Charutar Vidya Mandal's
NATUBHAI V. PATEL COLLEGE OF PURE AND APPLIED SCIENCES




**INSIDE THIS ISSUE:**





## From the Chief Editor's Desk

**By: Dr. Basudeb Bakshi**

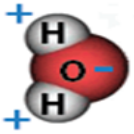
I am pleased to welcome the second issue of our biannual News Letter SPECTRUM- *The Measure of Progress*. This issue of 'Spectrum' is intended to explore the scientific talents of our students and faculties. I feel proud and privileged to release this issue and would like to acknowledge the kind support and encouragement of all those who contributed directly or indirectly to bring the Newsletter out. It is really heart warming to put together all these expositions. I feel glad to express my considerable appreciation to all authors in this issue. I firmly believe that this issue of Spectrum will not only make some interesting reading it will set a tradition to see the reflection of the continuous progress of our budding brains too. The Editorial Board would like to express its deepest gratitude to Dr C L Patel, Chairman, Charutar Vidya Mandal (CVM) for his keen interest and support.

I congratulate the editorial team for making *spectrum* inventive and innovative.
Thank you all!!

## Water : THE ELIXIR OF LIFE

**By: Dr. Smita Srivastava**

Man has through the ages sought in vain for an imaginary elixir of life, the divine amrita, a draught of which was thought to confer immortality. But the true elixir of life lies near our hands. For it is the commonest of all liquids, PLAIN WATER!.. This common substance which we take for granted in our everyday life is the most potent and the most wonderful thing on the face of our earth. It is the basis of all life. In a landscape it may be compared to the eyes in a human face. Although the most common of liquids, it is also the most uncommon of liquids with amazing properties which are responsible for its unique power of maintaining animal and plant life. But it's not at all simple and plain and it is vital for all life on Earth. Where there is water there is life, and where water is scarce, life has to struggle. As rightly said by Leonardo da Vinci - "Water is the driving force of all nature." Water makes most of earth's surface and most of our human bodies … but do we really know the secrets of this amazing element. From agriculture, to factories and hydropower, we put water to work in a million different ways every day. And yet water acts outside all known physical laws of nature.




### FACTS AND FIGURES ABOUT WATER

**Water Properties**

- Weight: 62.416 pounds/cubic foot at 32°F; 1,000 kilograms/cubic meter
- Weight: 61.998 pounds/cubic foot at 100°F; 993 kilograms/cubic meter
- Weight: 8.33 pounds/gallon; 1 kilogram/litre

Density: 1 gram/cubic centimetre (cc) at 39.2°F, 0.95865 gram/cc at 212°F

**Some water volume comparisons:**

- 1 gallon = 4 quarts = 8 pints = 128 fluid ounces = 3.7854 litres
- 1 litre = 0.2642 gallons = 1.0568 quart
- 1 million gallons = 3.069 acre-feet = 133,685.64 cubic feet

**Flow rates**:
1 cubic foot/second (cfs) = 449 gallons/minute = 0.646 million gallons/day = 1.98 acre Feet/day

### THE WATER IN YOU

***Water is of major importance to all living things***;

- Up to 90% some organism's body weight comes from water.
- Up to 60% of the human adult body is water.
- The brain and heart are composed of 73% water, and the lungs are about 83% water.
- The skin contains 64% water, muscles and kidneys are 79%, and even the bones are watery: 31%.
- An adult male needs about 3 litres per day while an adult female needs about 2.2 litres per day.

***Water serves a number of essential functions to keep us all going***:

- A vital nutrient to the life of every cell, acts first as a building material.
- It regulates our internal body temperature by sweating and respiration
- The carbohydrates and proteins that our bodies use as food are metabolized and transported by water in the bloodstream;
- It assists in flushing waste mainly through urination
- Acts as a shock absorber for brain, spinal cord, and fetus
- Forms saliva
- Lubricates joints

### WATER - THE "UNIVERSAL SOLVENT"

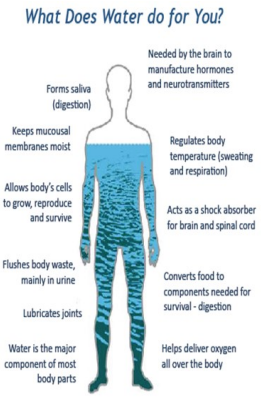
Water is capable of dissolving a variety of different substances. It means that wherever water goes, either through the air, the ground, or through our bodies, it takes along valuable chemicals, minerals, and nutrients.

