



YOUNG SCIENTIST PROGRAM 2014-2015
SCIENTIFIC TALENT EVALUATION PROGRAM
AT
ANNAMMAL COLLEGE OF NURSING,
KUZHUTHURAI
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“Education is the most powerful weapon which you can use to change the world”.

-Nelson Mandela



The review for the final presentation of all the teams of KAP was held on 18th April, 2015 at Annammal College, Kuzhithurai. The programme started sharply around 8:30 a.m. In the introductory section Mr. Mullanchery M. Velaian, the organizer of Kumari Arival Peravai (KAP) said about the venue of the following meeting and the programs which are to be held at Central University of Tamil Nadu, Thiruvarur. He added that the birth place of Kalaignar Karunanidhi is Thiruvarur.

Followed by him Er. A. Benzigar Rajan, Dy. Manager, ISRO Propulsion Complex Mahendragiri initiated his speech. Nature has to be seen as science. We being human are doing inhuman activities that are destroying the planet Earth. Inhuman activities is the acts like cutting down trees which depletes the natural resources, polluting water bodies, air, and land by using harmful chemicals and non-degrading substances. These pollutants in turn deplete ozone layer making us prone to skin diseases due to dangerous UV rays from sun. Without ozone layer our atmospheric air will have a temperature around -33°C. The chemical representation of ozone is O₃. Chlorine is used in medical field to make a person unconscious during surgery. When chlorine combines with ozone it creates skin diseases and cancer which also depletes the ozone. Moreover if ozone is absent even flowers will not bloom. In India districts like Rajasthan and Orissa have coal seam. In Tamil Nadu Mannargudi and Neyveli are known for coal seams. Mannargudi coal project was neglected by Tamil Nadu government

because coal mining in that area would make the nearby water bodies saline. Thiruvapur is a fertile land and a delta region with river beds. Kerala has so many rivers but those are not known for delta. Even though Thiruvapur is a fertile land it is not a suitable place for acquiring minerals. He also said more points about Thanjavur. He said Kanyakumari district is the only district that had 33% of forest cover before rubber plantation. But now it has only 19% of forest cover.

After the talk of Er.A.Benzigar Rajan the programme started. Miss. S.Ayana Treasa Raj, member of Green team compeered the session. She said about the selfless activities of KAP and about the Annamal College. The meeting began with “Tamil Thai Vazhtu”. She welcomed all the dignitaries. First of all Mr. Velaian was welcomed to deliver his speech. He said Kanyakumari district students should achieve more in education. His words were encouraging. He also welcoming all the dignitaries who were invited for the meeting. The red team members honored their Resource Person Prof.T.Jayaselvakumari with a shawl. Then one of the General Consultants of Red team Shri.N.Sivasubramanian, Chief General Manager Rtd.ISRO Valiamala was welcomed to deliver his honorary speech. He talked about space communication vehicles and their contribution towards human interaction. He said about National Aeronautics and Space Administration (NASA) of USA. Then he said about the achievements of Indian Space Research Organization (ISRO) of India like successful launch of Mangalyaan, Chandrayaan and cryogenic propellants for satellite launch. He also quoted that “Failure is the stepping stone for success”. Thana is selected as a capital of Earth hour 2015 by World Wide Fund (WWF) for Nature. In India Coimbatore was selected as a capital of Earth hour 2014, he said. The reasons why Thana is selected as a capital of Earth hour 2015 by WWF are because Thana installed,

- Solar Water Heaters
- Hybrid Power Plants
- Bio-Methanisation Plants
- Recycling Switching

The Thana government installed the above mentioned technologies for energy sustainability for future. We should make every city a smart city. For this we should recycle wastes at least three times. We should control pollutions and crime issues. We should renew existing infrastructure and install sewage plants for making the environment pollution free. In addition he said March 14th of a year is celebrated as pie (π) day. Since $\pi = 3.14$, 3 represents the month and 14 represents the day. Then he said about the types of Moons namely Wolf Moon, Snow Moon, Worm Moon, Pink Moon, Flower Moon, Strawberry Moon, Buck Moon, Sturgeon moon, Beaver moon, Cold moon, Black Moon, Blue Moon, Wet Moon, New Moon, Super Moon, Hunters Moon/Harvest Moon and Blood Moon. He then said India is known for its ideas and America is famous for opportunities. Finally Miss. Gby Atee, leader of Green team said vote of thanks.

First of all Red team and its members started their presentation on **Land and forest** under Sustainable Environment. Sustainability means that “all our programs either have a positive effect on the natural environment and surrounding community or no impact at all on the natural environment”. “Development which meets the needs of the present without compromising the ability of future

generations to meet their own needs is sustainable development". Land is the area covered by natural resources excluding water. It is in the form of forests, pastures, farming, human settlements, industries etc. All types of organisms including man are born, flourish, mature and at last meet their end on land. People give respect to land as mother. People have fought wars over land. But when land is treated in a reckless way it leads to degradation. The special features of land include; free gift of nature, limited in area, permanent, lacks mobility and land is of infinite variety.

Land differs by fertility and location. Land and soil is not the same thing. Part of the world that is not covered by oceans or water is land. Soil is the layer of material that covers the land. It takes thousands of years for soil to form from rocks. It takes hundreds of years for rich organic matter to build up in it. Our land is home to many unique plants and animals. Making the best use of our land and soils is very important for our well being and survival. Earth has total land cover of 148,939,063.133 km² i.e., (29.2% surface, 70.8% water). India has total land over of 1,847,454 square miles. Three types of land in India are Mountains of 29%, Plateaus of 28%, and Plains of 43%. Then she said about Types of Lands namely,

- Forest Lands :
 - 2% of worlds total forest. 16% of population, 13% of cattle. Biotic pressure.
- Pastures and Grazing Lands:
 - 4% in India. Present in hilly areas. Agriculture. Needs eight month rain. Himachal Pradesh has the max.
- Farm Lands:
 - 55% of total land area is used for growing crops.45% crops grown out of total 55%.
- Land under human settlement :
 - 19%. In 1981 the census was 3,949 towns, 557, 137 villages. 48,087 no settlement.

Population increases so land becomes a scarce resource. This plan is to mitigate the negative effects. It is a systematic assessment. The main principle of this planning is to allocate land uses according to the needs of people in future. The change in the characteristics & quality of soil leads to loss of natural fertility & productivity which can be defined as land degradation. 5-7m ha of land degrades annually. Over 96 million km² to 200 million km² area has been affected by human-induced soil degradation. 15.6% is strongly degraded, 51.7 % moderately degraded. Soil erosion is due to removal of trees. Soil salinity is caused when trees are cut down and water table rise up bringing salt from rocks deep under with absence of rain. These are the major form of land degradation. The causes of land degradation are; agricultural depletion, urbanization & urban commercial development, population growth, industrialization & infrastructure development, increasing income, modern agriculture practices, pollution & climate change and food prices.

Land contamination and pollution is due to the damage caused to land by human activities. Main pollutants are plastic and xenobiotic (human made chemicals). The major causes of land contamination are; accidental spills, acid rain, intensive farming, deforestation, genetically modified plants, nuclear wastes and mining. Agricultural practices, such as application of pesticides, herbicides

& fertilizers lead to degradation and contamination. About 80% of the trash goes to landfills, 10% is burned, and 10% is recycled.

Some preventive measures are planting trees, terrace farming, organic farming, proper garbage disposal, recycle garbage, reduce use of herbicides and pesticides, avoid over packaged items and efficient utilization of resources and reducing wastage. The process of protecting natural land and returning developed land to its natural state is land conservation. Preservation means maintenance of land. Restoration means restoring an ecosystem. Remediation means cleaning a contaminated area using nondestructive methods. Mitigation means process of replacing a degraded site.

Cropland means farm land that forms 1.8 billion hectare worldwide. Of these 38% farm land are affected. Irrigated land has a total area of 252 million hectare. Of these 20% irrigated land are affected. The challenges in sustainability are like overuse of water resources, soil erosion, sanitization, over grazing and so on. To meet the global food demand 6 million hectare of new farmland is needed every year. Land is in short supply and conflicts occur. Land management means managing the use and development of land resources. Management measures include; maintaining long term productivity of the ecosystem functions and increasing productivity- Quality and quantity. Terrace farming is the method of farms in hilly areas.

Today the world belongs to humans. They build cities, force the animals to leave. Cities become dirty, populated & polluted. 50% of the world's population now lives in cities and urban areas. It is here that the cleanest and most efficient energy, transportation and building infrastructure is possible. A green city is made up of buildings that are energy efficient, conserve water, and reduce waste. It preserves greenery and restores wetlands and harvest water. The availability of Agricultural Land about 6.17 ha per capita is dwindled to a meager 0.1% ha per capita by the year 2075. India's arable land area of 159.7 million hectares (394.6 million acres) is the second largest in the world, after the United States. Its gross irrigated crop area of 82.6 million hectares (215.6 m acres) is the largest in the world. In the fiscal year ending June 2011, Indian agriculture produced record production of 85.9 million tons of wheat, a 6.3 % increase from a year earlier. India largest producer of dairy products in the world but, 237.7 million children were affected by malnutrition. Above 50% of people are not even secure of single meal per day.

Forest is a Large area covered with trees, includes all other living and non-living things. It is an important source for peoples' demands & needs. It is the Lungs of the earth. It provides 5000 products for 23 million dollars supports 1.3 million people. 80% homes are established in/by forests. It is the Nature's water factories. More than half of anti cancer drugs are from forests. Now world forest cover is 4,150 million ha. In that 2850 million ha is closed & 1,285 ha open forest. 11 million ha of forest are being cleared every year throughout the world. 71% of the animals live in forests. Every year 18m acres, of forests are burned & destroyed every minute. Minimum 140 plant and animal species are condemned to extinct each day. For every plant extinct, up to 30 dependant animals and insects die. 1% of forest, is lost due to forest fire every year. 3% of forest area is affected by insects and disease. India ranks 10th in the list of most forested nations. Sunderban have lost 3.71% of mangrove forests between

2003 and 2014. Deforestation accounts for about 11% of global greenhouse gas emissions. Clearing of forests contributes 90-180 billion tons of CO₂. Green trees on the earth mop up CO₂ but if they are cut down and burnt, that increases 1.5 billion tons of gas per annum.

Forest functions as Water shed i.e., Surface run off, soil erosion & prevent drought. Also it regulates atmospheric conditions. They can act as “carbon sinks” and absorb CO₂ from the air. Land bank maintains soil nutrients & structure. Local use is for Food, fodder, fuel, timber, medicines etc. Market use is for wood & non wood products. Direct use is for Fruits, timber, gum, fiber etc. Indirect use is of Building material, raw materials for industries, paper, etc. The “services” which forests provide are incomparable; nothing can be substituted for them especially pollination.

Deforestation means exploiting or cutting down forest trees and fulfilling our needs. The causes of deforestation are; logging & agricultural activities, urbanization, hydroelectric dams, forest fires, desertification of land, mining for uses like bio fuel and cattle ranching, fire wood collection. Its effects include; climate imbalance, increase in global warming, carbon emissions, soil erosion, life quality, floods, water cycle and loss of species. Many methods are used for cutting trees that maintain sustainability. Clear cutting means cutting trees based on their age group. Selective cutting means cutting trees based on their maturity. Shelter wood cutting means cutting trees based on their uses. Regulated and Planned Cutting of trees means cutting trees below 1600 million cubic meters of wood land. It also controls over forest fire. Protection and proper utilization of forest can also be handled. National parks also help protect forest land.

Asia has 60% of population but has 13.7% total forest cover in the world. India and China has only 20% of forest. Forest cover of India is 19.27% of the geographic area. At present 12% of the total forest land of India is adequately covered with trees. Only 38 million ha of forests are well stocked. 1.3 million ha forest cover is being lost every year. According to Ministry of Environment and Forest, nearly 110,000 hectares of forest in India have been lost to mining activities in three decades.

The ground on which we stand is sacred. It is the blood of our ancestors. The greatest threat to our planet is the belief that someone else will save it. Our land and forest are more valuable than money. As long as the sun shines and the water flows, this land & forest will be here to give life. So, God sleeps in minerals, awakens in plants, walks in animals and thinks in man. But, we abuse land because we regard it as a commodity belonging to us. When we see as a community to which we belong, we may begin to use it with love and respect. Beautiful earth is turning into a defaced, ugly surface of land. We cut her hair where it should not be cut. Rip up her skin where it should not be ripped up. We drill holes inside her and suck all of her blood out. Put things inside of her and blow her bones up. Let us put our hands together and conserve land and forest resources, and let us make our earth a happy abode to live in not only for us, but also for the future generations to come in. Saying they concluded. Thus the entire Red team completed their presentation on “Land and Forest” under Sustainable Environment.

