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GREEN ENVIRONMENT FARMING WITH THE USE OF RENEWABLE ENERGY SOURCES

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ABSTRACT—

*Energy is essential in everyone's part of life in various forms. It is the gift of the nature to mankind. The day-by-day usage of energy increases at a fast rate. Every year the demand of it is going up by 10%. If the rate increases by this ratio then we are going to face an energy crisis in the very near future. Because of the more usage of energy we are not in a position to produce it at the requiring level with the general conventional sources which are non-renewable. For that we have to use non-conventional energy sources which can be renewable. The energies from Solar radiation, wind, flowing water, rotating turbines, biomass.. etc. are all known as non-conventional energies. As these are all renewable energies we can use them further more number times which helps to produce the energy at the requiring level. Also all the non-conventional energy sources are available in nature and they are free & costs nothing .It is our responsibility to use them carefully. However Producing the energy is not only important but also we should have the clear information that how to manage it. At the same time it is also necessary to save energy by different techniques. The present paper describes about the use of non-conventional energy sources, their usage in the "**Vertical Farming**" method which is a very good farming technique over all the other techniques.This method involves how to grow high quantity of hygienic food products in less amount of space inside environmentally controlled multi-storied building even during un-seasonal periods/times.*

Keywords : hygienic food products , method involve , nature to mankind.

DESCRIPTION & ESSENTIAL NEEDS OF THE CONCEPT:

One of the most significant aspects of the current energy consumption pattern in many developing countries is that non-commercial sources such as firewood, animal dung and agricultural waste represent a significant 8% the total energy used in the world. By the year of 2050 nearly 80%of earth population will reside in urban centers. Applying the most conservative estimates to current demographic trends.The human population will increase about by 3 billion people during the interim. An estimated 10^9 hectares of new land will be needed to grow enough food to feed them. If the traditional farming practice continues as

like of this in just another 50years the next 3 billion people will surely go hungry. And the world will become a much more unpleasant place to live.

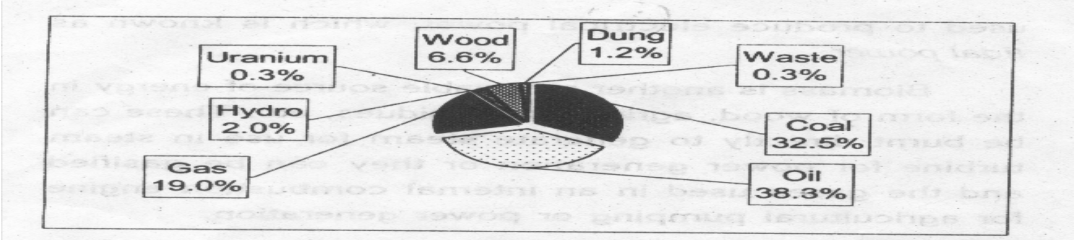


Figure (1) Pie diagram for the total energy consumption in the world

For this we have to choose a new farming method with the freely available and applicable energy sources as alternate energy sources.In the Vertical Farming method we are presented a small model of it in which we are explained how to produce the high quantity of quality food products by the Non-Conventional energy souces like solar energy,wind energy,thermal energy.Non-conventional energy sources also called Renewable energy sources that are continuously replenished by natural processes**.**

Various forms of Non-Conventional energies Used here are:

(a).Solar energy:

Solar energy is the most readily available and free source of energy since prehistoric times. It is estimated that solar energy equivalent to over 15,000 times the world's annual commercial energy consumption reaches the earth every year. India receives solar energy in the region of 5 to 7 kWh/m^2 for 300 to 330 days in a year. This energy is sufficient to set up 20 MW solar power plant per square kilometre land area.

SOME EXAMPLES OF USE OF SOLAR PANNELS

Agriculture Lightning purpose Heating Purpose

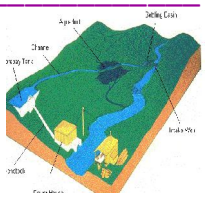
(b).Wind energy:

Wind energy uses the high wind velocity available in certain parts.The K.E of wind is converted in to electrical energyWind energy is used for pumping the water or power generation. About 0.7 million-wind pumps are in operation in different countries. A minimum wind speed of 3 m/s is needed.This is considered to have a high efficiency.
Coastal hilly and valley areas are suitable for this process.

(c).Bio energy:

Bio-Energy the main-source for production of it is wet cow dung orwet livestock (and even human) waste.

(d).Hydro energy:



Hydrogen energy is the cleanest form of energy.P.E of falling water captured and converted to mechanical energyHydroenergy can play an important role as an alternative to conventional fuels provided itstechnical problems of production,storage andtransportation can be resoled satisfactory.One of the most attractive features of hydrogen as an energy carrieris that it can be produce from water

.