Water is called the **universal solvent** because more substances dissolve in water than in any other chemical. This has to do with the polarity of each water molecule. The hydrogen side of each water ($H_2O$) molecule carries a slight positive electric charge, while the oxygen side carries a slight negative electric charge.

This helps water dissociate ionic compounds into their positive and negative ions. The positive part of an ionic compound is attracted to the oxygen side of water while the negative portion of the compound is attracted to the hydrogen side of water. Water can become so heavily attracted to a different compound, like salt (NaCl), that it can disrupt the attractive forces that hold the sodium and chloride in the salt compound together and, thus, dissolves it

**Why salt dissolves in water**

At the molecular level, salt dissolves in water due to electrical charges and due to the fact that both water and salt compounds are polar, with positive and negative charges on opposite sides in the molecule. The bonds in salt compounds are called ionic because they both have an electrical charge—the chloride ion is negatively charged and the sodium ion is positively charged. Likewise, a water molecule is ionic in nature, but the bond is called covalent, with two hydrogen atoms both situating themselves with their positive charge on one side of the oxygen atom, which has a negative charge. When salt is mixed with water, the salt dissolves because the covalent bonds of water are stronger than the ionic bonds in the salt molecules.




The positively-charged side of the water molecules are attracted to the negatively-charged chloride ions and the negatively-charged side of the water molecules are attracted to the positively-charged sodium ions. Essentially, a tug-of-war ensues with the water molecules winning the match. Water molecules pull the sodium and chloride ions apart, breaking the ionic bond that held them together. After the salt compounds are pulled apart, the sodium and chloride atoms are surrounded by water molecules, as this diagram shows. Once this happens, the salt is dissolved, resulting in a homogeneous solution.

# NSS—The Youth Empowering Tool

(Motto — 'Not Me But You')

**By: Dr. Yogesh Patel**

National Service Scheme, popularly known as NSS, was launched in Gandhiji's Birth Centenary Year - 1969. The scheme has been governed by Ministry of Human Resource Development of Central Government of India. NSS aims at providing appropriate training and practical knowledge regarding community services to the students of schools and colleges. It also endeavours to develop values and virtues like leadership quality, public speaking, personality development, community living, communal peace and harmony and thereby cultivates in youth awareness for disaster management, love and sacrifice for the nation etc. After completion of 50 years of NSS implementation, some modifications are required in the objectives of NSS as per the need and demand of the present society. I believe that the NSS volunteers and program officers from science stream have more responsibilities towards society and nation as a whole as compared to students of other academic streams. The only reason I believe behind this is if we fail to channelize the young potential of our country towards positive and constructive side than the dream of our ex-president late Dr. A. P. J. Kalam depicted in his book 'Mission - 2020' will not be achieved. We have been facing problems like negative role of print and electronic media in reporting various news, misuse of social networking sites or cyber crime, glorious depiction of violence and sex in Indian movies and so on. These attributes have direct effect on the minds of our young generation which lead our youth in the wrong direction. Resultantly, the hope of nation gets demolished in its initial stage.

Organizing NSS activities can be a prime solution to these kinds of crucial evils. Each NSS unit has a wide range of opportunities to work for aforementioned human problems. The routine activities organized earlier were cleaning of the village, deepening of village ponds, blood donation camp, AIDS awareness programme, vaccination etc. But in the present era NSS needs some novel projects and innovative practices that can enable our students to be the proficient civilians of one of the most powerful nations in the world. During my tenure of seven years as an NSS Programme Officer at NVPAS, I invented many innovative projects that proved to be successful and brought my college pride and prestige. Of course, this could not have been feasible without motivation and support of the Principal and the faculty members of my college. Mentioned below are some of the examples.

**Anti-Tobacco Cell**: The mission of this cell is to make our campus tobacco-free. We made all the staff members to take an oath that prohibits consumption of tobacco in any form. We organized a Poster Exhibition on "addiction Eradication' at Shapurji Hall of Charutar Vidya Mandal, V. V. Nagar on 25th November 2014 wherein First Year students of the college and students of CVM Schools participated. Nearly 150 posters were exhibited and more than 300 students of schools visited the exhibition.

We also organized a rally and performed street plays during the Annual NSS Camp organized at Dahemi village of Borsad district from 5th Jan. to 11th Jan. 2015 and oriented the villagers about socio-economic harms caused due to consumption of tobacco.

**Knowledge Sharing Forum (KSF)**: This forum aims at providing a platform to the students to share their knowledge that they gain from their extra-curricular reading and thereby helping them in cultivating their presentation skills.