After the presentation of Red team, the Yellow team presented their presentation. Their topic was 'WATER'. Water covers over 71% of the Earth's surface. It is necessary for all forms of life. The availability and quality of water always have played an important part in determining not only where people can live, but also their quality of life. Only 1% of the world's water is usable to us. About 97% of water is salty sea water, and 2% is frozen in glaciers and polar icescapes. Less than 0.3% of all freshwater is in rivers, lakes and lagoons. Water is the only substance on Earth that is in liquid form at the temperatures commonly found on the Surface of our planet. Water is used in industries for processing, cleaning, dilution, and cooling in manufacturing facilities. Water is used for irrigating and as for residential purpose

The chemical name of water is Hydrogen dioxide (H_2O). Water is a combination of three nuclei and eight electrons. These nuclei and electrons have special properties. These special properties of water make it distinctive among fifteen million chemical species in the world. Then she explained the Molecule of water. The molecule of water contains 3 components, namely two molecules of hydrogen and one molecule of oxygen. A molecule is a combination of atomic nuclei and electrons. In water, each hydrogen nucleus is bound to the central oxygen atom by a pair of electrons that are shared between them. This pair of electrons is called covalent chemical bond. Each oxygen molecule consists of six electrons in its outer shell. Of these only have two outer shell electrons are used to create covalent chemical bond. The other four electron pairs surrounding the oxygen arrange themselves as far from each other as possible. This arranges H_2O into a shape of tetrahedral in which the angle between the electron pairs is 109.5° . But still the hydrogen atoms has more repulsive force against each other, the shape of H_2O changes from tetrahedral to distorted tetrahedral shape. Thus the angle between the two hydrogen atoms changes to 104.5° .

An Aquatic Ecosystem is an ecosystem in a body of water. It refers to entities with plants and animals relying on a watery environment. They can be rivers, streams, swamps, lakes, estuaries, marine systems and underground aquifers. The two main types of aquatic ecosystems are; Marine Ecosystem and Freshwater Ecosystem. Marine ecosystem covers 71 percent of the earth's surface. Different habitats ranging from Coral reefs to Estuaries make up this largest aquatic ecosystem in the planet. The Prime examples of marine ecosystem include; Ocean, Intertidal zones, Estuaries and Coral reefs Common species found in Marine ecosystem include; Marine mammals such as Seals, Whales. Manatees, Different species of Fish including Mackerel, Flounder, Dogfish etc and Organisms such as tiny planktons, Brown algae corals etc.

Fresh water ecosystem covers only 0.8 % of the Earth's surface. The water in freshwater ecosystems is non-saline. Approximately 41 percent of the Earth's fishes are found in freshwater ecosystem. Examples of freshwater ecosystems are; Streams, Lakes, Ponds and Wetlands There are three types of freshwater ecosystem; *Lentic*: slow moving water, including pools and ponds, *Lotic*: faster moving water, for example streams and rivers and *Wetlands*: areas where the soil is saturated for a least part of a zone.

Plant life that grows in and around a pond ranges from single cell algae called Phytoplankton, to large woody trees. Plants are vital to the functioning of ponds. Plants that grow along the ponds help reduce soil erosion, capture air pollutants before they can enter the water, stabilize sediments and take up excess nutrients. Tiny animals in the water called zooplanktons use Phytoplankton as a good resource. These plants can sometimes affect the birds that are found near the pond. The wildlife present in the pond can range from amphibians to migrating birds. Common wild life species that are found near the ponds are: Raccoons, Birds, Turtles, Snakes and Salamanders.

The availability of water spread all over the globe is defined as global water scenario. 96.5% of the global water supply is found in oceans, which are saline. 0.9% is salty water is located in saline lakes (e.g., the Caspian Sea). Remaining 2.5% of global water is fresh water which is used for domestic, industrial and agricultural purpose. Nearly 69% of the total fresh water supply is in the form of glaciers and ice caps. Fresh water is also found beneath the Earth's surface as ground water. 1.2% of freshwater is found as surface water storages such as lakes, streams, swamps and marshes. Saying thus she concluded.

Every day an increasing amount of pollution seeps into rivers and lakes making them toxic to humans. Underground aquifers, our most significant source of water are being depleted at an alarming rate. By 2050 the number of people on the planet is projected to exceed 9 billion, and if current trends continue more and more useable water will be lost. Making an adequate supply of water available to everyone alive today is a monumental task, and ensuring that there is enough water for all future generations will require an unprecedented level of international assistance.

Water the essential ingredient for life on this planet is becoming an increasingly inadequate resource. 97 million Indians lack access to safe water today. As a result, 21% of communicable diseases in India are related to unsafe water. India's water crisis is rooted in three causes. The first is insufficient water per person as a result of population growth. The total amount of usable water has been estimated to be between 700 to 1,200 billion cubic meters. The tribulations due to water crisis included; health, hunger, education and poverty.

Water crisis is demoralizing to human health. In many developing countries, people are forced to drink low quality water from flowing streams. All these sources are contaminated. There are many water-borne diseases that people die of because of drinking low quality polluted water. Hunger takes a lot of water to grow food and care for animals. Experts say that globally we use 70% of our water sources for agriculture and irrigation, and only 10% on domestic uses. Less water means farming with lower yield. In education, many children have to be up at dawn to collect water for the family. They have to walk for several miles to get water. The children get tired and some have to miss their schools as a result. In some places female children are not allowed to go to school at all, so that they can serve the family by getting water and taking care of other family needs. In such a way the education of the child.

In poverty, Access to quality water plays a key to economic prosperity and better living standards. Businesses and schools flourish when people come to work on time rather than spending all

mornings in the search of water. Restaurants, hotels and shopping places need to be kept clean to attract tourists and foreign investments. Manufacturing activities, commercial farms, and mining processes all need a lot of water to flourish. Lack of water means no economic activities will happen and the people will be in constant poverty.

Moving toward sustainable water systems included water abstraction, water treatment, water distribution network, drinking water supply, sanitation and preventing water wastage. The system includes;

- The geographic area that collects the water.
- A raw water collection point where the water is collected.
- Water purification facilities. Treated water is transferred using water pipes.
- Water storage facilities such as reservoirs.
- A pipe network for distribution of water to the consumers

Sustainable Water System is a system that consists of the ways of providing water and water facilities to the society for human consumption through pipes or through other means of water systems from the sustainable water resources such as rivers, ponds, lakes and lagoons. The pipeline system of a municipal water distribution network consists of arterial water mains or primary feeders, which convey water from the treatment plant to areas of major water use in the community. Many kinds of pumps are used in distribution systems. Shallow dams and reservoirs are susceptible to outbreaks of toxic algae, especially if the water is warmed by a hot sun.

Water pollution results due to the contamination of water by human activities. These make changes in the physical, chemical and biological nature of water. Over 70% of world's water is polluted. Water source has been improved from 1990 at 72% to 2008 at 88%. Also Sanitation has been improved from 1% in 1980 to 21% in 2008. 69% Indians lack improved sanitation facilities. Water scarcity can be determined as both the availability of water and its consumption patterns. There are several factors that influence the availability and consumption of water. Because of these factors water scarcity will vary widely from country to country and from region to region within a country. Over 90% water needs are served by inter-state rivers. Therefore conflicts arise between states. Agriculture requires more water in Tamil Nadu. Therefore most farmers rely on rainfall.

One of the most obvious effects of climate change has been melting of masses of ice around the world. Glaciers and ice sheets are large, slow-moving assemblages of ice that cover about 10% of the world's land area and exist on every continent except Australia. They are the world's largest reservoir of fresh water, holding approximately 75%. Over the past century, most of the world's mountain glaciers and the ice sheets in both Greenland and Antarctica have lost mass. Retreat of this ice occurs when the mass balance is negative such that more ice melts each year than is replaced. By affecting the temperature and precipitation of a particular area, both of which are key factors in the ability of a glacier to replenish its volume of ice, climate change affects the mass balance of glaciers and ice

sheets. When the temperature exceeds a particular level or warm temperatures last for a long enough period, and/or there is insufficient precipitation, glaciers and ice sheets will lose mass. Drought is caused not only by the lack of rainfall and high temperatures but by overuse and overpopulation. As temperatures rise and rainfall decreases, water quality can be devastated. During drought, drinking water supplies are easily prone to harmful algal blooms and other microorganisms. The water supply and quality affected by drought is about 25%. The Plants and wildlife affected by drought is about 14%. The Agriculture affected by drought is about 11%. And the business and industry affected by drought is about 9%. Flood is an overflow of water that submerges the lands or the areas that are normally dry. Over years, floods used to happen only once in 100 years. But now they have become very common. We can prevent it by;

- Better monitor and measure water supply and uses nationwide.
- Reduce indoor water use through more efficient appliances, technologies, and behaviors.
- Reduce outdoor water efficiency through drought-tolerant landscape design and improved irrigation technologies.
- Increase recycling and reuse of water, including capturing and reusing storm water, grey water, and wastewater.
- Make more strategic use of groundwater.

As demand for water exceeds a limit, conflicts raise between nations that share boundary of freshwater reserves. World has around 3% of fresh water resources. These fresh waters are not distributed evenly all around the earth. Some places have plenty of water. Some areas strive for water. Moreover water is not a stable matter. Because of the unstableness of water and unavailability of water, conflicts arise among people. There is a conflict between India and Pakistan and India and China for water in Asia. Water conflict arises also between African and also in Middle East. In India it is Cauvery River water dispute Krishna Water Disputes Tribunal and Indian Rivers Inter-link.

A green building is a structure that is environmentally responsible and resource-efficient throughout its life-cycle. These objectives expand and complement the classical building design concerns of economy, utility, durability, and comfort. Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by; efficiently using energy, water, and other resources, protecting occupant health and improving employee productivity and reducing waste, pollution and environment degradation. The US Green Building Council's LEED Green Building Rating System offers environmentally sound building strategies for achieving LEED certification as a green building. LEED Certification ensures that state-of-the-art conservation and environmentally sustainable techniques have been incorporated into the building's design and construction. LEED's Green Building Rating System integrates sound building practices in five categories: building site selection, energy efficiency, indoor environmental quality, building material choices and water efficiency.

Freshwater is a scarce resource; its annual availability is limited and demand is growing. The water footprint of humanity has exceeded sustainable levels at several places and is unequally

distributed among people. There are many spots in the world where serious water depletion or pollution takes place: rivers running dry, dropping lake and groundwater levels and endangered species because of contaminated water. The Water footprint components are; Green water footprint- volume of rainwater evaporated or incorporated into product, Blue water footprint- volume of surface or groundwater evaporated or incorporated into product and Grey water footprint- volume of polluted water.

Water stewardship is defined as the use of water that is socially equitable, environmentally sustainable and economically beneficial, achieved through a stakeholder. It is an inclusive process that involves site and catchment based actions. Out of 9.25 million trillion gallons of water on Earth, there is less than 1% of water available to meet the needs of nearly 7 billion people. Increase in population, urbanization, climate change and many more are pressurizing the water. Preserving the available water resources and effectively managing them is the most important duty of us. It includes the following; steps to better water stewardship, water awareness, knowledge of impact, internal action, collective action, wastewater processing, nanotechnology in filtration and technological innovations.

The Steps to better water stewardship were the journey of water stewardship involves learning, analyzing, implementing and improving. These are the steps that can be taken in the journey of water stewardship. Then Water awareness, the first most important and simple way is to create awareness. The impacts of business on water and impacts of water on business must be clear. Awareness also should explore how a company is perceived by others like its stakeholder i.e. the people interested in business, consumers and the press. The awareness can be even internal that creates awareness within a business group, involved in the activity of a business. This would create awareness about global water challenges and also creates an exposure to water related risks. Next Knowledge of impact, this refers to a wider understanding of the impacts of the business on the environment in all terms. This includes measuring elements of water and an estimate impact on water by the business. They analyze the risk and understand the impacts which would help in overcoming the issues. Then Internal action, in this step the actions like sorting the ones with more priority, learning, targeting, planning and coming up with solutions to tackle problems are taken. The launch of projects is also undertaken in this stage like improvement of water quality, launch of water efficiency projects, pollution prevention and many more. After that Collective action, in this step the company realizes the need for working in groups to maintain a healthy water stewardship. The company gets associated with local water groups, stakeholders and many other organizations which will help them mitigate the water related problems and have a control over water issues.

