

Planning of Sustainable Town

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Abstract - Sustainable township builds a Town for a healthy future. In general, development experts agree that sustainable cities should meet current needs without sacrificing the ability of future generations to meet their needs. That's why we adopt sustainable community ideas and concepts and design entirely new communities. We are adding various amenities and facilities using natural hot springs. Equipment such as rainwater harvesting that collects and stores rainwater. We are also adding solar panels to specific homes and local parking lots that generate electricity. We are also adding sewage treatment plants to our town to collect and filter all liquid waste from all households. This water can be used for gardening and community water. Limit vehicle fuel consumption in the area and use electronic vehicles in the area to maintain a healthy environment in the area.

1. INTRODUCTION

In today's vast world sustainable development, non-renewable energy, net zero energy concept and green energy concept and similar topics took all the interest to most of the researchers around the globe. We have many commercial buildings around us which uses more resources of the environment which comes or generate from non-renewable sources. Energy consumption in nearby buildings and cities are at a large scale comes from non-renewable sources of energy, which can be suitably shifted to renewable sources of energy. It is estimated that 50% of the world's population now live in cities. With this migration into large urban centres, the difficulty of meeting the basic needs of millions has become an ever-increasing problem. Overpopulation, overconsumption, pollution and resource depletion create environmental and health challenges in major cities.

Social sustainability revolves across the human element as a prerequisite for a sustainable town and a sustainable society. The government's sustainability method consequently denotes the belief that everybody ought to take part within the social improvement and feature same possibilities, no matter the background. A targeted and sustained social sustainability paintings allows to make sure diversity, democracy and equality in cities. A sustainable town is socially related to the truth that there are democratic areas in which human beings can meet no matter social, monetary and cultural backgrounds and offer possibilities for deployment and accessibility for all of the residents of the town.

1.1 Solar Power Plant

Photovoltaic plants are based on the conversion of sunlight into electricity, either directly through photovoltaics (PV) or indirectly through concentrating solar energy (CSP). Concentrated solar energy systems use lenses, mirrors, and tracking systems to focus a large area of sunlight into a small beam. Photovoltaics use the photoelectric effect to convert light into electricity. The use of these products is increasing day by day after recognizing the importance of utilizing solar energy. The government is also taking the initiative to raise public awareness by introducing incentives for solar products. Installing a solar power plant is very beneficial in every way, not just in your pocket, but for the whole world. This solar system is being actively used to convert the energy of the sun into a usable format that can be used to power all types of devices. Concentrated solar energy systems use mirrors, lenses, and tracking systems to focus a large area of sunlight into a small beam. The photoelectric effect converts light into electricity. All countries around the world have decided to use solar products widely. As we all know today, we are contributing to the protection of our environment with the help of solar energy. Apart from that, it's a one-time investment and you don't have to spend a lot of money on electricity over and over again.

1.2 Waste Water Treatment Plant

Wastewater treatment is the process of removing pollutants from wastewater and turning it into wastewater that can be returned to the water cycle. After being returned to the water cycle, the wastewater has an acceptable impact on the environment or is reused for a variety of purposes called water regeneration. The treatment process takes place in a sewage treatment plant. There are different types of wastewater that are treated in the right type of wastewater treatment plant. In the case of domestic wastewater, also known as municipal waste or sewage, the treatment plant is called a sewage treatment plant. Industrial wastewater is usually treated after pre-treatment in either another industrial wastewater treatment plant or a wastewater treatment plant. Other types of sewage treatment plants include agricultural sewage treatment plants and leachate treatment plants. Commonly used methods are phase separations such as sedimentation and biological and chemical processes such as oxidation and polishing. The main by-product of wastewater treatment plants is a type of sludge, which is usually treated in the same or different

wastewater treatment plants. Some wastewater can be treated in large quantities and reused as treated water.

1.3 Rain Water Harvesting

Rainwater harvesting (RWH) is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof like surface and redirected to a tank, cistern, deep pit, well, shaft, or borehole, aquifer, or a reservoir with percolation, so that it seeps down and restores the ground water. Dew and fog can also be collected with nets or other tools. Rainwater harvesting differs from stormwater harvesting as the runoff is typically collected from roofs and other surfaces for storage and subsequent reuse. Its uses include watering gardens, livestock, irrigation, domestic use with proper treatment, and domestic heating. The obtained water can also be used for long-term storage and groundwater concentration. Stormwater harvesting is one of the simplest and oldest methods of self-sufficiency in household water that has been used in India and other countries for thousands of years. The system can be designed for different sizes, such as residential, neighbourhood, and community. It can also be designed for facilities such as schools, hospitals and other public facilities.