**Gyandhara**: This innovative practice has been invented and implemented with a view to provide extra coaching to the needy students of slum areas. Our students visit these areas at regular intervals for this purpose. Our motto is to decrease the dropout ratio at the school level and thereby fulfilling our moral social responsibility of helping the government in their noble mission.

We also organize variety of activities like street play, exhibitions, rallies, seminars and presentations to spread awareness regarding gender sensitization, female foeticide, celebrating festivals in eco-friendly way, global warming, prevention of Thalassemia and other such relevant issues.

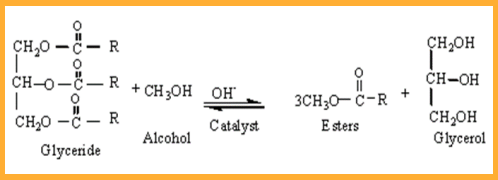
In a nutshell, youth is like a reservoir of infinite power but we need to show this youth the direction in which they can utilize their potential. To keep on blaming the youngsters for wasting their time in futile activities is not the only activity we are supposed to do. As a teacher and an NSS programme officer I firmly believe that still there is hope. NSS has an immense scope for channelizing the youth potential in creative activities and thereby keep them away from all social evils. We need to nurture our budding youth, if we truly want to contribute to the progress of the nation.

Vande Mataram,

# A CLEANER FUEL: BIODIESEL

**By: Dr. Archana Shah**

Non renewable sources of energy like petrol, diesel and others are limited and will come to an end so we must think for an alternative source. Biodiesel can be an alternative as it is produced from renewable resources (oil crops generally used are soyabean, rapeseed, palm, jatropha, waste oil etc.) and has lower emissions compared to petroleum diesel. It is less toxic than table salt and biodegrades as fast as sugar. Jatropha oil has been used in India for several decades as biodiesel for the diesel fuel requirements of remote rural and forest communities; jatropha oil can be used directly after extraction (i.e. without refining) in diesel generators and engines. Now a days, biodiesel is America's advanced biofuel due to its good quality . Domestic production with natural resources and its use decreases our dependence on imported fuel and contributes to our own economy.




Biodiesel is produced from any fat or oil through a refinery process called transesterification.

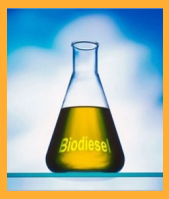
There are three basic routes to biodiesel production from oils and fats:

1. Base catalyzed transesterification of the oil.
2. Direct acid catalyzed transesterification of the oil.
3. Conversion of the oil to its fatty acids and then to biodiesel.

Almost all biodiesel is produced using base catalyzed transesterification as it is the most economical process requiring low temperatures and pressures and producing a 98% conversion yield.

In transesterification triglyceride (fat/oil) reacts with alcohol to form esters and glycerol. A triglyceride has a glycerine molecule as its base with three long chain fatty acids. The characteristics of the fat are determined by the nature of the fatty acids attached to the glycerine. The nature of the fatty acids can in turn affect the properties of the biodiesel. During the esterification process, the the fatty acids of triglyceride reacts with alcohol in the presence of a catalyst, usually a strong alkali like sodium hydroxide to form the mono-alkyl ester, or biodiesel and crude glycerol. In most production methanol or ethanol is the alcohol used (methanol produces methyl esters, ethanol produces ethyl esters) and is base catalyzed by either potassium or sodium hydroxide. Potassium hydroxide has been found to be more suitable for the ethyl ester biodiesel production.

Biodiesel is defined as mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats which conform to ASTM D6751 specifications for use in diesel engines. Biodiesel refers to the pure fuel before blending with diesel fuel. Biodiesel blends are denoted as, "BXX" where "XX" represents the percentage of biodiesel contained in the blend (ie: B20 is 20% biodiesel, 80% petroleum diesel). Biodiesel is the only alternative fuel to have safeguards against the health effects testing requirements of the Clean Air Act. The use of biodiesel in a conventional diesel engine results in substantial reduction of unburned hydrocarbons, carbon monoxide, and particulate matter compared to emissions from diesel fuel. In addition, the exhaust emissions of sulfur oxides and sulfates (major components of acid rain) from biodiesel are essentially eliminated compared to higher sulfur diesel.




1. Particulate matter dropped by almost half when using B100 (100% biodiesel), and by 12 percent when using B20 (20% biodiesel).
2. Global warming impact from $CO_2$ dropped by almost 80 percent using B100.
3. Hydrocarbons were reduced by nearly 70 percent using B100 and 21 percent using B20. Hydrocarbons include many different individual toxic compounds.
4. Carbon monoxide decreased 48 percent with B100, 12 percent using B20.