People should avoid water crisis only then we could flourish future generation. Or else our future generation could have to use desalinated water & contaminated water. As a result all living beings become extinct. So we have to creating awareness to the public to respect nature & allow it to grow. We should use resources sustainably so that we could sustain human development. Consequently we would get continual supply of water, materials and resources and so we could protect human health. The earth's water is limited, and many aquifers around the world are going dry and threatens human which wildlife survival. Fresh water is also necessary to agriculture, which feeds most of the people on

the planet. Water is essential to all life, and we need to do everything we can to conserve and preserve it. By saying all such definitions, facts and issues about water she concluded the Yellow teams' presentation.

After the presentation of Yellow team the Maroon team started its presentation on the topic **SUSTAINABLE AGRICULTURE**. Agriculture is the cultivation of animals, plants, fungi and other life forms to sustain human life. 'The discovery of agriculture was the first big step towards a civilized life'. Agriculture is the wisest pursuit because it contributes to the real wealth. She said that agriculture is the main occupation in India. Two-third of population is dependent on agriculture directly or indirectly. It is not merely a source of livelihood. It is the main source of food, fodder and fuel. It is the basic foundation of economic development. Agriculture provides highest contribution to national income. The significance of agriculture that includes: contribution to national income, main source of food, agriculture and industrial development, source of foreign trade, international importance, way of life, effect on prices and economic development. Sustainability is important to make sure that we have and will continue to have the water, materials and resources to protect human health and our environment which will sustain agriculture.

The word sustainable comes from the word sustain. The word sustain, in the Latin means to keep in existence or maintain and implies long-term support or permanence. As it pertains to agriculture, sustainable describes farming systems that are capable of maintaining their productivity and usefulness to society indefinitely. Sustainable agriculture can improve the fertility of the soil. Sustainable agriculture can fulfill all the human needs. Sustainable agriculture can promote organic fertilizers. Sustainable agriculture is a Key source of income. Sustainable agriculture preserves the quality of natural resources. Sustainable agriculture is a type of agriculture that focuses on producing crops and livestock while having minimal effects on the environment. This type of agriculture finds a good balance between the need for food production and the preservation of the ecological system within the environment. In addition to producing food, there are several overall goals associated with sustainable agriculture, including conserving water, reducing use of fertilizers and pesticides, and promoting biodiversity in crops grown and the ecosystem. Sustainable agriculture also focuses on maintaining the economic stability of farms and helping farmers improve their techniques and quality of life.

Improper balance of Agriculture is leading to various problems. The usage of pesticides, insecticides and herbicides instead of natural fertilizers these days to increase food production and to enjoy higher profit are the major reasons for agricultural imbalance, health problems and environmental problems. So Sustainable Agriculture is awfully needed for the betterment of the economy, environment and society. For environmental need the special type of agriculture and farming technique, Sustainable Agriculture, makes utmost use of the environment and that too without causing any harm to the environment. For human need at present, agriculture should feed a population of 6.4 billion but produces only 22 trillion calories annually, sufficient for only 5 billion people. The growing population should be fed. In future growth in food production will largely depend on finding ways to increase the productivity of existing agriculture. For economical need as an economy develops and diversifies, the

primary agricultural sector loses weight in terms of GDP but develops strong linkages with the rest of the economy. Agriculture supports and promotes the development of rural areas and hence the quality of rural life.

In the past for the preparation of land instruments like spade, hoe, and rake and plough and bullock are used. Sowing was divided into 2 such as; sowing in rows and Sowing in holes. Fertilizers such as animals litter etc... were used. Then she mentioned some of the farming methods which were used here such as; *Chinampa Farming System*- Chinampa system farming (sometimes called floating gardens) is a form of ancient farming method raised to grow crops on the shallow lake beds. These are artificial islands created by staking out the shallow lake bed and then fencing in the rectangle with wattle. The fenced-off area was then layered with mud, lake sediment, and decaying vegetation, eventually bringing it above the level of the lake. These islands had very high crop yields. *Vertical Cropping, Green House Farming and Inter-cropping.*

Crop rotation is a systematic approach and is the practice of growing a series of dissimilar types of crops in the same area in sequential seasons. Crop rotation gives various nutrients to the soil. A traditional element of crop rotation is the replenishment of nitrogen through the use of green manure in sequence with cereals and other crops. The practice of crop rotation helps getting a good soil structure and high organic matter, resulting in higher yield. Fertilizer provides plants with all sorts of nutrients that they need to grow strong and healthy, including, most importantly, nitrogen, phosphorus, and potassium. That's why farmers all over the world, in countries rich and poor, put manure on their crops.

Modern agricultural practices focus on doubling food production with the usage of fertilizers such as Inorganic fertilizers, Liquid fertilizers, Fertilizers with pesticide and Organic fertilizers. It encourages genetically modified crops. Some of the modern methods include; Vertical Farming, Organic Farming, Crop Rotation and Multi-crop farming. More than 90% of farmer's today work using the most innovative practices and growing techniques to produce enough food, fuel and fiber for a growing world. Modern agriculture techniques and tools rely on the most innovative science to maintain a careful balance of farm inputs that optimize crop production while lessening potential impacts on the environment. Techniques such as conservation tillage, integrated pest management and crop rotation focus sustainability without sacrificing crop yields.

Some of the innovations to manage food and water properly include; crop protection, heat tolerance, integrated soil fertility management, nitrogen use efficiency, organic agriculture, precision agriculture, sprinkler irrigation, water harvesting, drip irrigation and drought tolerance. Then they described about the five innovations in farming namely; Dairy Hubs, Fertilizer Deep Placement, High roofed greenhouses, New feeding system and Farm Management Software And Training.

Then she said the fertilizer is placed 7-10 centimeters below the soil, which allows less nitrogen to be lost through runoff. Greenhouses are a great way to increase production, although a traditional greenhouse can only grow short tomato and cucumber plants. A new way of feeding farm animals, which involves weighing and blending all foodstuff into a complete ration, makes sure all an animals'

nutrient requirements are met. The difference between ancient & modern agriculture include; *ancient farming*- it was done by farmers, used only natural urea, the yield was less, used more quality crops and used more labor force, *modern farming*- it was done by machines, used chemical pesticides, the yield was more, used less quality crops and less labor force. Some of the ancient methods which will conserve more amount of water are; check basin irrigation, furrow irrigation and basin irrigation

Basin Irrigation method is more suited for horticulture development. In this method, a raised platform is formed around trees or bushes and they are connected with each other through drains and the water reaches from one tree to the other. Furrow irrigation method is resorted to where crops are grown in rows. The quantity of flow of water depends on demand of water by plants and the rate of infiltration. In strip irrigation method, fields are divided into strips of different size. A boundary is formed to separate the strips. These strips are constructed according to the slope. In Check Basin method of irrigation, the whole field is divided into basins according to the capacity of water. Basins are connected through a small drain type flow way, which has raised earthen walls on both sides. These basins are surrounded by small furrows. Some of the modern methods which conserve more amount of water are; drip irrigation and sprinkler irrigation. Sprinkler irrigation method sprinkles water to all the crops in a less amount at regular intervals. Drip irrigation water is applied at frequent intervals in the form of water droplets through perforations in plastic pipes or through nozzles attached to tubes spread over the soil to irrigate a limited area around the plant. Pot irrigation method is more suitable for areas having scanty rainfall. In saline areas where flow irrigation is not suited, pot irrigation method is successful. An earthen pitcher is used in this method.

Soil erosion from farmland threatens the productivity of agricultural fields and causes infertility of the soil. Land degradation caused by soil erosion harms the sustainability of agriculture. Sustainability in a way is a linked to management also. Chemicals are added to the land to stop the growing of weeds. The weeds itself can be used as manure. The use of insecticides and pesticides in the farms are against the angels of agriculture, honey bees. The yellow black buzzers are essential for crop production, pollinating up to 80% of plants and flowers essential to the human diet. Earth worms, farmer's friend, are in danger due to the addition of artificial fertilizers as these fertilizers are salts. The wastes from the earth worm have all the essential nutrients for plant growth. Fertilizers are introduced into groundwater through recharge of contaminated run-off. During soil erosion eroded soil clogs streams, rivers, lakes, and reservoirs, resulting in increased flooding, decreased reservoir capacity, and destruction of habitats for many species of fish and other aquatic life. The eroded soils contain nutrients and other chemicals that are beneficial on farm fields but can impair water quality when carried away by erosion. The remedies for bringing sustainability in agriculture are; eliminate waste, encourage diversity within the farm and encourage diversity surrounding the farm by planting more trees.

The Earth's staggering biodiversity is also responsible for more tangible human goods. In many parts of the world, plants are the main source of medicine used for primary health care, linking the survival of plant diversity with human well-being. Farmers rely on services provided by ecosystems to produce the foods we eat every day, and the health of ecosystems, in turn, are dependent on biodiversity. Sustainable agriculture can be understood as an ecosystem approach to agriculture. The most important factors for an individual site are sun, air, soil, nutrients, and water. Of the five, water

and soil quality and quantity are most amenable to human intervention through time and labor. Although air and sunlight are available everywhere on Earth, crops also depend on soil nutrients and the availability of water. When farmers grow and harvest crops, they remove some of these nutrients from the soil.

Some of the sustainable agricultural practices include; Management planning- growing domestic animals such as cattle's which are benefit to our farm, Plant production practices, National Mission on Micro Irrigation and Making use of Renewable Energy Sources. Agriculture has changed dramatically, especially since the end of World War II. Food and fiber productivity soared due to new technologies, mechanization, increased chemical use, specialization and government policies that favored maximizing production. These changes have had many positive effects and reduced many risks in farming. Prominent among these are topsoil depletion, groundwater contamination, the decline of family farms, continued neglect of the living and working conditions for farm laborers, increasing costs of production, and the disintegration of economic and social conditions in rural communities. The most important issues related to water quality involve sanitation and contamination of ground and surface waters by pesticides, nitrates and selenium. Salinity has become a problem wherever water of even relatively low salt content is used on shallow soils in arid regions and/or where the water table is near the root zone of crops.

Green revolution was introduced by Dr. Norman Borlaugh who was also considered as father of Green Revolution. Its aim is to produce high crop yields. The Green Revolution is the recent trend in crop production of using fertilizers, pesticides, and machines to produce high crop yields. The Green Revolution was a period when the productivity of global agriculture increased drastically as a result of new advances. During this period, new chemical fertilizers and synthetic herbicides and pesticides were created. The chemical fertilizers made it possible to supply crops with extra nutrients and, therefore, increase yield. Multiple cropping is when a field is used to grow two or more crops throughout the year, so that the field constantly has something growing on it. These new farming techniques intensified as a result of the Green Revolution.

Some of the sustainable initiatives by India include schemes like; Rashtriya Krishi Vikas Yojana, National Food Security Mission (NFSM), National Horticulture Mission, National Mission on micro irrigation, National Project on Organic Farming (NPOF), public distribution system and Targeted public distribution system. A sustainable initiative in agriculture is defined as a launch of Policies, Missions, and Schemes by government that helps the farmers to meet their needs and to improve the quality of agricultural products. The various technical measures employed to develop agriculture are as under Multiple Cropping, Use of High Yielding Variety (HYV) Seeds, Expansion of Irrigation Facilities, Plant Protection, Use of Mechanization, Use of Chemical Fertilizers, Development of Agricultural Land, Animal Husbandry and Land reforms.

Government of India has built up food security system in the form of "Public Distribution System" (PDS) during the planning period. The amended form of PDS is known as TPDS. The Government has updated the plans in PDS by issuing special cards to people below poverty line (BPL)

and selling essential articles under PDS to them at specially subsidized prices. Under TPDS each poor family is entitled to 10 kg of food grains per month at specially subsidized prices. We should Use efficient techniques and make the agriculture in a form of sustainable one.

