VERTICAL DESIGN APPROACH FOR URBAN FOREST DEVELOPMENT & MANAGEMENT.

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VERTICAL FOREST ?

VERTICAL FOREST IS AN ANTI-SPRAWL MEASURE WHICH AIMS TO CONTROL AND REDUCE URBAN EXPANSION. A VERTICAL GARDEN IS A TECHNIQUE USED TO GROW PLANTS ON A VERTICALLY SUSPENDED PANEL BY USING HYDROPONICS., A PROJECT FOR METROPOLITAN REFORESTATION THAT CONTRIBUTES TO THE REGENERATION OF THE ENVIRONMENT AND URBAN BIODIVERSITY WITHOUT THE IMPLICATION OF EXPANDING THE CITY UPON THE TERRITORY.

NEED

- RAPID URBANIZATION.
- INCREASING DENSITIES AND REDUCTION.
- DECREASES IN URBAN OPEN SPACES.
- LOCALIZED CONCENTRATION OF POLLUTION.
- MORE ENERGY CONSUMPTION.
- LOSS OF AGRICULTURAL LAND.

Urban and rural population projected to 2050, World

HISTORY

THE FIRST VERTICAL GARDENS DATE BACK TO 3000 BCE IN THE MEDITERRANEAN AREA. GRAPE VINES (VITIS SPP.) WERE, AND CONTINUE TO BE, A VERY POPULAR FOOD CROP FOR PEOPLE IN THE REGION, SO THEY WERE COMMONLY GROWN IN FIELDS, HOMES, AND GARDENS THROUGHOUT THE AREA. ALTHOUGH VERTICAL GARDENING HAS EXISTED THROUGHOUT HISTORY, ITS MODERN-DAY POPULARITY BOOM DIDN'T BEGIN UNTIL THE 1980

CASE STUDIES

MILAN'S 'VERTICAL FORESTS'

COMPOSED OF TWO RESIDENTIAL TOWERS OF 110 AND 76 M HEIGHT, WAS REALIZED IN THE CENTRE OF MILAN, ON THE EDGE OF THE ISOLA NEIGHBOURHOOD, AND HOSTS 900 TREES (EACH MEASURING 3, 6 OR 9 METERS) AND OVER 2000 PLANTS FROM A WIDE RANGE OF SHRUBS AND FLORAL PLANTS DISTRIBUTED IN RELATION TO THE FACADE'S POSITION TOWARDS THE SUN.

ADVANCEMENT IN TECHNOLOGY

ROLE OF COMPUTER SCIENCE

THE VERTICAL DESIGN ALLOWS HIGHER DENSITY OF PLANTS IN A MUCH SMALLER FOOTPRINT. THE MICROCONTROLLER IS CONNECTED TO A WI-FI MODULE THAT SENSES DATA THROUGH SENSORS AND SENDS IT OVER A MOBILE APP.

Figure 3: Framework of panel monitoring using IoT module

IOT (INTERNET OF THINGS) SYSTEM KEEPS CONTINUOUS TRACK OF SOLAR POWER PLANT, THE DAILY WEEKLY AND MONTHLY ANALYSIS BECOMES EASY AND EFFICIENT ALSO WITH THE HELP OF THIS ANALYSIS IT IS POSSIBLE TO DETECT ANY FAULT OCCURRED WITHIN POWER PLANT AS THE GENERATED POWER MAY SHOW SOME INCONSISTENCY IN DATA OF SOLAR POWER PLANT.

BENEFITS

REFERENCES

- (N.D.). RETRIEVED FROM <https://greenroofsaustralia.com.au/living-walls-improving-air-quality-20111101>
- A REVIEW OF GREEN WALLS TECHNOLOGY BENEFITS AND DESIGN 2015 INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES AND RESEARCH TECHNOLOGY
- CARPENTER, S. (2014). A GUIDE TO GREEN ROOFS, WALLS AND FACADES. MELBOURNE AND VICTORIA.
- GREEN FACADES AS A NEW SUSTAINABLE APPROACH TOWARDS CLIMATIC CHANGE 2012 ELSEVIER
- GREEN WALL SYSTEMS: A REVIEW OF THEIR CHARACTERISTICS 2012 ELSEVIER
- HAGIDA, L., SHIVA, L. & MENDONÇA, P. (2017). GREEN WALLS AN EFFICIENT SOLUTION FOR HYGROTHERMAL, NOISE AND AIR POLLUTION CONTROL IN THE BUILDINGS. RESEARCHGATE.
- NAVIA, (2018, 03 12). RETRIEVED FROM <https://www.navia.io/news/science-backed-navia-green-wall-purifies-air-thscta/racking=78912aaa-819b-4d59-840c-7d666ae791ed%7c733c-6036-4445-4087-a767-1f9f5110ac8d>
- RAMIREZ, J. (N.D.). RETRIEVED FROM https://openlab.citytech.cuny.edu/buildingtech4/posts/files/2013/10/FALL_2013_RESEARCH-ASSIGNMENT_GREENWALLSYSTEMPHOTOVOTACISYSTEM.PDF
- SPROUT PEOPLE, (N.D.). RETRIEVED FROM <https://sproutpeople.org/hemp-felt-growing-medium-bulk/>
- THUR, O. B. & KARACA, E. (2013). VERTICAL GARDENS. INTERCHOPEN
- WIKIPEDIA, (N.D.). RETRIEVED FROM <https://en.m.wikipedia.org/wiki/Hydroponics>
- W.C.L. K.K.A (2014). A REVIEW ON GREEN ROOFS PERFORMANCE FROM ENVIRONMENTAL PERSPECTIVE. YEYUNG: INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCH TECHNOLOGY.
- SANKHA, F. GUNJAL, P. K. CHARLE, N.V. (2015). A COMPREHENSIVE STUDY OF GREEN WALLS TECHNOLOGY, BENEFITS AND DESIGN. PUNE: INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCH TECHNOLOGY

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