One of the great advantages of biodiesel is that it can be used in existing engines, vehicles and infrastructure with practically no changes. Biodiesel can be pumped, stored and burned just like petroleum diesel fuel, and can be used pure, or in blends with petroleum diesel fuel in any proportion. Biodiesel can be a healthier preference over petroleum oil and diesel for future generation.

# It's time to Revolutionize Thalassemia Treatment

**By: Partth R Thakur (TYBSc-BT)**

***The following article is to generate public awareness and research aptitude.***

*The secret of change is to focus all of your energy, not on fighting the old, but on building the new - Socrates*

Our red blood cells carry haemoglobin, a protein which carries the oxygen we breathe in through our lungs and transports it to the rest of the body. A spongy material inside some of our bones – Bone Marrow - uses iron that our body takes from food and makes haemoglobin. The bone marrow of people with Thalassemia does not produce enough healthy haemoglobin or red blood cells, which causes anaemia and fatigue, because the body is short of oxygen. In more severe Thalassemia cases, the patient's organs may be damaged; there is restricted growth, heart failure, liver damage, and even death. People often classify Thalassemia as a Disease but I beg to differ here. If you study it closely it's more like a syndrome. Children are diagnosed with it early in the life usually by the time they are 6 to 8 months old. Once diagnosed, they require blood transfusions every 15 to 25 days which is decided on the basis of individual patient's condition. We have been doing well curtailing and preventing the number of such patients by proper pregnancy testing and genetic counselling, post or pre-marriage but what about the existing patients? Or what if the testing or counselling is sidelined in some cases and yet again a Thalassemia Major Patient is born. The current techniques and medications are mediocre and simply help to prolong life of such patients rather than actually solve the problem. The primary problem associated with Thalassemia is the deposition or accumulation of Iron on body organs like Liver, Spleen, Heart and various other joints of the body. If you look closely the medications and their side effects eventually itself form a viscous loop to which the patients succumb and die. It's really disappointing if the solution of one problem is resulting in others.

**Iron Chelation:** Elaborating more on the current treatments, primarily all Thalassemia Patients require iron chelation to survive past the age of usually about 3 years. Excess iron received in form of food is ultimately deposited over various organs in the body thereby increasing chronic iron overload. The current medicine includes a chelating compound Desferasiox or Defrijet which chelates the iron and is given out through the urine or stool output. The urine or Stool of such individuals appears orange or red in colour due to the chelated iron. However treatment by Desfarasiox or Defrijet has many disadvantages and regretfully be even called 'close to a cure' of Thalassemia Major. It may often lead to The effects have been classified as Rare, Common & Very Common.

Renal Failure or Depression in renal activity (Common)
Auditory hearing loss (Rare)
Retinal Disorders and reduced functioning of Eyes (Rare)
Gastrointestinal Irritation and ulcers (Common)
Skin Rashes , Vomiting and abdominal pain (Most Common)
Cytopenia and Neutropenia (Common)
Hepatic Failure (Common)

Patients are hence affected directly or indirectly by either of the above mentioned effects which down scales their overall health. No doubt, the only reason why all the patients are surviving today is because of this drug. It is a novel therapy and an immediate solution but it mustn't be allowed in long run unless it can be stripped of from at least some of its disadvantages. It must be made clear that were doing nothing but prolonging a few years irrespective of how the outcome maybe.

**Venous Thrombosis:** Now comes something that is not usually detected or recognized in thalassemia patients yet it is one of the biggest problems that still lacks a solution. Venous Thrombosis or commonly called as Thrombus is a state in a patient when he/she starts showing increased clotting activity in veins after repeated transfusions. It is very much like a chain reaction where in one site contributes to thrombosis at another site. This ultimately results in clots which may take up to 6-9 months to dissolve completely.

As mentioned earlier, Thalassemia patients require blood transfusions every 15-25 days. The blood is much obviously administered intra-venously and hence patients showing Thrombosis often lack receptive veins in their body thereby making it unable to transfuse blood into their body easily.

**Conclusion:** If it's not making you better, it isn't medicine. Medicines are supposed to make you more of a normal individual, not less. The average life of a Beta-thalassemia patient is 17 years currently.