After the presentation of Maroon team the students of Green team started their presentation on “**Sustainable Energy**”. Energy consumption is the consumption of energy or power. We consume energy as part of our daily lives. We use energy to create electricity to run our lights. We use energy to heat our homes and we use it for everything. As a nation, we consume a lot of energy. Saying thus she concluded her talk. Consumption and production of energy from resources has several issues like pollution of land, air and water, depletion of ozone, acid rain, fine particulates and so on. Renewable energy is generally defined as energy that comes from resources which are naturally replenished on a human timescale such as solar, wind, rain, tides, waves and geothermal heat. Fossil fuel is a term for buried combustible geologic deposits of organic materials, formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust over hundreds of millions of years. Sustainable energy is the form of energy obtained from non-exhaustible resources, such that the provision of this form of energy serves the needs of the present without compromising the ability of future generations to meet their needs.

Whenever we save energy, we not only save money but we also reduce the demand for fossil fuels such as coal, oil, and natural gas. Less burning of fossil fuels also means lower emissions of carbon dioxide (CO₂), the primary contributor to global warming, and other pollutants. All our activities must conserve energy that is we have to maximize energy conservation by minimizing energy consumption. This can be the key too sustainable environment and sustainable future. Energy efficiency is the goal to reduce the amount of energy required to provide products and services. For example, insulating a home allows a building to use less heating and cooling energy to achieve and maintain a comfortable temperature. Installing fluorescent lights or natural skylights reduces the amount of energy required to attain the same level of illumination compared with using traditional incandescent light bulbs.

If energy use grows too rapidly, renewable energy development will chase a receding target. Energy efficiency and renewable energy are said to be the “twin pillars” of a sustainable energy policy. Both strategies must be developed concurrently in order to stabilize and reduce carbon dioxide emissions. Efficient energy use is essential to slowing the energy demand growth so that rising clean energy supplies can make deep cuts in fossil fuel use. Some of the alternate energies sources for transportation sector include; new fuels basically hydrogen vehicles, battery electric vehicle and hybrid vehicle as all use fuels that are sustainable. Energy Sources for a More Sustainable Future are; solar, hydro, wind, geothermal, biomass, tidal and so on. Technologies that promote sustainable energy include renewable energy sources, such as hydroelectricity, solar energy, wind energy, wave power, geothermal energy, bioenergy, tidal power and also technologies designed to improve energy efficiency.

India has emerged as a leader in promoting renewable energy development and tackling global climate change. The World watch Institute has worked closely with partners in India to advance the country's ambitious goals of increasing access to clean energy sources. Finally they concluded by saying that to let the future sustain our dependence on non-renewable sources like fossil fuels must be reduced and we have to switch to renewable sustainable energy sources.

After the presentation of Green team the presentation of Blue team began on the theme Technology. Technology plays a major role in present world and in every part of our life. It impacts all our day-to-day activities. Understanding technology for a sustainable environment is essential nowadays. Technology is the application of scientific knowledge for practical purpose. It is a science of putting inventions and discoveries into practical use. Technological systems consist of various physical parts. It includes four main elements. It is used to transform, store, transport and control. Some of the benefited technologies include; Biotechnology, Information technologies, Construction technologies, Energy and power technologies, Manufacturing technologies and Transportation technologies

Sustainable Technology fulfills current demand and let future generation sustain them. It contributes to sustainable development. It uses less energy and fewer resources. It emphasizes the sustainability of technology. The advantages of Sustainable Technology are; Waste reduction, Reduces deforestation, less energy consumption, Preserve natural resource for future generation and Better quality community. The disadvantage of Sustainable Technology are that it requires High cost, i.e., not affordable to all. Sustainability should not compromise the future. It does not directly or indirectly pollute the environment. It should be an Eco-friendly technology that have alternate energy source in Sustainable Agriculture and Waste Management. The availability of Sustainable technology must be available to all people.

Sustainable Technology Concept is based on Design for Manufacturing and Design with Environmentally Sustainable Technology. The Design for Manufacturing reduces number of components and produces products that are easy to manufacture. The Design with Environmentally Sustainable Material reduces the environmental impact caused by the materials. Zero Emission is the systemic optimization approach with elements of sufficiency, efficiency and substitution. It is a key to sustainable development. It stops emission of harmful gas. Zero Emission leads to application of conservation technologies. It affords products with green rating. It reduces carbon dioxide emission. It helps manufacture green products that consume less electricity.

ROHS is the restriction of certain dangerous substances commonly used in electronic equipment. Restricted substances are Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls and Polybrominated diphenyl ether. The Motto of RoHS is to prevent pollution and save energy through the discovery and development of new knowledge that reduces and eliminates the generation of hazardous substances in the design, manufacture and application of chemical products and processes. The aim of RoHS is to prevent all new electrical equipments from containing lead, mercury, cadmium and other harmful substances.

Recyclability is the capability of being recycled. Recycling means usage of old materials to make another useful product like Paper, e-waste & plastic recycling. Some of the benefits of Recyclability are; reduce pollution caused by waste, reduce need for raw material, consumes less energy and preserve natural resources

Solving problem of sustainability involves identifying the problem, develop technical solution, evaluate the solution and finally communicate the solution. Technology has extended its use in various fields especially Health (Lung Disease, Heart Disease, Brain Disease and Cancer) and Security (Allied Military Force). Green technology is the technology that conserves natural resources and limits negative environmental impacts. Green technology uses energy efficiently and uses renewable resources. The mission of Green technology is to make green technology the leader in sustainability. The vision of Green technology is to achieve a cleaner, healthier planet through the use of Green Technology. Green technology such as, Design for reuse, Design for disassembly, Design for remanufacture, green technology has many goals such as using energy efficient, saving valuable resource, providing a healthy environment.

Social and environmental implications to protect environment is by preserving agricultural lands, preserving of forest, reducing pollution and increasing the Economy. Sustainable innovation environmental and economical dimensions and broader social and ethical dimensions. Every part of the world will be green, when every heart of human is green. So, it is our prime most duty to contribute with heart and soul for the establishment of green and sustainable technology that leads to sustainable environment by innovating something sustainably that paves way for it.

Following the presentation of all our presentations KAP dignitaries namely Shri.L.Edwin Sam, Social Scientist, Er.A.Benzigar Rajan, Dy. Manager, ISRO Propulsion Complex Mahendragiri, Shri.M.John Rabikumar, ISRO Propulsion Complex Mahendragiri, Shri.M.John Rabikumar, ISRO Propulsion Complex Mahendragiri and talent motivator of red team judged our presentation and corrected us by saying the flaws in our presentation. They also encouraged and motivated us to prepare for the final presentation which is about to be conducted at a university. Moreover they said all the students had made extraordinary presentations on their topics. By saying this they motivated students to improve their knowledge and finally concluded by saying the time and venue of next meeting.

After attending this program, I realized the significance about the sustainability in various fields such as agriculture, energy production and consumption and the importance of survival of the nature. I gained more knowledge about the significance of protecting natural resources like land, air and water. The comments and suggestions of all the judges were very useful to us. I got helpful thoughts, views and ideas from the talk of the students. I thank all the dignitaries, faculties and experts for spending their valuable time to help us improve our presentations and also for our preparation to present the Central University.

With the new day comes new strength and new thoughts!!!

Thank You KAP!!!

REPORTED BY,
GBY ATEE,
GREEN TEAM LEADER.

The first meet for the chosen young scientists was held at LMS Boys Hr. Sec. School Marthandam on 26/10/14. Then was the scientific awareness camp at CSI College of Technology, Thovalai. Here we were made aware of the need for a sustainable environment. The next meet was at MACET on 22/11/14 which was the Management Concept in Thirukkural, made us aware of the heroic role that Thirukkural plays in our life. The fourth meet was held at Govt. Medical College, Asaripallam on 29/11/2014. Here we received vast ideas about the medical field and we realized the role that a doctor plays in our life. The next camp was a Study on Sustainable Environment on 6th and 7th of December. It was on this camp that we contributed to the Swach Bharat Mission, instigated by our Prime Minister Narendra Modi. Then was the Coastal Environmental Study Camp and it was one of the best. We were made aware of the coasts around our district and we learnt the significance of them. As planned a common team meet was organized on 04/01/2015 at Hindu Vidhyalaya School, Marthandam through which we realized the true caliber of our team members. The next meet was at Government Library, Pienkulam on the 17th of January. It was the Arivial Tamil Muzhakam Program and this meet emphasized the importance of Mother Tongue Tamil. The next program was a bizarre one at IIST and it was indeed a great experience for us. Then was the Technical Presentation on Science & Technological Innovations held at Maria College of Engineering and Technology, Attoor on 14th of February. To make us realize the role of science in our life and its development in India the National Science Day Celebration on Scientific Development in India was celebrated by KAP on 28th of February at SIGMA College of Architecture, Moododu. Then was the most awaited program, the Biodiversity camp on 7th and 8th of March. It was a unique and exclusive program which made us aware of the prosperous biodiversity of our nation and the need for protection of our affluent biodiversity. To extent our skills in presentation part a common team meet was organized at NVKS School, Attoor on 15th of March, which gave all the students an opportunity to present on their team research topic. After the parents meet held at SIGMA College on 22nd of March a team meet was organized at Vpro Technologies on 28th March between 8:00am and 9:00am. The next program was organized on the very day that is the Earth Hour Program at Rotary Community Center, Nagercoil. We now have the pride of creating awareness on energy conservation on Earth Hour Program. Then we the members of Green Team planned for a team meet at the residence of the team leader, Gby on 2nd of April. This team meet was followed by another team meet at Vpro Technologies on 12th of April. After all that team meet we were trained and almost ready for the university presentation. So to give us more hope and make us completely ready for the university presentation a Scientific Talent Evaluation Program was organized at **Annammal College of Nursing, Kuzhuthurai** on 18th of April.



“A winner is someone who recognizes his God-given talents, works his tail off to develop them into skills, and uses these skills to accomplish his goals”, Larry Bird.

With so much of eagerness I outfitted myself for the Talent Evaluation Program. I was perfectly ready to present our presentation and the hope within me was great and this made me attend the program with so much of gusto. We all assembled at the college at 8:30am and the program commenced at around 9:00am. The most important principle of success is the concept of **PRACTICE**. To be successful it is also mandatory for us to use our in-born talents and to develop them. So the two keys to success are PRACTICE and USING OUR TALENTS. 'We are either growing or dying'. Using our talents and practicing assists us to grow while not using our talents and failing to practicing equals dying. Practice Makes a Man Perfect. Keeping this in mind Kumari Arivial Peravai offered us a mock presentation which was the Talent Evaluation Program. The aim of this program was to give us a final practice for the university presentation so that the fear of presenting in the university would vanish.

To start with Mr. Velaian asserted that this program would take away our fear. This will add confidence to us so that the final university presentation would go on well. He cited that the university presentation will be organized at Central University of Tamil Nadu, Thiruvarur on 26th of April. This university was built under the effort of Shri Kalaingar. The only expectation of the university professors is that we must answer every question that is asked. The book that we the young scientists have come up with, will also be published at the university. He gave a brief idea about the program of that day and then we tuned our ears to listen to the words of Er. A. Benzigar Rajan, Dy. Manager, ISRO Mahendragiri. He emphasized that we people are living a conceptual life today. Nature is a science and it must be sustained for the future generation as well. But due to our ill-human activities the nature is being depleted. Some of our activities include deforestation, pollution, global warming and the list goes on.....

Life will perish in the absence of the greenhouse layer. Without greenhouse layer the temperature would decrease to -36°C . The greenhouse layer protects us from the infrared ray. Increase in amount of CO_2 increases the absorption of infrared ray which is hazardous. There was 280ppm of CO_2 molecules in the ozone which has now increased to 410ppm. Ozone is formed by the joining of 3 oxygen atoms, and has the chemical formula O_3 . The Ozone protects us from the UV-rays from entering the atmosphere. Chlorofluorocarbons (CFCs), chlorine and bromine are mainly responsible for man-made chemical ozone depletion. CO_2 reduces the rate of recovering ozone. They indirectly lead to the depletion of ozone when in large amount. After industrialization the release of carbon dioxide has increased due to the increase in brining of fossil fuels especially the coal. Nearly 60% of the electricity is generated from coal powered thermal power plants. There is a coal seam in Rajasthan, Orissa and Neiveli. It is also present in Manarkudi but it is not mined from here because of the reason that if mined the water bodies around the region would become brackish. The root cause of CO_2 emission is the release of hydrocarbons. The temperature has risen by 1.7°C . If the same trend continues in the next 50 years the temperature would raise by 3°C . Then most likely life will perish in Earth in the next 150 years. Most cancers are caused due to the depletion of ozone.

