ecosystems. Healthy soil is full of life, which can often be killed by the overuse of pesticides. Good soils can increase yields as well as creating more robust crops. It is possible to maintain and enhance the quality of soil in many ways. Some examples include leaving crop residue in the field after a harvest, and the use of composted plant material or animal manure. In order to maintain effective control over pests, it is important to view the farm as an ecosystem as opposed to a factory. For example, many birds and other animals are in fact natural predators of agricultural pests. Managing your farm so that it can harbor populations of these pest predators is an effective as well as a sophisticated technique. The use of chemical pesticides can result in the indiscriminate killing of pest predators. Bio intensive Integrated Pest Management: Integrated pest management IPM. This is an approach, which really relies on biological as opposed to chemical methods. IMP also emphasizes the importance of crop rotation to combat pest management. Once a pest problem is identified, IPM will mean that chemical solutions will only be used as a last resort. Instead the appropriate responses would be the use of sterile males, and biocontrol agents such as ladybirds. Contributes to Environmental Conservation: The environment plays a huge role in fulfilling our basic needs to sustain life. In turn, it is our duty to look after the environment so that future generations are not deprived of their needs. Sustainable agriculture helps to replenish the land as well as other natural resources such as water and air. This replenishment ensures that these natural resources will be able for future generations to sustain life. Sustainable agriculture avoids hazardous pesticides and fertilizers. As a result, farmers are able to produce fruits, vegetables and other crops that are safer for consumers, workers, and surrounding communities. Through careful and proper management of livestock waste, sustainable farmers are able to protect humans from exposure to pathogens, toxins, and other hazardous pollutants. Sustainable agriculture means that any waste a farm produces remains inside the farms ecosystem. In this way the waste cannot cause pollution. The use of sustainable agriculture reduces the need for fossil fuels , resulting in significant cost savings in terms of purchasing as well as transporting them. This in turn lessens the overall costs involved in farming. Sustainable farms produces a wide variety of plants and animals resulting in biodiversity. During crop rotation, plants are seasonally rotated and this results in soil enrichment, prevention of diseases, and pest outbreaks. Sustainable agriculture results in animals being better cared for, as well as treated humanely and with respect. The natural behaviors of all living animals, including grazing or pecking, are catered for. As a result they develop in a natural way. Economically Beneficial For Farmers: In exchange

for engaging with sustainable farming methods, farmers receive a fair wage for their produce. This greatly reduces their reliance on government subsidies and strengthens rural communities. Practicing sustainable agriculture techniques also benefits workers as they are offered a more competitive salary as well as benefits. They also work in humane and fair working conditions, which include a safe work environment, food, and adequate living conditions. Sustainable agriculture reduces the need for use of non-renewable energy resources and as a result benefits the environment. This is by no means a small challenge, but unlike many other sustainability challenges, everyone can play a part. We all need to eat, but by simply reducing food loss and waste, as well as eating diets that are lower impact, and investing in sustainable produce, we can make a difference. From countries, to companies, right down to consumers, we all have a role to play. The challenge is simply making people care in a world where we are surrounded by such abundance.

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