# ASTHMA: A MAJOR CHRONIC INFLAMMATORY DISORDER

**By: Krishna Patel (TYBSc-MI)**

Most of the disease burden in rural India is due to the respiratory disorders namely Asthma, Bronchitis, Tuberculosis (TB) and Pneumonia. In low resource settings these diseases are mainly attributed with exposure to indoor pollution, solid cooking fuels, poor housing, low nutritional status and sanitary conditions. The association of respiratory disorders with geographical region may be relevant with population density, industrial and textile pollutants and tobacco consumption. Asthma, a complex chronic inflammatory disease of lower airways affecting people of all ages. It is also defined as a chronic obstructive pulmonary disease, characterized by a hypersensitivity of the airways. Approximately 300 million individuals are currently suffering from asthma world wide and 10% of them i.e. 30 million are in India. The prevalence of asthma varies in different age groups. It ranges from 3 to 38% in children; 2 to 12% in Adults. The annual death rate to asthma is estimated to be 250,000 and the majority of the death occurs in low and middle income countries. Common symptoms of asthma include difficulty breathing with wheezing and coughing, feeling of tightness in the chest, copious production of mucus, apprehension and increased heart rate. Sometimes asthma is divided into extrinsic and intrinsic asthma. Extrinsic asthma is mainly due to allergens, be they airborne or from food. Resulting immune reactions release inflammatory compounds that cause spasms of the bronchial tubes. Allergy is a likely cause of asthma in about 90 per cent of children with asthma and about 50 per cent of affected adults.

Intrinsic asthma is not due to allergies, and may come from microbial infestations, emotional factors, and mucus congestion from other causes.

With asthma we usually see three sets of biological symptoms:

1. The airways become obstructed due to bronchial spasms
2. The bronchial walls become inflamed and swell with further narrowing of the airways
3. Additional airway obstruction is caused by copious amounts of thick, tenacious mucus

During an attack these symptoms are triggered and result in an acute shortness of breath. Because in this situation it becomes easier to inhale than to exhale the lungs may become hyper-inflated. Asthma, especially in older individuals (over 55) is also associated with a doubled risk of other diseases such as heart disease, stroke, diabetes, cancer, arthritis and osteoporosis.

There is a twenty-fold difference between the highest and lowest rates in the world. The lowest prevalence rates are found in Indonesia, Albania, Romania and Georgia while the highest are in the United Kingdom, New Zealand, Australia, Ireland and India. “The cause of asthma is not known, but there is evidence that many factors play a part”, and then goes on to list the following causes:

**Genetic factors**: asthma tends to run in families, and many people with asthma also have other allergic conditions.

**Environmental factors**: in wealthy, hygienic Western countries most babies are not exposed to bacterial infections that "kick start" the immune system in early life and direct the immune system away from allergic responses. This makes them allergic to house dust mites, tobacco smoke, animals, pollens moulds and dust.

**Dietary changes**: changes in diet in Western countries, such as a high proportion of processed foods, a higher salt intake, a lower antioxidant intake and a lack of fresh oily fish.

**Lack of exercise**: spending more time inside in front of the television means that children get far less exercise.

**Occupational exposure**: in adults, asthma can develop in response to irritants in the workplace - chemicals, dusts, gases, molds and pollens.

**Medical Asthma Treatment**

The medical profession regards asthma as incurable, although children may spontaneously “grow out of it”. Therefore, medical treatment of asthma is purely symptomatic and consists mainly of anti-inflammatory drugs and bronchodilators. Most commonly used as anti-inflammatories are corticosteroids. These drugs reduce swelling and mucus production in the airways, making them less sensitive and less likely to react to triggers. Other anti-inflammatory drugs are called Leukotriene modifiers and Mast cell stabilizers.

Bronchodilators relieve asthma symptoms by relaxing the muscle bands that tighten around the airways. This quickly dilates the airways, and makes it easier to breathe. It also helps to clear mucus from the lungs because as the airways open mucus moves more freely and can be coughed out more easily. Bronchodilators include mainly short acting beta-agonists, and in addition Anticholinergics.

These drugs can be administered in different ways. These include a metered dose inhaler, dry powder inhaler, or a nebulizer, or taken orally, either in pill or liquid form. Most or all of these asthma drugs can be expected to cause increasing health problems with long-term use. The worldwide asthma statistics clearly show the inadequacy of this drug-based medical approach.

# A common misconception
# We use only 10% of our Brain

**By: Dhaval Bhatt (TYBSC-BT)**

We hear many statements day to day about science and its findings. Some are so widespread and integrated that they are much accepted even without some back tracing of facts and figures and its origin. One of them is –"Humans use only 10% of Brain". Well, the percent varies individual to individual, some say 1%, 20% and even only 0.01% of brain.