He then added that Thiruvarur is a part of Thanjavour District. It is a fertile land due to the presence of the river Cauvery. It is also a delta region. The landscape must be flat for the formation of a delta. The most popularly cultivated crop here is rice he mentioned. One of the major components of

forest is the mountains. The two major hot spots of India are on the mountains, the Himalayas and the Western Ghats. Those parts have rich flora and fauna.

After lending our ears to the informative of talk the formal meet commenced. Ayana of green team compeered the program. The dignitaries on the dais include Er. N. Sivasubramanian, Chief General Manager Rtd. ISRO Valiamala, Mr. Mullanchery M. Velaian, Dr. T. James Wilson, Er. Benzigar Rajan, Mrs. Sujatha, the Vice Principal, Mrs. Margret and Mr. Vinifred. Followed by the welcome address by Mrs. Sujatha, Mr. Velaian, the organizer gave the introductory address. He stated that Er. N. Sivasubramanian is an active person working on creating employment for the people in Kulasekaram. He is working on developing a rocket launcher in Kulasekaram. Mrs. Sujatha, Mrs. Margret and Mr. Vinifred, the college professors are very supportive and their hospitality was great. He also emphasized the active participation of Dr. T. James Wilson and Er. Benzigar Rajan. Dr. Jeyaselvakumari was then honored for obtaining a P.H.D by the red team members.

Then Dr. James Wilson felicitated the gathering. He appreciated all for preparing well and he encouraged us all to present well. He asserted that KAP uses each and every second productively without wasting. This is one of the best feature of KAP. Then Er. N. Sivasubramanian shared some of his thoughts with us. He asserted that a good feature of the Americans is their mindset to accept the suggestions of common people. Rocket use propellants to launch the satellite. Solid propellants are efficient. If 1kg of solid propellant is used it can produce a thrust of 270. Liquid propellants are more efficient than solid. 1kg of liquid propellants can produce a thrust of about 340. A cryogenic propellant is a substance that's temperature is lower than 0°C. 1kg of cryogenic propellants can produce a thrust of about 460. It uses liquid oxygen and liquid hydrogen.

We need approximately 2 tones of cryogenic propellant and it is very expensive. So the scientists have tried an alternative propellant called semi-cryogenic propellant. It uses liquid oxygen and liquid kerosene. This is cost efficient and scientists in ISRO are working on it. But this method has already existed and Russia and America have sent rockets using semi-cryogenic propellants. Now the Americans are trying on using liquid methane and liquid oxygen. So it is better that instead of us sticking on to the already existing idea we can try on what the American are doing. Wanting to establish the existing idea is like following the beaten path and the Indians wish to do so. Being a young scientist it is our responsibility to "Make new trails in which others will travel".

We Indians are successful and our technology is advancing every day. This is a great success for us. The mission of MANGALYAAN by India was successful in its first tryout but the Americans failed nearly 41 times. When seeing this it is a great pride for us Indians to have launched successfully in the first tryout. Years back the people in Indian Parliament wanted to watch TV. But the India was not in a position to send a rocket. So the Indians solicited and finally the French people came to a deal that the Indian satellite can be taken in the French Rocket as a passenger. In this way we successfully launched APPLE. But after the success of Mangalyaan the French have come to Indians asking permission to carry their satellite in our rocket. This shows the development in India.

Indian Earth Hour capital 2015 is declared as Thane. The 2014 capital was Coimbatore. Some of the reasons behind choosing Thane as the capital were;

- ⊙ Presence of Solar water-heater and solar roofs
- ⊙ Usage of Hybrid Power (solar, wind)
- ⊙ Biomethanisation (conversion of biomass to electricity that keeps the city clean)
- ⊙ Recycling switch

He then added the tips that would make our city a capital of the Earth Hour 2016 by making our city a smart city. They include;

- ⊙ Technology based government
- ⊙ Uninterrupted water and power
- ⊙ 100% drainage and sewage system
- ⊙ Solid and water recycling
- ⊙ Quality life for urban people
- ⊙ Control pollution (noise pollution- a person who is exposed to more than 60decibal of noise continuously is most likely to have problem in their brain)
- ⊙ Controlling over population
- ⊙ Improved sanitation and hygiene (now it is a must for all infrastructures to have separate restroom for men, women and for differently able people)
- ⊙ Controlling unemployment
- ⊙ Increased safety
- ⊙ Control over crime
- ⊙ Renewal of natural existing infrastructures

Pie day is celebrated on 14th of March as the value of pie equals 3.14... On this day mathematical competitions are conducted. Sometime the sun can be found red in the morning and yellow in the evening and the reason behind this is the scattering of light. There are nearly 3 types of Moon.

- ⊙ Hunter Moon- it is the moon that appear during a full moon which is in its furthest distance from the Earth
- ⊙ Super Moon- It is the coincidence of a new moon which is in its shortest distance from the Earth, resulting in the largest apparent size of the lunar disk as seen from Earth.
- ⊙ Blood Moon- During lunar eclipse light scatters in a particular angle and this makes the moon look red and is called Blood Moon. It resembles a bad year and it occurs once in 7 years.

Even today many well educated scientists all around the world are captivated to superstitious beliefs which are scandalous news to us. One of the examples for it is that years ago when ISRO tried launching a rocket it was not successful. Once they tried it after eating groundnuts. It launched successfully and after this it became a practice for them to launch rockets after eating groundnuts.

Mangalyaan was also launched in the same way. Art is for living and science is for thinking. So both must be in equilibrium state. He emphasized that India is rich with IT power; Indian Talent and he conclude.

After a short break it was time for the **Red Team** members to present their study report presentation on the theme **Land and Forest**. Land is the area that is covered with natural resources. It is the part of the world that is not covered by oceans or water. *"Our land is more valuable than your money. It will last forever. It will not even perish by the flames of fire. As long as the sun shines and the waters flow, this land will be here to give life to", said by Chief of the Blackfeet.* Land is only resource which offers other resources to mankind. Humans should not misuse land and its resource. Land is our most important primary natural wealth. Land is a free gift of nature and it must be preserved and protected so that the future generations also use them. Our soil is a non-renewable resource. It takes thousands of years for rocks to weather into soils, and hundreds of years for rich organic matter to build up. Humans have degraded a large portion of natural land. Land conservation attempts to combat land degradation through preservation, restoration, remediation, and mitigation. Due to the expansion of agriculture lands forest lands have been cleared. More destruction has been done after industrial revolution and urbanization. One of the major impacts of forest depletion is soil erosion and decline in the level of ground water table. Trees have the ability to hold water and soil but when they are being cut the ability is lost. Afforestation is the best method to combat the destruction of forests. According to sustainability principles environmental management involves managing the land and forest. Forests moderate the local climate and the global water cycle. They also conserve biodiversity, protect water quality, preserve soil, provide fuel and purify the air. By implementing Sustainable Land Management methods long-term productive potential of the land resources can be ensured and the environmental functions can be maintained.

Followed by red team was the presentation of **Yellow Team** on **Water**. Water is a natural resource in the Earth. Water is essential for our life. Water cannot be created. The water which we use today is what was available billions of years ago. This is possible because of the natural water cycle. Water pollution is the contamination of water bodies by human activities. This occurs when the pollutants are blend with water and create a change in the physical, chemical and biological nature of water. Pollution of water is a major problem that is faced today. Water covers 71% of the Earth's surface. The population is increasing and there is also an increase in the demand of water. The most suitable way for using water sustainably is this is the construction of green buildings in which the overall water consumption is reduced by activities like fixed usage and increases in wastewater reuse. Science and technology benefit society in a variety of ways. New technology allows increased productivity. The major role that sustainable technology is most likely to play in our life is solving problems that are cause by the activities of we humans.

Then was the presentation by **Maroon Team** on **Agriculture**. Agriculture means the production of crops and live stock on a farm. Sustainable agriculture is a type of agriculture that focuses on producing crops and livestock while having negligible effects on the environment. This type of agriculture finds a good balance between the need for food production and the preservation of the

ecological system within the environment. The modern agriculture is maximizing the use of fertilizers, consumes more energy and is not managing all the systems in a proper way. Agriculture is not only meant for the present generation in order to produce food but also for the future generations. If agriculture is not sustained it would not last for long and the future of agriculture will be in doubt. The usage of fertilizers, pesticides and insecticides has possibly increased the yield of the crops but has impaired the quality of agricultural land and has made it unsustainable. Almost all the 38% of the Earth's land surface is getting degraded due to the addition of fertilizers. Sustainable Agriculture is capable of maintaining productivity while sustaining it for the future.

After lunch break we the **Green Team** members presented our presentation on the theme **Energy**. Energy is an important aspect of our life. It is not possible for us to live a day without energy. **'Energy can neither be created nor be destroyed'**, is a basic scientific law. Energy can be converted from one form to the other and it is the conversion of energy that makes us use energy. Our demand is increasing and the major impact is on the future generations. The increase in release of huge quantity of green house gases, exploitation of natural energy resources, dwindling fossil fuels is forcing us to search for alternate source of energy. The renewable energy such as solar, wind, tidal, ocean thermal energy etc. can be fully exploited to meet the growing energy requirement. Thus it is very important for us to minimize the consumption and maximize the conservation. Sustainable energy is the energy source which can meet the growing demand of today's people without compromising the future demand. Multiplying the energy efficiency has led to plentiful remuneration to the natural ecosystems. Energy efficiency is the most sustainable way to use energy. As our dependence on fossil fuels is great today it is a must for us to switch our dependence on renewable resources that would sustain the energy resources for the future as well.

Finally the last presentation was by **Blue Team** on the topic **Technology**. Technology benefits the society in various ways. Technology is the collection of paraphernalia used by humans. It can also be defined as the application of scientific knowledge for practical purposes. Technology is being implemented in every part of our life, may it be business, education, transportation, communication or even in agriculture. Technology plays a significant role in all the activities. The increase in technology has created bad impacts on the environment like increase in air pollution and has led to the rise in global warming. Therefore there is a quick need for Sustainable Technology today to sustain in the environment. Sustainable technology has been defined as technology that is present for our current needs without sacrificing the need of future population to sustain them. Some of the best technologies that contribute to the creation of a sustainable environment include the RoHS, recycling and the Zero Emission concepts. Using them efficiently can lead to a sustained life.

After all the presentation questions were asked by professors and the members of KAP as well and this made us all get a good idea about the university presentation. Dr. Jayala then felicitated the gathering. He in his talk stated that we have to include new facts and ideas on our topics. The best way to present such presentations is to include our own innovations and what we are going to do towards creating a sustainable environment. Our imagination can be enhanced by trying new innovations and this kind of presentations.

Followed by his talk Mr. John Rabi Kumar stated that Dr. Jayala is a great surgeon. He is also a great orator and his talks are very motivating and he motivates young minds like us to become great orators as well. Mr. Vinifred then added that we must convey our own suggestion in the presentation. Mrs. Margret stated that our presentation part was good and as we call this as a research work the presentation would be even better if we add some surveys and statistics. Mrs. Sujatha then said that as we young scientists are getting more opportunities we must try to do our best and we should use those opportunities to their extent. Mr. John Rabi Kumar suggested us to take every correction in a good manner and do the appropriate corrections. We should also try and work hard to make our presentation even better by practicing more. Finally Er. Benzigar Rajan stated that many of us are not aware of the basic concepts in our topic so we must read the research work once again and be through in our topic. He shared his overall view about the presentation and he suggested all to be more confident while presenting. We must also be ready to answer every question and try answering those even if we don't know.

The meet finally terminated and my heart was filled with the joy of presenting well. I was sure that it was the effort of my team and also because of our continuous practice that we performed well. *'Practice as if you are the worst; perform as if you are the best'*. Keeping these words in mind we performed really well. It trained us to face any sort of questions and we became much more confident. Our fear was gone and we were ready to answer the questions raised by the professors. In each and every meet our fear was taken away slowly. The eagerness to present at the final presentation filled our mind. Through this meet we were able to enhance our presentation skill and also our answering skill. This was indeed a great opportunity for us. I extend my deep sense gratitude to KAP and the management of Annamal College of Nursing for arranging the meeting. Thanks to all members of KAP especially to Mr. Velaian the organizer, Mr. John Rabi Kumar, Mr. Sahajan, Mr. Johnson, Mrs. Papitha, Mrs. Krishnakumari, Er. Benziga Rajan, Er. Sivasubramaniam, Miss. Anish, Mrs. Sujatha, Mrs. Margret and Mr. Vinifred for their support in making this program a grand success.