CONSTRUCTION OF OUR VERTICAL FARMING MODEL WITH THESE NON-CONVENTIONAL ENERGY SOURCES (prototype):

The construction of the prototype is very simple made of wood.It resembles a small model of the imaginary vertical farming tower with 3-storied platform closed from 4 sides .Plants are grown/cultivated on these platforms .The top layer of it established with a pair of solar panels and prototype of wind-mill to fulfill the electricity needs of the tower and to draw the under ground water for watering the plants,also the main essential things installed for this model of farming.

*LED'S are also being installed to provide better scope for photo-synthesis even during dull day light and nights.

*A model of bio-gas plant is also installed to recycle the organic wastage that is produced during harvesting, cleaning the weeds e.t.c.,

*Hydroponics (a method of growing plants without soil) is also used in this because taking soil to cover such a large amount of area in the upper floors of this structure for growing crops might become little bit difficult.

*Drip irrigation method (to provide enough water drop by drop to the plant)is also used to reduce the un-necessary usage of water.

WORKING :

The constructed wooden model is closed on four sides. so that the plant can't receive the deserved amount of sunlight, which effects the photosynthesis process. In order to overcome this problem LED'S of different colours are used in every floor.Each colour of LED has its own characteristic wave length which is suitable for growth and yield of the plant.

OBSERVATION:

We conducted an simple experiment to observe the response of plants for different colours of LED'S. In this experiment we collected some kidney beans which are made to grow under LED'S instead of sunlight. They exhibited different kinds of properties for different colours of LED'S.

The observations are

1. blue: causes poor growth which shapes height & quality.
2. red(660 nm): make grow tall and thin…(if red is increased while IR diminished plants will be short but thick)
3. U.V: gives colour, taste and aroma….
4. green: this is the worst effect in the photosynthesis. the cholorophyll ejects green colour light.

POWER SUPPLY USING WIND MILLS & SOLAR PANELS:

The power required for the LED'S and other resources is drawn from solar panels & wind mills. Here the wind mills are auto procated and auto spinned wind mills. These are quite different from the normal wind mills. The normal wind mills requires 60 kmph wind velocity. But these wind mills start rotating and generate power even the wind blows with normal velocity.

USAGE OF ORGANIC WASTAGE OF PLANTS:

The organic wastage produced during and after the cultivation of the crops is used for the production of biogas, which in turns is used for generating electricity, and the remaining matter is used as a natural fertilizer for the crops.

DRIP IRRIGATION:

Now-a-days the water scarcity is the major problem being faced by the farmers. In traditional farming the water wastage is high, in order to over come this problem drip irrigation came into practise.In drip irrigation method the water is supplied to the plants drop by drop, which reduces the water wastage and increases the growth of the plants comparatively….

USING HYDROPONICS:

As discussed earlier real vertical farming towers contains multi storeys, so it is little bit difficult to carry and spread the soil at great heights and to change it after the harvest (after yielding of the crop, fertility of the soil decreases). So optionally we use hydroponics.In hydroponics method the salts and minerals that are essential for the growth of plants are dissolved in distilled water to the optimum amount. So that the plant can draw the minerals required from this hydroponic solution. the food products produced by this hydroponics method are hygine and contains high protein values.

THE CHEMICALS THAT ARE REQUIRED FOR THE PREPARATION OF HYDROPONIC SOLUTION ARE:

1.yara brand calcium nitrate.
2.magnesium sulphate heptahydrate.

3.potasium nitrate.
4.copper sulphate penta hydrate.
5.potassium mono basic phosphate .
6.sodium molybdate.
7.manganese sulphate mono hydrate.
8.boric acid

All these required chemicals are dissolved in distilled water at appropriate proportions to prepare an hydroponic solution.

ADVANTAGES OF THIS METHOD OF FARMING:

1. Year round crop production,1 indoor acre is equivalent to 4-6outdoor acres or more depending upon the crops.
(eg: strawberries@ 1 indoor acre =30outdoor acres)
2. No weather related crop failure due to droughts, floods & pests.
3 .All food products are grown organically……no use of pesticides ,germicides and fertilizers..
4. Vertical farming virtually eliminates agricultural run-off by re-cycling black water.
5. Vertical farming gradually reduces incidence of attack of infectious diseases that are acquired at the agricultural interface.
6. Vertical farming add energy back to the grid vice methane generation from composting non-edible parts of plants.
7. Vertical farming drastically reduces the use of fossil fuels.
(no tractors,no ploughs)
8. Creates sustainable environment to the urban centers.
9. Provides new employment opportunities.
10. Reduction in cost of food products.
11. No scope for agricultural inflation.
12. Reduces global warming.
13. provides profitable and reasonable rates for farmers.

REFS:

(1).Overview of power sector in india: www.indiacore.com
(2).Bureau of energy efficiency: www.em-ea.org.
(3)Natinal Green corporation in India: www.ngc.gov.in
(4).verticalfarm.com
(5).greeningfoil.com

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