1.4 Town Planning

Town planning is the process of managing land resources. This includes managing existing and new developments and creating strategies to ensure that future requirements are met. This is a dynamic process that changes according to policies, development proposals, and local needs. Urban planners must strive to balance the needs of landowners and developers with the needs and concerns of the community and political environment. Successful planning can help protect the environment, promote and promote regeneration, help create and maintain communities, and create new and exciting places. Town planning preserves the best of the past while encouraging creativity and innovation in developing a sustainable future.

2. NECESSITY

Sustainable township is defined as a livable place to meet the diverse needs of today's and future communities. It was also stated that the basis of the concept of sustainable development is a balanced approach to managing the environment.

With rapid urbanization, people are attracted to cities and urban areas and want to get more and more facilities and equipment to survive in better living conditions. As a result of that trend, the limits of cities are increasing day by day.

For this reason, further development is underway to meet the needs of all sectors and plans, including residential, commercial, employment, facilities and medical facilities. Increased demand and development are ubiquitous and

clearly not well managed. Therefore, there are papers on proper planning and proper management in urban areas.

3. METHODOLOGY

3.1 Data Collection

3.1.1 Sustainable Materials for Building

Precast concrete slabs -

slabs are formed on-site by the manufacturer and shipped to the site throughout the section. Some are made entirely of concrete, but there is a large hollow space like a burnt block. Precast concrete elements are used for walls and building façade because they can withstand all kinds of weather, while other elements can be used for floors and flat roofs.

Recycled Wood -

Using recycled wood is one of the most environmentally friendly ways to protect trees and reduce the amount of wood that can be landfilled. Recycled timber can be found in retired barns, excavators, home remodeling companies and contractors, junkyards, transport crates and pallets. Recycled wood is suitable for framing, cabinets and flooring.

Recycled Steel -

Steel is 100% recyclable, significantly reducing the environmental impact of new construction. Mining, heating and forming aluminum and steel products require a lot of energy, but by properly and efficiently reusing or recycling them into new products, we reduce energy consumption and make our materials more sustainable. Recycled metal is durable and does not need to be replaced frequently.

Rigid Vegetable Polyurethane Foam -

Rigid foam has long been used as insulation in construction. It is used in the manufacturing process of turbine blades and furniture. The material is rigid and relatively immobile, so it can be used as a heat insulating material. In addition, it provides protection against mold and pests. In addition, it is heat resistant, protects against mold and pests, and can fully function as soundproof.

Ferrock -

This is a relatively new material, using recycled materials such as steel powder from the steel industry and recycled materials such as iron rock that are left over from industrial processes and usually become landfills. It creates a concrete-like building material that is stronger than the concrete itself, and traps and absorbs carbon dioxide in the process of drying and hardening. This makes Ferrock CO₂-neutral and emits much less CO₂ than traditional concrete. A viable alternative to cement, it can be mixed and poured to form driveways, stairs, paths and other structures.

3.1.2 Planning And Designing In AutoCAD

AutoCAD is a commercial computer-aided design (CAD) and drafting software application. AutoCAD was developed and marketed by Autodesk and was first released in December 1982 as a desktop app that runs on a microcomputer with an internal graphics controller. Prior to the introduction of AutoCAD, most commercial CAD programs ran on mainframes or minicomputers, with each CAD operator (user) working on a separate graphics terminal. AutoCAD can also be used as a mobile and web app.

AutoCAD is used in the industry by architects, project managers, engineers, graphic designers, urban planners and other professionals.