REPORTED BY,
DANI ROVAS
MAROON TEAM CO-LEADER



If you don't practice you don't deserve to win. We achieve and are successful in all our attempts only with practice. That is why a proverb states that **Practice makes progress. Talent hits a target no one else can hit.** This clearly specifies that not only practice is essential for the accomplishment of our tasks; talent is also very important for this. Talent is clearly defined as follows: **Your talent is**

God's gift. What you do with it is your gift back to God. Then having talent, the way we use it matters a lot. If you have talents use it in every way possible. Our talent must be evaluated in a proper manner so that all our blunders can be rectified. **True genius resides in the capacity for the evaluation of information.** So our evaluation also matters. **The most effective evaluation comes from someone who sits beside us and helps us grow.** The only way through which we can contribute

to make us better from the evaluation is by the advice of Kevin McDonald. **The biggest evaluation is working hard.** As our talent gets evaluated, we should work harder and harder to make it better and better as **'The more I practice the luckier I get'** said Arnold Palmer. **Don't practice until you get it right. Practice until you can't get wrong with it.** Only then we will be through with our concepts or else our performance will be pitiable.

Keeping this in mind and to provide maximum practice and evaluation to the young scientists we had our mock session on 18th of April in Annammal College of Nursing, Kuzhithurai. **Practice isn't the thing you do once you are good. It's the thing you do that makes you good.** This meeting was conducted with an aim of making us learn our concepts thoroughly as Mahatma Gandhi said **Learn by practice.** This meeting will be the only way to make us shine in our final presentation as **'There is no glory in practice, but without practice there is no glory'.** In this meet we were evaluated and scouted by the moderators for the perfection of our presentation in the final presentation at Central University of Tamil Nadu.

The meeting began with full of gusto in all the young scientists as we were ready to correct ourselves so that our final presentation will be successful. All of us assembled there at 8:50 am. Mr.Mullanchery M.Velaian gave some common annotations. He said that this meet aims at taking off the fear in all of us and make all confident enough to present in a university in front of eminent dignitaries. Because it is precisely said that **Confidence comes when you are ready to face all the questions.** He also informed us about our next meet at Central University of Thiruvarur and concluded his talk.

Next Er. Benzigar Rajan addressed us. He said that we should present according to our concept and answer all the questions asked. He then gave a short introduction to SUSTAINABLE ENVIRONMENT. **Sustainability creates and maintains the conditions under which humans and nature can exist in a productive harmony.** Nature is the material world that surrounds humankind and exists independently of human activities. Nature has to be sustained as we are also a part of it by involving in human activities. Thought the nature provided everything to fulfill mans need, man has become greedy and is involving in inhuman activities that harms our environment. This greatest threat is caused to nature only because of the thought of humans that someone else will save our nature. Thomas said, **"We never know the worth of water till the well is dry"**. Similarly the value of our Mother Nature will not be understood by mankind unless he suffers from no protection, no care, no shelter and no food. Our inhuman activities that spoil our environment from sustainability include:

- a. **Deforestation:** This is the process of cutting down of Trees. Every 45 minutes a hectare of the world's forest is destroyed by deforestation. A report also indicates that deforestation destroys over two acres of land per second.
- b. **Polluting Water Bodies:** Water resources are polluted usually by waste waters. Each year, the world generates 400 billion tons of industrial waste, much of which is pumped untreated into rivers, oceans, and other waterways.
- c. **Polluting Air:** The air is polluted mainly by burning fossil fuels.

- d. **Polluting Land:** Land is polluted by striking down the forests, throwing plastics and introducing chemicals to the land.
- e. **Depleting Ozone Layer:** The layer of green houses in the atmosphere maintains the average temperature of the Earth. Without this layer the temperature of our planet will be -36°C . Without this layer we humans will perish. Greenhouse gas layer prevent us from infrared rays emitted by the Sun which has a temperature of 6100°C inside it and 15000°C outside it. Before Industrial Revolution in the mid 18th and 19th century, the amount of carbon dioxide in the atmosphere was 280ppm. At that time there was no carbon dioxide emissions. After Industrial Revolution due to the burning of fossil fuel especially coal for coal-based-thermal station for the generation of electricity, carbon dioxide was emitted into the atmosphere in large quantities. The amount of carbon dioxide emitted also varies from coal to coal. Australian coal emits less carbon dioxide. Throughout the world there are many regions with coal. In India states like Rajasthan, Orissa and Tamil Nadu have more coal resource. Orissa is the state which is enriched with more coal. In Tamil Nadu, places like Neyveli and Mannargudi have more coal reserve. Mannargudi is one of the biggest coal reserves but coal is not mined from there because coal is very deep under the Earth here and so if the coal is mined then people of three districts will be affected Ozone layer is depleted due to the dumping of more greenhouse gases like carbon dioxide into the atmosphere. This leads to the trapping of infrared rays thus leading to global warming. This cause increase in temperature. Global warming is caused by green house gases like carbon dioxide, methane, sulfur dioxide and chlorofluorocarbons. Hydro-carbons are the route cause for carbon dioxide emissions to the atmosphere. Previously the amount of carbon dioxide in the atmosphere was 280ppm but currently the amount is 410ppm. The impact of increased amount of carbon dioxide is the increase in temperature. The increase of 130ppm of carbon dioxide in the atmosphere leads to an increased temperature of 1.7°C . If this trend continues, by 2050 humans will not be able to survive. Within 150 years, no life will exist on Earth. So, we should reduce the consumption of electricity and use it efficiently. The chemical formula for ozone, which prevents the ultraviolet rays of the sun from entering, is O_3 . The usage of chlorine is spoiling the ozone. Chlorine is used in hospitals to faint the people. It also used in refrigerators and air conditioners in the form of chlorofluorocarbon. Chlorine is the man-made component that depletes our protective ozone layer. When chlorine reacts with ozone, it puts a hole in the ozone layer and so the ultraviolet rays from the Sun directly hits us, causing skin diseases, cancer and impotence to humans. Though we are suffering from all these even now, we are not realizing our fault and are continuing to do the same harms to our Mother Earth. His talks made me feel that **I want to create a world where the environment doesn't need any protection and will remain in a sustainable manner.**

He then shared information about Thiruvarur to us. This is a part of Thanjavur Districts. It is a fertile land and delta region of River Cauvery. The special landscape of this land makes it differ from Kerala because though Kerala has many rivers in it, it has no delta because of its landscape but Thiruvarur has delta region. Thiruvarur is also plain land region where the staple food is rice. Now many coconuts are also being planted in Thiruvarur. In the seashores of Thiruvarur, many prawn farms are there and this is encouraging the export of prawn in this region. The building of many prawn farms, the sea water is entering the sea shore and is spoiling it. He also said about the richness of biodiversity. In the past before the plantation of rubber, 33% of the land in Kanyakumari District was covered with

forest. Nowadays forest cover is diminishing rapidly. The essential element for forest is mountain. But the mountain resource is not sustained properly. The two hotspots of India are the Himalayas and the Western Ghats. 16% of the flora and 14% of the fauna in India are enriched with biodiversity. With this he winded up his talk.

Inaugural Ceremony began at 9:30am in the presence of dignitaries including: **Shri.N.Sivasubramaniam**: Chief General Manager Rtd. ISRO Valiamala, **Mr.Mullanchery M.Velaian**: Organizer of KAP, **Mrs.Sujatha**: Vice Principal Annammal College of Nursing, **Mrs.Margaret**: Reader Annammal College of Nursing, **Mr.Benefred**: Reader, Annammal College of Nursing, **Dr.T.James Wilson**: Chairman Sigma College of Architecture, **Er.A.Benzigar Rajan**: Dy.Manager ISRO Mahendragiri, **Shri.M.John Rabi Kumar**: Moderator, **Shri.L.Edwin Sam**: Moderator, **Shri.Sahajan**: Moderator, **Shri.S.Johnson**: Moderator, **Smt.Jayaselvakumari**: Moderator, **Miss.Jeswini** : Moderator, **Mrs.Krishnakumari**: Guide Teacher, **Mrs.Pabitha**: Guide Teacher, **Miss.Anish**: Guide Teacher, **Mrs.Radhika**: Guide Teacher. Ayana of Green Team anchored the session. Goddess Tamil was then invoked by the Young Scientists. Mrs.Sujath welcomed the distinguished personalities, the noble and selfless souls of KAP, the parents and the young scientist who are the future leaders and pillars of the nation.

Then Ayana invited Mr.Mullanchery M.Velaian to give away the Inaugural Address. He hailed all once again to the meet. During his hail, **Shri.N.Sivasubramaniam** was recognized with a shall, **Mrs.Sujatha**, **Mrs.Margaret** and **Mr.Benefred** were presented with last year's book entitled *Nurture Nature*. **Smt.Jayaselvakumari** was honored for her achievement for receiving her graduation in PhD.

Dr.T.James Wilson felicitated the gathering. He said that this is the last stage of presentation for us and we should practice a lot to be victorious in our final presentation. He also mentioned that whenever time spent with KAP, it is spent advantageously and valuably. All those who are trained and nurtured with KAP are transformed into a successful being that are very knowledgeable. World is very competitive nowadays and so we should be courageous enough to compete the world. A student is renovated into a person who is very spirited and audacious only with KAP, which is a voluntary organization that guides and fosters the rural children with scientific thoughts and philosophy.

As we were waiting with full ebullience to hear to the special address of our honorable chief guest, Shri.N.Sivasubramaniam addressed us. He first gave us some advices. He said that whatever we suggest, it should be recognized whether it is right or wrong. He then said the application of **cost-effectiveness** and **reliability**. Firstly, the fuel used in rocket was solid propellant. This produced only 270 thrust from 1kg fuel. Next liquid propellant was used. This produced 340 thrust from 1kg fuel. Cryogenic propellant was then made of liquid hydrogen and liquid oxygen. This produced 460 thrust from 1kg fuel. 1kg of liquid hydrogen cost Rs.50000. We need nearly 20000tons of liquid hydrogen which will cost nearly Rs.100000crore. So, semi-cryogenic propulsion is being introduced. In this kerosene was used instead of liquid hydrogen. Kerosene is very cost-effective as 1kg cost only Rs.8. It is also reliable as it produces more thrust from less fuel itself. This semi-cryogenic propulsion is going to be introduced in GSLV and PSLV in another 3-4 years. This semi-cryogenic propulsion was introduced in rockets sent by Russia and America before 50 years in 1963. But it is established in our

country only now. But there is no specific answer to the question for 'Is this necessary?'. Now Americans are trying to use methane instead of liquid hydrogen. He then questioned us 'Should we go in the beaten track or in new track?'. All the young scientists answered as we should go in a new track. He then said that, that is why KAP is creating young scientists like us by satisfying their hunger of Science.

By successfully achieving the MOM mission with Mangalyaan in the first attempt itself we have proved that we Indians have the capability of doing whatever we want. This also brought fame to our country. He also said that the reason behind this was that we learned from the mistakes of other countries. APJ Abdul Kalam said **Failures are the stepping stone to success**. Also in earlier times when television was not affordable in India everyone asked for it. Then it was said that if we want television we will need a satellite. Even the Indian scientists agreed and said that they will build a satellite but the problem is that there is no rocket to launch it. Then it was being planned that satellite will be borrowed from another country. India had to beg to other countries and finally France accepted to launch our satellite in their rocket. This is our condition previously. But now after our successful launch of Mangalyaan, France is asking to launch one of their satellites in our launch vehicle, PSLV. He thus concluded from this that, though we are advanced in some technologies we are lacking in some of it. So, we should work hard to bring India top in all spheres.

He then enhanced us with information on Earth Hour. He asked the when is Earth Hour celebrated this year. We all answered it as March 28. 2014 Indian Earth Hour capital was Coimbatore. WWF selected 2015 Indian Earth Hour capital as Thane. Among the finalists of Thane, Rajkot and Pune, Thane was selected as the 2015 Indian Earth Hour capital for the work the city has done in the field of renewable energy production and energy efficiency for the sustainable energy production of future generation. The strategies the city took include:

- Generated maximum power from solar energy
- Use of wind-solar hybrid systems
- Use of solar water-heating systems for municipal buildings
- Use of solar energy for lighting and air-conditioning
- Construction of bio-mechanization plant for generating electricity from the biogas produced from waste
- 3-cycling switching for energy conservation of public lights

What should we do to make Kanyakumari District the best Indian Earth Hour Capital?