In fact, this statement is complete hokum with no apparent solid research or findings. No scientists, neurologist, biologist, doctors or even brain experts have stated this. The reality is that we use 100% of our brain, irrespective of gender or age.

To support this "100%" figure, scientists sure have done some research and came to some logical arguments and conclusions. The following points shows why we use our full brain:

1. Brain scans like CT scan, MRI, Brain PET scan have shown that no matter what one is doing, all brain areas are always active. Some are more active than others but there is no part of brain that is actually not functioning.
2. Even by this scans we have found that the brain shows a little activity in sleep also. So, the functioning of brain is continuous.
3. The brain is 3% of average body weight but uses more than 20% oxygen and energy of the total intake for its proper function. So if humans used only 10%,the process of natural selection in all this several years of evolution would have eliminated the other 90% 'inefficient' brain.But that is not the case. In fact, our brain size has increased over this evolution.
4. If a large fraction of brain is unused as stated, we can stay healthy and alive if the unused part is removed by lobotomy(surgically removing part of brain).But again, that is not the case.
5. Same is when we suffer even a slight physical brain trauma or damage. This result in loss of various abilities and can have a profound effects. If the "10%" misconception is true, the damage should not impair performance.
6. Our brain does many functions which are very long to list. Some are done voluntarily and other involuntarily but brain is needed. Our 5 senses, along with other senses like pain, hunger, thirst, balance, our thinking, reading, understanding things, reflexes, muscle movement and numerous others to point. This diverse amount functions cannot be performed only by 10% as this would be understatement.

Our brain is the most amazing organ and we are studying it for years and still it is unbelievable for its functions and working. This itself shows that we should not underestimate or demean the potential of it to 10% or some other fractions. But the question is how this urban legend got widespread without much opposition?

The possible origin can be traced back to 1980s.Harvard psychologists William James tested the theory and research in the accelerated raising of a child prodigy. This baffled him and all he said was that some people meet only a fraction of their full potential. Some years later, a renowned astrophysicist Albert Einstein said that we use a limited part of our brain. This statements were misattributed and extrapolated by media, advertisements, newspapers and thus accepted widely. Many faces many stories.

In conclusion, it is important that we do not underrate our brain but try to question radically the truth behind this. Also the figure 10% is nothing but a myth. But it is meant to say our thinking should be expanded along with creativity, imagination and logic.

# Sony BRAVIA TV line-up meets Android

**By: Kishan Saspara (MSc-IT Sem-5)**

**Introduction to Sony’s Android TV**

Sony’s Android TV uses the official Google Android OS - 5.0 version, offering a variety of TV apps from the Google Play Store. Customers can now experience the ultimate gaming thrill with their favorite games and app, which are specially optimized for the TV screen size. Gaming enthusiasts can connect their game pads and indulge in superior gaming experience on Sony’s Android TV.

Sony’s Android TV excels in uniqueness and comes with exclusive Sony features like Serial Abtak and Notify BRAVIA. The new models range from 43 inch to 75 inch and include 5 new series with 13 new models.

**Key features**

**Serial Abtak:** Sony’s exclusive Catch-Up TV app allows viewers to watch their favourite TV serials anytime from a wide variety of National & Regional channels. One can create a personalised playlist by adding serials as favourites for quick access. The feature also allows easy navigation to watch serials by channel, episode or even language.

**Notify BRAVIA:** An exclusive app from Sony that offers uninterrupted TV viewing experience. Customers can download Notify BRAVIA app from Google Play Store on their smart phones. This allows the TV to notify the customer if he gets a call, sms, email or any other notification on the Smartphone. The additional privacy setting makes this feature even more unique as viewers can control the information they want to display on their TV screens.

**Voice Search:** Voice function on Android TV allows customers to not only search for content across different services but also answer general questions using the most sophisticated search engine from Google. Customers can command their TV so they can spend less time browsing and more time watching. The Voice Search feature is available through a remote equipped with a microphone.

**Google Play Store:** By using their Google ID, customers can discover games, movies, TV shows and more from Google Play Store. They can also enjoy many familiar apps on their Smartphone and have seamless content playback between devices.

**Google Cast:** Thanks to the built-in Google Cast™, customers can easily cast their favorite content from their Smartphone, tablet (Android, ions) and laptop PC (Windows) directly onto the large Sony TV screen. Customers can also multi-task and operate actions such as check SNS, web and more with their Smartphone’s.

**One-Flick Entertainment**: This App allows customers to access content quickly and intuitively without any disturbance while watching TV. Customers can simply flick to find TV & internet videos, apps, photos and other content, quickly and intuitively. They can find their favorite content instantly with quick TV start-up and speedy app launch.

