# Water Power

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Class: 11

# Introduction:

**Natural Resources** are all that exists without the actions of humankind. This includes all natural characteristics such as magnetic, gravitational, and electrical properties and forces. On earth we include sunlight, atmosphere, water, land (includes all minerals).

Natural resources are materials and components (something that can be used) that can be found within the environment. Every man-made product is composed of natural resources (at its fundamental level). A **natural resource** may existing an alternate form which must be processed to obtain the resource such as metal ores, oil, and most forms of energy. There are very few resources that are considered inexhaustible (will not run out in foreseeable future) – these are solar radiation, geothermal energy, and air (though access to clean air may not be). The vast majority of resources are exhaustible, which means they have a finite quantity, and can be depleted if managed improperly.

In this research I will talk about non-renewable resources and renewable resources, water and how can we use it in life and what makes the water very important.

# Chapter (1):

## Section (1): Non-renewable resources:

Which is about the resources that will end with the passage of time for frequent use which is found in nature in limited quantities. In addition it is so polluting and constitute 86 % of the world in general need of energy.

Fossil fuel is the fuel is used for the production of fossil energy. And fossil fuels extracted from fossil stone materials such as coal, natural gas and oil.

This material is extracted and turn out of the ground and burn up in the air with oxygen to produce heat which used in all fields.

Fossil fuel installation depends on the carbon cycle in nature, by this way the energy had been stored from the old ages to use it today.

According to global estimates the fossil sources will cover about 90% of the global need for energy in 2030. In 2005 the ratio was 81%.

Fossil fuels consists of three main types are:

1 - Coal.
2. Crude oil.
3. Natural gas.

This type of fuel was formed in Geological Ages, especially in the Carboniferous period (Carboniferous era) since more than 200 million years old. It is believed that it formed from the remains of living organisms, plant and animal, including the large and microscopic, which was buried under the earth's crust. And with pressure and heat over millions of years it transformed l, oil and natural gas.

In general, fossil fuels made up:

1. Living microscopic creatures and plants died and plunged into the seabed and the ocean or swamp.
2. Sedimentary materials covered residues of these substances in the sedimentary rocks.
3. The material was decomposed as a result of high temperatures and high pressure and turned to fossil fuels.

The most important uses of fossil fuels all over the world are:

- Electricity generation, which uses heat produced by burning coal or some oil derivatives in natural or gas heating water to produce steam which is used in turbines connected to generators of electricity management.
- Running different transportation, where it is petroleum products, Kgazulan, diesel and kerosene, the most widely used fuel.

All these types of fuel consisting primarily of carbon and hydrogen in different proportions.

There may also be some of the other elements, but much less such as oxygen, sulfur and nitrogen.

Features: fossil fuel:

1. Easily releases large amounts of energy when burned.
2. Coal used to make steel.
3. Oil is used to make petrochemicals: This material makes them a lot of goods: medicines, cosmetics, paints and plastics.

Coal:

Coal is a balk or brown rock and it is flammable and combustion. When the combustion of coal it produces energy in the form of heat. You can use the heat from the combustion of coal in home heating, and fuel for locomotives at the beginning of the era of steam machine, the main use of this energy today is in the production of electricity. Also coal used in the production of coke, which is a key raw material in the steel and iron industry. And which used in medicines, dyes and fertilizer industry.

Since the begging of 20 century, the oil and natural gas have become the best two energy resources in most countries around the world. In contrast to coal; the oil can be converted into gasoline and diesel and other materials necessary for the operation of modern transportation. Natural gas take coal place to generate thermal energy, but the current consumption of the world's resources of oil and natural gas are being rapidly. If high consumption continues at the current level, the oil resources are depleted and will consume during the first half of the twentieth century. The natural gas resources will dry in the mid –first 21 century. The sources of the world's coal will remain sufficient for about 220 years to come, according to the current rates of consumption.

The growing use of coal in electricity has been plugging growing shortage of both gas and oil production. However, the use of coal carries with it the problems of a different kind as the combustion major cause of air pollution and increased carbon dioxide mimics. Several means have been developed to reduce pollution but it was expensive and did not prove useful so far. And it must improve the ways and methods before the major expansion in the use of coal. In addition to this, some of the coal found in deep layers below the surface, where it is difficult to extract.