- ✓ Make every city a smart city. This technology based governance will enable 100% power supply and water supply.
- ✓ 100% sewage and drainage discharge system. This system should recycle the sewage for at least 3 times.
- ✓ Solid Waste Management should be practiced. In this the wastes must be processed and should be managed.

India's dream city is SMART CITY. What should be done to fulfill it?

- Adverse undesirable civic condition through the accomplishment is Swachh Bharat mission.
- Reduce over-crowding.

- Improve Sanitation. Confirm that clear-cut hygienic toilets for men, women and handicaps are offered in all schools and even other institutions.
- Develop proper water sanitation.
- Reduce unemployment.
- Ensure safety for women and control over crime.
- Control pollution, especially air pollution, water pollution and noise pollution.
- Renewal of natural existing infrastructure to sustain our environment.
- Decentralization of sewage plant for the reprocessing of sewages.
- Maintaining energy loss through proper grid system and green structures.
- Put into practice mass transfer system.

He then questioned us. He asked the following questions.

1. When is pie day celebrated?

March 14

2. How many types of moon are there? What are they?

There are about 4 types of moon. They are

- Blue moon: Occurs very rarely. It is also used as an idiom- once in a blue moon.
- Hunter moon: Used to describe the moon when it is farthest from the Earth.
- Super moon: Used to describe the moon when it is nearest to the Earth.
- Blood moon: It occurs on lunar eclipse. As the atmosphere scatters, the moon seems to be in blood red color. This occurs once in seven years. This moon symbolizes bad omen.

Shri.N.Sivasubramaniam concluded his talk thus saying: India is a place of ideas due to the skills and talents of the Indians and is also well-known for its IT (Indian Talent). Think logically, analytically and apply it in mind for your success. **Let Science be in mind; Let God be in your heart.** With this he concluded his talk.

Gby Atee of Green Team gave the Vote of Thanks. She expressed her gratitude to them by showing the simplest act of saying THANKYOU as a demonstration of gratitude in response to their greatest mind for offering us this greatest chance to conduct the meeting as well as for enriching our knowledge with their words. With this the Inaugural Ceremony came to an end and the Presentation Session began after the tea break. During the presentation session we were moderated by: Shri.N.Sivasubramaniam, Mrs.Sujatha, Mrs.Margaret, Mr.Benefred, Er.A.Benzigar Rajan, Shri.M.John Rabi Kumar, Shri.L.Edwin Sam and Shri.Sahajan. After the presentation of each team, we were questioned on our research topic.

Firstly, the Red Team presented their presentation on their topic: **Land and Forest.** Our land is home to many unique plants and animals. We abuse land because we regard it as a commodity belonging to us. When we see land as a commodity to which we belong, we may begin to use it with love and respect. All type of organism including man is born, flourish, mature and at last meet their end on land. We have made our land dirty, populated and polluted. Forests are considered to be the Lungs of the Earth. Forests are nature's water factories. Trees act as purifiers of air and receptacles of our waste products. But, we humans, the greedy animals made the air we breathe, the water we drink, the

soil which produces crops more and more impure. They emphasized the importance, necessity, urge of safeguarding our land and forest through sustainable concepts of land. Some of the questions asked to them were:

- 1) Why Kerala gets less rainfall when compared with Andhra Pradesh?
- 2) When is world forest day celebrated?
- 3) Types of land according to Tamil culture:-
- 4) What is biotic pressure?
- 5) What are the laws enacted for the conservation of forest?

Yellow Team then presented on their research topic: **Water**. Since water is a renewable resource, we are not using it efficiently and making it a non-renewable resource. Nearly 2 billion people lack access to clean water and 1 billion people do not have enough to even meet their daily needs. Will we at least understand the importance of water when the world is dry out of it? Access to quality water plays a key to economic prosperity and better living standards. Sustainable water management find solution and give suggestions for the efficient use of water providing some water to all instead of all water for some. They specified more statistics that made us understand the rate at which we are wasting the water resource. They concluded thus stating, as we become aware, we need to put what we learn into action as this is the only way we can allow nature to catch up with the rate at which our requirements grow. Some of the questions asked to them were:

- 1) Name the major lakes in Tamil Nadu:-
- 2) Name the important rivers in Tamil Nadu:-
- 3) Do we have sewage treatment plants in Kanyakumari District? If yes, where?
- 4) Do we have water treatment plants in Kanyakumari District? If yes, where?
- 5) Name some of the programs implemented by the government for proper water distribution:-

Next was Maroon Team's turn to present on their research topic: **Sustainable Agriculture**. All need food. At present, agriculture should feed a population of 6.4 billion but produces only 22 trillion calories annually, sufficient for only 5 billion people. Despite great agricultural advances, millions go hungry or live under threat of famine. How do we sustainably produce food without harming the environment? It is possible only with Sustainable Agriculture which largely focuses on Organic Farming. They highlighted on the point- The first farmer was the first man and all historic nobility rests on possession and the use of land. Maroon Team explained the significance of sustainable agriculture and the effects of following the modern agriculture. Some of the questions asked to them were:

- 1) Name the soils used for cultivations:-
- 2) Is agriculture an industry?
- 3) What is contract farming?
- 4) Why don't we prefer modern irrigation systems, though it irrigates only a small amount of water to the crops?
- 5) When is world soil day celebrated?

Green Team presented on their research topic: **Energy**. They started with a volume of questions like “How do you play? How do you work? How do you learn? How do you drive to school? How do you read books or listen to your favorite songs? And how do you grow or think? The ultimate answers to all these can only be ENERGY. If we don’t reduce our dependence on non- renewable resources and if we don’t use energy efficiently then in 100 years from now, we will have nothing left to build on. They stated that being efficient with energy will possibly lead to sustainable environment by reducing the green house emissions. They have not only mentioned the sustainable energy use but also the ways through which we citizens of the world can contribute to conserve energy. They have clearly stated the alternate ways to generate energy without harming the environment like waste-water electricity generator, new nuclear material; Thorium, waste sourced bio-fuel, molten salt storage and even the technologies based on coal. Some of the questions asked to them were:

- 1) Name some types of renewable energy:-
- 2) What is the logic behind hydrogen vehicle?
- 3) When is world energy conservation day celebrated?
- 4) What is power grid?

Dr.Jayalal accompanied us during the presentation. He was welcomed Last but not the least, Blue Team presented on **Technology**. Technological advancements are speeding along the evolution of man’s industrial greatness. There are both pros and cons of technology use. The modern technology is unsustainable and is degrading the environment through various ways. Since technology is having a very great impact in each and every part of our life, we should know how to use technology sustainably even in every sector. They have focused on green technology for a sustainable environment. They specified the greener way to manufacture products with the implication of technology by minimizing the emissions, use of non-renewable forms of energy and making the product affordable. The concepts like zero emission, restriction to hazardous substances, eco-innovation and sustainable innovation has imbibed technology in order to create a greener environment. Every part of the world will be green when every heart of human is green. The Blue Team members were also questioned by the moderators.

After the presentation session, the moderators gave suggestions about our presentations. The common suggestions include: we should have linking sentences between each point and each slide, we should include our suggestions in our presentation, we should be more confident while answering the questions, and we should answer all the questions asked to us. The meeting came to an end with National Anthem. Then we all dispersed from Annammal College of Nursing.

This meet was something special to me as this meet made me feel confident enough in presenting the presentation as well as answering all the questions without fear. This meet also enabled me to believe in me that I will be able to present with full buoyancy and optimism in front of all the personages present. I am thankful to Annammal College of Nursing and Kumari Arivial Peravai for conducting this program of Scientific Talent Evaluation for giving me a mock session on our final presentation as well as making my mind confident enough to present without any depression and gloominess. I am thankful to KAP and the college for giving me such a great opportunity. THANKS!!!!

REPORTED BY,
RESHMA
MAROON TEAM LEADER

“To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science”. - Albert Einstein

The scientific talent evaluation programme was held at Annammal College of Nursing, Kuzhithurai on 18th April. I reached the destination at 8:15 am. All the young scientists assembled in the conference hall at 8:30 am. **Shri. Mullanchery M.Velaian, the organizer of KAP** spoke few words.

He stated that the evaluation programme eradicates fear from us. He highlighted few points about the



Central University of Tamil Nadu, Thiruvarur. The programme was first fixed at Indian Institute of Technology (IIT), Chennai and later it was changed, he said. He provoked our knowledge by saying that we should answer all the questions raised by the judges. The KAP book will be published at Thiruvarur. It consists of 414 pages, he said gladly. Then he said the approximate schedule of the next programme. The boarding point is at Marthandam bus stand on 25th April at 4:00 pm. Another boarding point is at Nagercoil, near Udipi hotel by 4:45 pm. He informed us to bring our night dinner. We would reach Thiruvarur by the next day 4:00 am. Breakfast will be provided, he told. The inaugural function would begin by 9:00 am and our presentations would begin by 10:00 am. After our presentations we would have campus visits and interactions with scientists. We would see around Thanjavur if possible, he said. Then we would go to IMA (Indian Medical Association) and would have a conference by 6:00 pm. We would come back the next day.

The mike was then handed over to **Er.A.Benzigar Rajan, Deputy Manager, ISRO Mahendragiri**, He began by stating that nature is a science. The things that we see on the earth and beyond the earth are nature. Nature has to be sustained. We too are a part of nature. But we humans are doing inhuman activities like deforestation, polluting the water bodies, polluting the air by burning fossil fuels, polluting the land by chemicals and plastic bags, depleting the ozone layer and dumping CO₂ in the atmosphere and others. Due to the depletion of ozone layer, the infrared rays pass to the earth and causes global warming. The green house gases like methane, carbon dioxide, sulphur dioxide and chlorofluorocarbons form a thin layer. If this layer is absent, then the earth would be in -33° C. We humans would perish if this layer is absent. In the 18th century, before industrialization took place in Germany and England, the quantity of CO₂ was 280 ppm (parts per million). After industrialization, coal based thermal plants were constructed. In this world, about 60% of electricity is generated in coal based thermal power plants.

States like Rajasthan and Orissa have more coal in India. In Tamil Nadu, coal is mined in Neiveli and Mannarkudy. In Mannarkudy, the coal is not being taken because then the people of Trichi, Thanjavur, Nagapatnam have to be evacuated due to the salinity of the land. The main source of carbon

dioxide is hydrocarbons. The quantity of CO₂ at present is 410ppm. Due to the rise in quantity of CO₂, 1.7°C temperature has been risen. If quantity of CO₂ decreases, we can maintain this temperature and save the earth but if the temperature rises more than 3°C then we would not be able to control the temperature. It is estimated that by the year 2050, the temperature would rise to 3°C. Everything is based on our activities. We should reduce the consumption of electricity and automobiles. The ozone protects us from ultra violet rays whereas the green house gases protect us from infrared rays. The temperature of the sun in its interior is about 6 lakhs°C and on the surface it is 50,000°C. The usage of chlorine has depleted the ozone layer. The refrigerators and air conditions which we use in the home emits CFC. If chlorine mixes with ozone, it may leads to holes in the ozone layer. Thus, we humans may be affected by skin disease, cancer and other disease.

Then he put forward few points about Thiruvarur. It is a part of Thanjavur district. It is a fertile land of river Cauvery. Thiruvarur is a delta region and has a plane landscape. The sea and land present there will not have much elevation difference. Rice and coconut production are more here. Fish are caught by the people in coastal areas and are sold for money. Due to this, the water in the sea comes to the land and thus the land becomes salty. Agriculture is affected due to this. Kanyakumari had about 33% of forests before rubber plantation began. But after the beginning of rubber plantations, the forest coverage has been reduced to 19%. Thiruvarur has no forest. The essential components of forests are mountains and trees, he added. He also explicated about the biodiversity hotspots. In India, there are two biodiversity hotspots which are the Western Ghats hotspots and the Himalayas hotspots. Wealth is found in Thiruvarur but no minerals. He then concluded his talk.