**Connectivity with Accessories:** Sony Android TV can be connected with third party accessories like Gamepad for the ultimate gaming experience; keyboard for smooth internet browsing; Smartphone or smart watch for controlling TV operations.

The newly launched BRAVIA TVs will be available at all Sony Centers and major electronic stores across India.

# WINDOWS 10 Operating System

**By: Chandni Thakkar (MSc-IT Sem-7)**

Windows 10 is so familiar and easy to use; you'll feel like an expert. The Start menu is back in an expanded form, plus it has brought over your pinned apps and favorites so they're ready and waiting for you.

It starts up and resumes fast, has more built-in security to help keep you safe, and is designed to work with software and hardware you already have.

This combines the strengths of Windows 8 with Windows 7.

**Millions of people are already using Windows 10**

The Windows Insider Program is a global community of fans who love Windows and want to help make it better. Insiders see the operating system in its earliest stages, and play a role in shaping it. Their feedback has contributed to the best Windows ever.

**The web that works the way you do**

Windows 10 comes with Microsoft Edge, an all-new browser that's built to give you a better web experience. Write or type notes directly on web pages and share them with others, read online articles free of distraction and save your favorite reads for later access and with Cortana enabled, you get instant access to key actions – like making reservations or reading reviews – without leaving the page that you're on.

**Windows Store is your one-stop shop**

Introducing the new Windows Store, a unified shopping experience across every Windows 10 device. Browse the store on your PC, tablet or phone and easily purchase great digital content including apps, games, music, films and TV shows.

**The best screen is always the one you're on**

Windows 10 enables your apps to look and work great in all modes, on all devices. On 2-in-1 devices, your screen can be optimized to work with touch or keyboard and mouse.

**An at-a-glance view of what matters most**

Customize your Start menu by pinning just about anything—including apps, people, and playlists—for easy access to the things you use most. Showcase tiles let you jump right into your content without having to first go open the app.

**Multi-doing helps you get to "done" faster**

Easily snap up to four apps in place and see all open tasks in a single view. You can even create virtual desktops when you need more space or want to group things by project. This Windows will definitely blow the other Windows versions like the water.

# ENVIRONMENTAL AUDITING: MILEPOSTS, STANDARDS AND CAREER OPPORTUNITY

**By: Khushboo Pandey (TYBSc-ES)**

***INTRODUCTION***

Any industry affects the environment directly or indirectly all the time. But if any industry wants to increase his profit by neglecting the adverse impacts of pollution generated on health and safety requirements, then it results in accidents or hazards which we have seen many times in our history in different parts of the world. If we try to look at these accidents, then we will find that all the companies involved in these accidents were large corporations and were aware of many environmental issues related to their organizations. In all cases poor planning, lack of contingency planning, and little awareness of the impact of catastrophic failures upon the local environment resulted in disasters, which caused severe damage to environment and human health. Due to these incidents pressure was built up on organization to improve their environment performances which lead to development of environmental auditing.

Environmental auditing is defined as management tool comprising of a systematic, documented, periodic and objective evaluation how well environmental management and equipment's are performing in an organization. An environmental audit tries to assess and establish the degree of compatibility to the environment improvement. It has numerous benefits and can be employed to reduce liability for any organization, reduce cost of waste management and handling input cost, enhance credibility with the public, increase awareness and commitment in the employees to strengthen environment practices etc.

Environmental auditing can be done according to different areas and purposes such as Management Audit, Environmental Management System (EMS) Audit, water Audit, Waste Audit, Due Diligence Audit, Pollution Prevention Opportunity Audit, Material Balance Audit, Regulatory Compliance Audit etc. It can be done in five phases:-

- Audit planning phases.
- Pre-audit phases.
- Audit phases.
- Post-audit phase and
- Audit follow-up.

Effective environmental lagging aspects can lead to satisfied level of compliance and reduce risk to human health and environment.

***MILEPOSTS***

Since time immemorial, environmental protection has been the integral part of society in almost every civilization. Many religious practices like worshipping of trees, rivers, mountains etc. give rise to attachment to the environment. We know that initial technological development leads to the industrial revolution which brought a scenario where social belief of good environmental practices have been overlooked and efforts towards environmental protection seems missing. Apart from these other problems arose like environmental accidents and disasters. So the search of effective tool to identify the potential hazard or point of lapse gave birth to environmental audit.