Plans

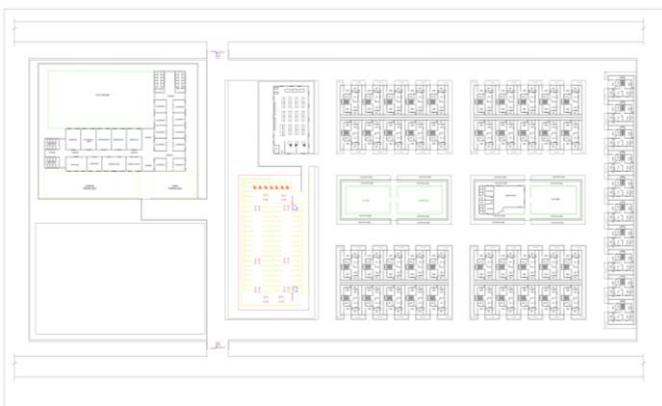


Fig -1: 2D Design of Town Plan

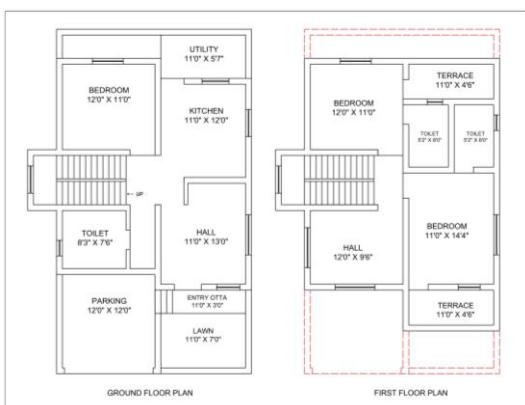


Fig -2: 2D Design of House

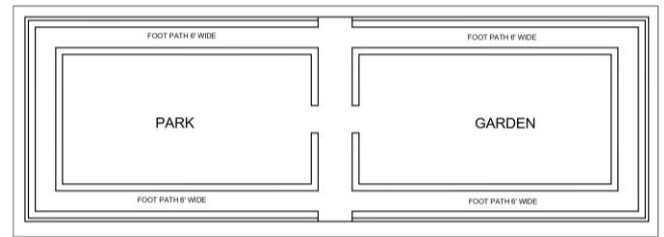


Fig -3: 2D Design of Park and Garden

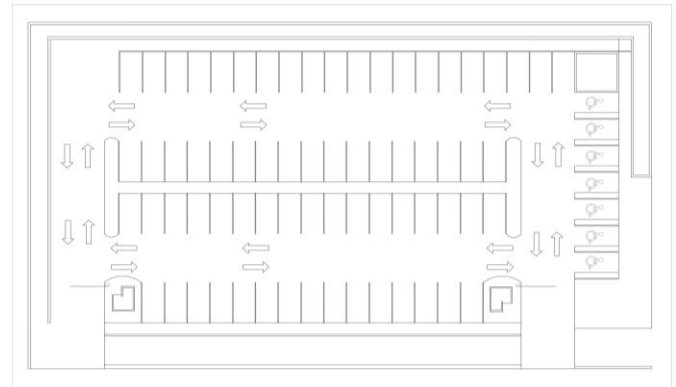


Fig -4: 2D Design of Solar Parking

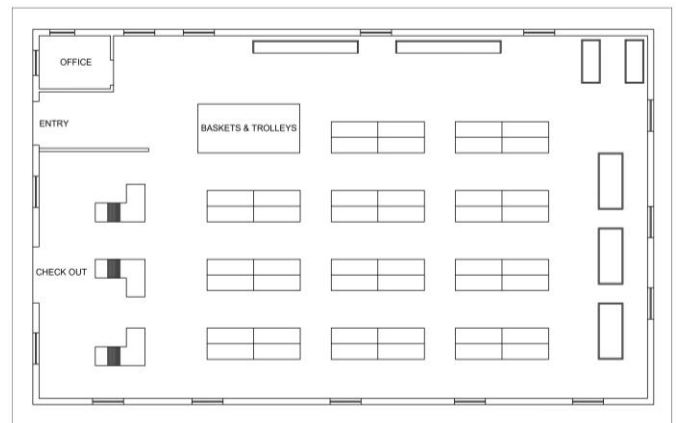


Fig -5: 2D Design of Super Market

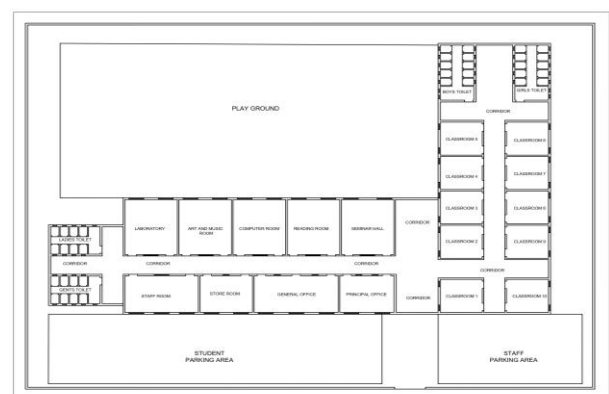


Fig -6: 2D Design of School

3.1.3 3D MODELING

We create 3D models of some of the buildings in our city. Create a 3D model using the SketchUp software.