By 9:25 am, the inaugural session began. The compeering was done by Ayana Treesa Raj from green team. First she gave an introduction about KAP and Annammal College of Nursing, Kuzhithurai. She then invited the notables to the Dias. The notables include Mrs.Sujatha, Shri.N.Sivasubramanian, Shri.Velaian, Dr.T.James Wilson, Er.A.Benzigar Rajan, Mrs.Margaret and Mr.Winifred. According to the renowned Tamil tradition, the programme began with Tamil Thai Vazhthu. It was sung by KAP students. **Mrs.Sujatha, Vice Principal, Annammal College of Nursing** welcomed the gathering. She first welcomed Dr.Jayalal and Dr.Sheeba Jayalal. The chief guest, the moderators, dignitaries, guide teachers, parents and the KAP students were given a hand of greeting. The introductory address was given by **Shri. Mullanchery M.Velaian, the organizer of KAP**. He firstly gave a brief introduction about the chief guest Shri.N.Subramanian. His presence gave us more motivation. Dr.T.James Wilson glorified him by giving ponnadai. Mrs. Sujatha, Mrs. Margaret and Mr. Winifred were introduced to us and last year KAP books were given to them. Er.A.Benzigar Rajan and Dr. Jayalal were too introduced. He then welcomed all the guide teachers, consultants and coordinators. A memorial prize was given to Dr. Jayaselva Kumari for receiving Phd. We all joined our hands to congratulate her. Red team gave her ponnadai.

Then the mike was handed over to **Dr.T.James Wilson, Chairman Sigma College of Architecture**. He felicitated the gathering. He said that we are in the last stage of one year KAP journey. We would surely feel the change in ourselves after the completion of the one year KAP programme, he stressed. He appreciated Annammal College of Nursing for hosting the scientific talent evaluation programme. He ended his talk by wishing us a wonderful and successful day.

Shri.N.Sivasubramanian, Chief General Manager Rtd ISRO Valiamala, gave the inaugural address. He told some of his experiences. He appreciated KAP for its task. Once NASA shuttle mission failed and so he gave some suggestions. He suggested that the mission should be cost effective but reliable. Americans recognise people's suggestions and provide certificates to people. He said that Asians do not have this character. Mangalyaan was launched from Sriharikota. It was about 1350 kg. But if the same Mangalyaan was launched from Kulasekaram, it would be almost as 1750 kg. He told about the fuels which the rockets use. Solid propulsion fuel gives about 260 kg of pushing force and liquid propulsion fuel would give about 340 kg of pushing force. Cryogenic fuel is something which is below 0°C. Liquid hydrogen and liquid oxygen would make cryogenic fuel. It gives about 460 kg of pushing force. The cost of 1 kg of liquid hydrogen is about Rs.50,000. So, ISRO have planned to launch rockets with semi cryogenic engine in 3 or 4 years. In semi cryogenic engine, liquid oxygen is mixed with kerosene which is cost effective. In the year 1963, Russia and NASA launched rockets with this semi cryogenic engine. But we Indians are going to use the 1963 technology, he added. Americans are going to launch rocket in 2016 which would contain liquid methane and liquid oxygen as its fuel. He raised us a question. Why are we going to the technology which NASA did 50 years before? This question made us to think out of the box. He said that modern technology should be used to launch Indian rockets and that's why we young scientists are being created.

He imitated the words of **Dr.A.P.J.Abdul Klam "Failure is the stepping stone to success"**. He shared few more things. In 1978, India's political leaders asked for television in the parliament. But in order to receive signal, artificial satellites should be launched. So the people of ISRO said that we can launch satellites but we don't have rockets. So India asked for rockets to different countries. Thus, the satellite APPLE was launched in France rocket. The same France country is now asking us Indian rockets to launch their satellites, he added. So technology has grown well in our country. He then continued his talk with the Earth Hour Day celebrated on March 28, 2015. The Indian Earth Hour capital for the year 2015 was Thana in Bombay. In 2014, it was Coimbatore in Tamil Nadu. Four cities competed one another for becoming the capital this year. They are Rajhat, Surat, Pune and Thana. The World Wide Fund organization selected Thana. He listed few reasons for Thana to become the capital of Earth Hour Day 2015:

- Solar water heaters and rooftop solar power.
- Hybrid power (e.g.: solar and wind)
- Biomethanization plant which recycles waste into biogas and electricity.
- Energy conservation of public lighting system.
- They made sustainable energy for future.

He then shared us few tips to make a city the capital for Earth Hour Day:

- ✓ Make every cities as 'smart cities'
 - Technology based governments
 - 24 hours uninterrupted electricity and water
- ✓ 100% sewage and drainage system
 - 3 times recycling and using best parts of it
 - Solid waste management
- ✓ Maintain hygiene and sanitation

- Toilet facilities for men, women and handicaps
- ✓ Reduce unemployment
- ✓ Safety for women and reduction of crime
- ✓ Control pollution
- ✓ Renewal of existing infrastructure
- ✓ Recharging of ground water
- ✓ Decentralization of sewage plant
- ✓ Maintain energy loss
 - Proper grid structure
 - Place for parking and pedestrians to walk
- ✓ Efficient means of public delivery to the people

He then said about pie day. Americans celebrate 14th March as pie day. He then explained the types of moon.

- ❖ Blue moon – very rare
- ❖ Hunter moon- on purnima, the moon will be in the farthest distance from the earth
- ❖ Super moon- on purnima, the moon will be in the nearest distance from the earth
- ❖ Blood moon – one of the eclipse of moon once in 7 years

Places like Northern America, Northern Pacific and Northern Canada would experience this when the sun's rays go beyond 38°. According to Greek mythology, the year when blood moon occurs will not be good. In India, a rocket launch failed three times. So the scientists took some rest and ate peanuts and drank tea. Then they casually launched the rocket. The rocket launched successfully. This became a belief. So whenever a rocket is going to be launched, the scientists would eat peanuts. He then said that India is a place of ideas. Germany is a place of engineers, Gulf is a place of oil, America is a place of opportunities whereas India is a place of IT power which stands for Indian Talent. By saying this, he ended his talk.

Subsequently the vote of thanks was proposed by **Gby Atee**. She first thanked Lord Almighty for showering his blessings for a good beginning of this programme. She then thanked all the dignitaries and moderators. She finally thanked the management for providing us enough space and facilities to conduct the scientific talent evaluation programme. After that we had a tea break at 10:45 am. The management provided snacks and tea for us. The break got over by 11:00 am.

It was the time for us to present our Power Points. First it was the turn of the red team members to present their PowerPoint on their research topic "**Land and forest**". S.Abina, the leader of red team gave a brief introduction to the topic. She defined the term "sustainability" and also about the land. A.S.Induja, the co-leader of red team explained the special features of land and differentiated between land and soil. She listed the special features and their geographical percentage of those in India. The types of lands were also described by her. Then R.S.Raksha put the concept of land use and land degradation and its threats in her own words. M.Sabrina elucidated about the major types of land degradation and land contamination and their causes. Nishanth explained the slides about conservation of land. The sustainable concepts for land and land management were explicated by C.J.Nivedh Sankar. Pradeep expounded on the subject of green town cities. Jaslin Nels told about the land in India. Then a succinct preface about forests was given by S.Abina. She also made us clear with some facts of forests.

The functions of forests were explicated by A.S.Induja. Raghul gave us a clear cut idea about deforestation, its causes and effects. The technologies to conserve forest were put in words by Vinoth. C.J.Nivedh Sankar emphasized few principle land policies of forest management. Mejalín Arno told about the forest resources in India. The presentation was terminated by the leader of red team. Questions were raised by the moderators and chief guest to kindle our knowledge.

✚ When is World Forest Day celebrated?

March 17 is celebrated as the World Forest Day.

✚ What are the five types of landforms?

○ Mountains, forests, Farmlands, Desert and Sea

Secondly, the members of yellow team presented their PPT on their research topic '**Water**'. The topic was introduced by B.Abhirami, the leader of yellow team. The slides containing details about the science of water and the anomalous properties of water were brought into point of view by J.M.Mereshiya, the co-leader of yellow team. She also explained about the surface tension. Leena put the concept of water cycle and aquatic eco system in her own words. The global water scenario was elucidated by A.Malavika. Vidhya spoke on the topics global and national water crisis. J.S.Edin Jijo made us to know about the sustainable water system and the steps to avoid water wastage. The ways to prevent water pollution was also explained by him. Vishal verbalized the causes of water and air pollution. Argineshiya said about water scarcity and the steps to overcome it. Vijayaraj expounded the impacts of climate change. The global water instability and conflict was put into words by the co-leader of the team. Raghul gave details about green building and water footprints along with its components. Water stewardship was brought into point of view by Immaculate Rishvi. The presentation was winded up by the leader of the team by 12:20 pm.

The maroon team members got the chance of presenting their presentation followed by the yellow team. The research theme of the team was '**Sustainable agriculture**'. A laconic introduction about agriculture and sustainable agriculture was given by me, the leader of maroon team, R.J.Reshma. The needs for sustainable agriculture were expounded by R.J.Jenisha. The concept why sustainable agriculture? was portrayed by S.Abila. S.J.Shifi described the ancient agricultural practices. Followed by her, the modern agricultural practices were told by R.Kowsanth Kalidas. The latest innovations in agriculture and livestock in agriculture were explained by X.M.Mary Sushmija. S.Sanjana made a differentiation between the ancient and modern agriculture. The concept of green revolution was put in words by K.K.Prabin Kumar. S.Dani Rovas, the co-leader of maroon team explicated the impacts of agricultural practices in sustainability. The steps to bring sustainability in agricultural was brought into point of view by me, R.J.Reshma. Sustainable agricultural practices and missions were said by K.R.Aruna. The sustainable initiatives by India were said by J.M.Jereshea. She concluded the presentation by saying "**There is no culture without agriculture**" and so we should try practising sustainable agriculture for good environmental health and profit. Queries were asked.

✚ Name some revolutions which occurred in the field of agriculture.

- Green revolution – increase in production of crops
- Blue revolution – increase in production of marine animals
- White revolution – increase in production of dairy products
- Yellow revolution – increase in production of oil seeds

✚ In which type of soil is rice grown?

Alluvial soil is used to grow rice.

After this session, we had lunch break. By 2:05 pm, the green team presented the research topic PowerPoint on the topic '**Energy**'. The leader of green team, Gby Atee gave a concise prologue about energy and its two types- renewable and non-renewable. The uses of energy were emphasized by Srinidhi. Ayana Treesa Raj put the slide about issues of surrounding energy use and production in her own words. J.Jisfia Shifani gave a clear cut idea about fossil fuels. Haritha spoke about conserving energy and the initiatives taken by the government. Sree Ram expounded about the increasing energy efficiency. Ashwin put forward few points about energy access. Kaviya Shree explained the technologies for bringing sustainability in using energy. Alternate energies for transportation sector were said in points by Shruthikrishna. Soorya Vijay elucidated few energy sources for more sustainable future. Gby gave a brief idea about the evaluation and depletion of basic and common sources of today like oil, natural gas and coal. Ageesha made us clear about the initiatives taken by the government. Srinidhi concluded the presentation by saying "**Man has everything for his need but not for his greed**". Questions were raised regarding the grid system and World Energy Conservation Day.

Last but not the least, the members of blue team gave a presentation on their research topic '**Technology**'. S.Dani Rovas gave an epigrammatic preface to the term technology. Jefin R.Wensely, the leader of blue team explained about the technological system and the uses of technology along with its benefits. The term sustainable technology was introduced and explicated with its advantages and disadvantages by the co-leader of blue team, Shalomi. Shyam Sagar elucidated about the eco-friendly technology. The term design for manufacturing was expounded by Rudra Sathish. The concept of zero emission was put in words by Meera Subramanian. Seanna spoke on the topic Restriction of Hazardous Substances (RoHS). S.S.Akshaya gave details about recycling. Aglin Bala listed the steps to implement sustainable technology. Naveen Jith explained about the green technology including green building and design. Then the presentation was continued by Shamini and Ashmi. Followed by them, Jefin concluded the presentation.

Finally, Dr.A.Jayalal gave few remarks about our presentations. He expected us to bring solutions for all the problems. Shri. John Rabikumar, Shri.L.Edwin Sam, Mrs.Sujatha, Mrs. Margaret, Mr.Winifred and Er.A.Benzigar Rajan gave us few suggestions to improve our presentations. The vote of thanks was proposed by Gby. The meeting was winded up with the National Anthem by 4:00 pm. This programme gave me more self- confidence and taught me how to do presentation fearlessly. I thank KAP and Annammal College of Nursing, Kuzhithurai for providing me this rare opportunity.

THANKS TO KAP.....