By the early 1970s, industries operating in North America and Great Britain gathered information related to environmental auditing but practice was not same for each auditor due to lack of standards. First independent environmental audit was done by Arthur D' little in 1977 for the allied chemical Company due to a serious environmental incident which took place at one of the Allied's plant. Based on the audit Findings the Allied Chemical Company formulated auditing program for all its units.

In 1982, environmental auditing roundtable was founded which was largest and oldest North American Association of environmental auditors. After that in 1984 Arthur D' little published a book "principles for conducting environment, health and safety audits". In the same year U.S. Environmental Protection Agency (E.P.A.) issued" Federal Facility Compliance Strategy" and it was revised in 1988. These documents are popularly known as "yellow books".

The industries operating worldwide had a feeling that their operations were safe to environment and environment, health and safety risks were minimized. But this confidence was blown out by the Bhopal Gas Disaster, where thousands of people died as a result of leakage of deadly methyl-isocyanate gas at the Union Carbide Factory in Bhopal. This chapter had changed the thinking of the business organization, policy makers, governments and mass at large. Initially the companies of North America and Europe blamed the Indian regulatory standards but there were more incidents happened later in their units also. Till 1984 before Bhopal Gas Disaster in India, the environmental audits were used for ensuring compliance to regulations and cost saving, but after the incident Safety, Health and Environment were also included.

In 1986 U.S. E.P.A. announced "Environmental Auditing Policy Statement", on July 9, 1986 which is known as "1986 Audit Policy". It describes the use of environmental auditing to achieve compliance with laws and regulations and help to correct environmental violations. Subsequently in 1988 International Chamber of Commerce issued position paper on "Environmental Audit" and "Guide to Effective Environmental Auditing" in 1991.

The most remarkable milestone in the field of environmental auditing may be seen in the year 1995. When U.S. E.P.A announced "Incentives for self –policing: Discovery, Disclosure, Correction and Prevention of Violations", on December 22, which is known as 1995-Audit Policy. In India the preliminary form of environmental auditing had been started with announcement of Environment Protection Rules in March 1992 where all these industries were required consent to operate under Water (Prevention and Control of Pollution) act -1974, and Air act or authorization under Hazardous Waste Management & Handling Rules 1989, are supposed to submit an annual Environment Statement in the prescribed Form- V, specified Amendment & Rules, 1992.The effective environment audit was started from 1996 when ISO-14000 standards were implemented.

***ENVIRONMENTAL AUDITING STANDARDS***

Most common environment standards were adopted for environmental management system of an organization i.e. ISO- 14001. International organization for standardization (ISO) started working in ISO – 14001, standards for Environment Management System, in 1993 and first standard came out in the year of 1996 by Technical committee (ISO/TC) No. 207. These ISO – 14000 standards are descriptors for a set of standards that have been developed in response to global concern about the environment. These standards represent a consensus agreement by national standards bodies around the world which helps to follow the procedures in the establishment of an effective environmental management system.

***CAREER OPPORTUNITY***

To become an environmental auditor at least undergraduate or post graduate degree is needed related to the following fields:-

- Environmental Science
- Environmental Management
- Natural Resource Management
- Environmental Engineering
- Environmental Assessment

Since, Environmental knowledge is not restricted to a single field; it is a multi-disciplinary approach which requires knowledge of various disciplines to understand the effects of particular activity in specific situation in the environment. So the environmental auditor must have similar type of knowledge and skills. She/he must have knowledge of environmental interaction, legal requirements and technical understanding of process under the audit. Before being an auditor, a person has to undergo certain trainings, which will improve the analyzing skill. Following institutions in the India are involved in a training related to environmental audit:-

National Institute of Training for Standardization (NITS), Noida, UP.

International Centre for Environment Audit and sustainable Development (ICED), Jaipur, Rajasthan.

A trained and qualified environmental auditor needed for an efficient auditing. So realizing the need to ensure quality, some organization has been registered the auditors with required qualification, training, experience etc. Some of the registrations of environmental auditors are:-

The Institute of Environmental Management & Assessment (IEMA), UK.

The Board of Environmental, Health & Safety Auditor Certification (BEAC), Florida, USA.

The institute of internal auditors (IIA), Florida, USA

International Centre for Environmental Audit And Sustainable Development (ICED), Jaipur, Rajasthan.

Different institutions have different eligibility criteria and requirements for certifications, depending on that a person can apply after getting specified degree and training.

For IEMA Environment Auditor registration one can apply to one of the general Environmental Auditor levels as an Associate, Registered or Applications are assessed by IEMA using points systems. Points are awarded based on academic qualifications, membership of professional bodies, training and experience.