SketchUp –

Sketchup (formerly Google Sketchup) is an easy-to-use 3D modeling software with an extensive database of custom models for download. You can use it to sketch (or import) your model for all kinds of projects.

3D Design



Fig -7: 3D Design of House

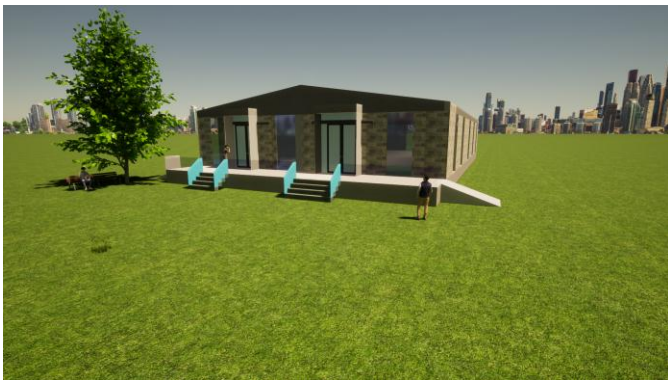


Fig -8: 3D Design of Super Market



Fig -9: 3D Design of School



Fig -10: 3D Design of Gym

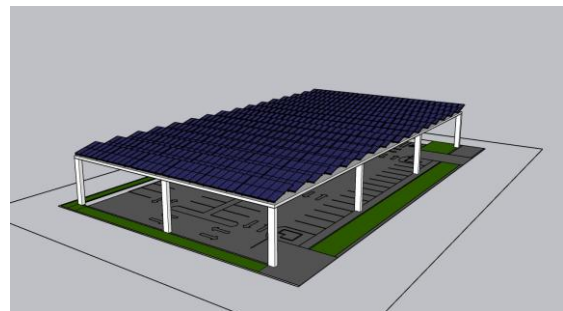


Fig -11: 3D Design of Solar Parking

3.1.4 PREPARE MODEL

We making physical model of the town which we design in AutoCAD. We using hard foam to making the buildings and compound walls. First we print the design of town plan on A1 size paper and fix on same size foam. Then we cutting the small pieces of foam of size is the printed plan and joint together. Then we coloring that pieces as we want. After coloring, draw windows, doors and solar panels. Finally, fix the foam building to the plan.



Fig -12: Model of Town

3. CONCLUSION

We are doing this project for future and we think that it will help us. So basically it is helpful for environment. But as per human tendency no one is thinking about environment and cleanliness. So apart from environment it is also economical friendly also, due to this project we can save some amount of money. And also we are using natural resources to produce energy so no harm for our environment. And it is

lifetime investment just we have to take maintenance of those machines or equipment. So these are the things we are presenting from our project.


ACKNOWLEDGEMENT


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REFERENCES


- [1] Yigitcanlar, T., Dur, D., & Dizdaroglu, D. (2015). "Towards prosperous sustainable cities: A multiscale urban sustainability assessment approach. Habitat International", 45(1), 36-46.
- [2] Kondepudi, S. N. (2014). "Smart sustainable cities analysis of definitions. The ITU-T focus Group for Smart Sustainable Cities, United Nations, Washington".
- [3] Wheeler, S., "Planning for sustainability: Creating Liveable, Equitable and Ecological Communities, Routledge": London, 2013.
- [4] Graham, P., P. B., "Guidlines on education policy for sustainable built environment, UNEP": Nairobi, Kenya, 2010
- [5] Roy, M. (2009). "Planning for sustainable urbanisation in fast growing cities": Mitigation and adaptation issues addressed in Dhaka, Bangladesh. Habitat International, 33(3), 276-286.


BIOGRAPHIES

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