Coal generated from the remains of plants that are cut off by the air - for example, in swamps - and cannot decomposition and later came under great pressure and external temperature. The water and impurities, has blown with the time passing to be with peat and coal varying degrees in terms of the mixture and the purity and intensity.

- Coal consists of a mixture of compounds at different rates. The key element in these compounds is carbon, also contains varying proportions of hydrogen, nitrogen, sulfur and oxygen.

- The oil and natural gas are mix of many compounds called hydrocarbons, often composed of elemental hydrogen and carbon .And the oil is heavy acetic dark color often cannot be used properly only after it separates into several components in process called distillation molecular and this is done in the retail towers.

One of the main oil derivatives are gasoline, kerosene, diesel, lubricants and other petroleum

Terms of creation oil are:

1. That the water is not deep because the dissolved oxygen in the water reacts with the organic material component of the bodies of marine plankton and turning it into a ($H_2O$, $CO_2$).
2. The percentage of organic matter to be relatively high in the sedimentary rock which mixed him and less so to be in the range of 1% of the sedimentary rock.
3. To be a source of rock deep underground at least in depth (3000 m).

Oil creation stages are:

After the death of marine plankton - settle to the bottom - buried with sediment - source rocks shape - and constantly deposition

- Accumulate sedimentary layers - generated pressure and temperature - mature organic matter - oil composed - often migrates oil - congregate in other rocks called (oil traps) - digging wells to extract it from the place - it is sent to refineries.

- Natural gas is mostly made up of methane $CH_4$ and other gases as Ethan and Propane.

The following equations show the combustion of both coal and methane gas:

$2C\ (s) + 2O_2\ (g) \Longrightarrow 2CO_2\ (g) + Energy$

$CH_4\ (g) + 2O_2\ (g) \Longrightarrow CO_2\ (g) + 2H_2O\ (1) + Energy$

For the various fossil fuel several different kinds of features including:

- Currently available in large quantities.
- It burns easily producing a large amount of thermal energy

That can be used to generate electricity and other important purposes
As cooking and heating.

- Easy to transport

In spite of the large number of advantages, however, the use cause negatives:
- Stems from the combustion of many gases such as sulfur dioxide, nitrogen oxides and carbon dioxide, which lead to (Global Warming) and create acid rain and causing a lot of lung disease.
- Prices and availability is linked to the political conditions of its production areas. [1]

## Section (2): Renewable resources:

A renewable resource is an organic natural resource which can replenish to overcome usage and consumption, either through biological reproduction or other naturally recurring processes. Renewable resources are a part of Earth's natural environment and the largest components of its ecosphere. A positive life cycle assessment is a key indicator of a resource's sustainability. [2]

### First (Solar energy):

Solar energy is radiant light and heat from the Sun harnessed using a range of ever-evolving technologies such as solar heating, photovoltaics, solar thermal energy, solar architecture and artificial photosynthesis. [3][4]

The Earth receives 174,000 terawatts (TW) of incoming solar radiation (insolation) at the upper atmosphere. [5]
Approximately 30% is reflected back to space while the rest is absorbed by clouds, oceans and land masses. The spectrum of solar light at the Earth's surface is mostly spread across the visible and near-infrared ranges with a small part in the near-ultraviolet. [6]

### Applications of solar energy:

1- Agriculture and horticulture.
2- Water heating.
3- Heating, cooling and ventilation.
4- Cooking.
5- Water treatment.
6- Electricity generating.[1]

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1 http://www.startimes.com/?t=27512493.
2 "Management for a Small Planet" by Jean Garner Stead and W. Edward Stead, M.E. Sharpe 2009.
3 "Solar Energy Perspectives: Executive Summary". International Energy Agency. 2011. Archived from the original (PDF) on 2011-12-03.
4 "Energy". rsc.org.
5 Smil (1991), p. 240.
6 "Natural Forcing of the Climate System". Intergovernmental Panel on Climate Change. Retrieved 2007-09-29.

(1)

Solar water disinfection in Indonesia

## Second (wind energy):

Wind power is extracted from air flow using wind turbines or sails to produce mechanical or electrical power. Windmills are used for their mechanical power, wind pumps for water pumping, and sails to propel ships. Wind power as an alternative to fossil fuels, is plentiful, renewable, widely distributed, clean, produces no greenhouse gas emissions during operation, and uses little land. [7] The net effects on the environment are far less problematic than those of nonrenewable power sources.

Wind farms consist of many individual wind turbines which are connected to the electric power transmission network. Onshore wind is an inexpensive source of electricity, competitive with or in many places cheaper than coal or gas plants. [8][9][10] Offshore wind is steadier and stronger than on land, and offshore farms have less visual impact, but construction and maintenance costs are considerably higher. Small onshore wind farms can feed some energy into the grid or provide electricity to isolated off-grid locations. [11]

Wind turbines are devices that convert the wind's kinetic energy into electrical power. The result of over a millennium of windmill development and modern engineering, today's wind turbines are manufactured in a wide range of horizontal axis and vertical axis types. [2]

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7 Fthenakis, V.; Kim, H. C. (2009). "Land use and electricity generation: A life-cycle analysis". Renewable and Sustainable Energy Reviews 13 (6–7): 1465. doi:10.1016/j.rser.2008.09.017.

8 "Wind power is cheapest energy, EU analysis finds". The guardian. Retrieved 15 October 2014

9 David Richard Walwyn, Alan Coli Brent, Renewable energy gathers steam in South Africa. In: Renewable and Sustainable Energy Reviews 41, (2015), 390–401, doi:10.1016/j.rser.2014.08.049.

10 Robert Gasch, Jochen Twele (ed.): Windkraftanlagen. Grundlagen, Entwurf, Planung und Betrieb. Springer, Wiesbaden 2013, p 569 (German).

11 Gipe, Paul (1993). "The Wind Industry's Experience with Aesthetic Criticism". Leonardo 26 (3): 243–248. Doi: 10.2307/1575818. JSTOR 1575818.

Slightly larger turbines can be used for making small contributions to a domestic power supply while selling unused power back to the utility supplier via the electrical grid. Arrays of large turbines, known as wind farms, have become an increasingly important source of renewable energy and are used in many countries as part of a strategy to reduce their reliance on fossil fuels.

The smallest turbines are used for applications such as battery charging for auxiliary power. Wind turbine design is the process of defining the form and specifications of a wind turbine to extract energy from the wind. [12] A wind turbine installation consists of the necessary systems needed to capture the wind's energy, point the turbine into the wind, convert mechanical rotation into electrical power, and other systems to start, stop, and control the turbine.

In 1919 the German physicist Albert Betz showed that for a hypothetical ideal wind-energy extraction machine, the fundamental laws of conservation of mass and energy allowed no more than 16/27 (59.3%) of the kinetic energy of the wind to be captured. This Betz limit can be approached in modern turbine designs, which may reach 70 to 80% of the theoretical Betz limit. [13][14]

## Third (Geothermal energy):

Geothermal energy is thermal energy generated and stored in the Earth. Thermal energy is the energy that determines the temperature of matter. The geothermal energy of the Earth's crust originates from the original formation of the planet and from radioactive decay of materials (in currently uncertain [15] but possibly roughly equal [16] proportions). The geothermal gradient, which is the difference in temperature between the core of the planet and its surface, drives a continuous conduction of thermal energy in the form of heat from the core to the surface.

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12 "Efficiency and performance" (PDF). UK Department for Business, Enterprise & Regulatory Reform. Retrieved 29 December 2007.
13 Betz, A.; Randall, D. G. (Trans.). Introduction to the Theory of Flow Machines, Oxford: Pergamon Press, 1966.
14 Burton, Tony, et al., (ed). Wind Energy Handbook, John Wiley and Sons, 2001, ISBN 0471489972, p. 65.
15 Dye, S. T. (2012). Geoneutrinos and the radioactive power of the Earth. Reviews of Geophysics, 50(3).
16 Gando, A., Dwyer, D. A., McKeown, R. D., & Zhang, C. (2011). Partial radiogenic heat model for Earth revealed by geoneutrino measurements. Nature Geoscience, 4(9), 647–651.

The adjective geothermal originates from the Greek roots γη (ge), meaning earth, and θερμος (thermos), meaning hot.

Earth's internal heat is thermal energy generated from radioactive decay and continual heat loss from Earth's formation. [17] Temperatures at the core–mantle boundary may reach over 4000 °C (7,200 °F). [18] The high temperature and pressure in Earth's interior cause some rock to melt and solid mantle to behave plastically, resulting in portions of mantle convicting upward since it is lighter than the surrounding rock. Rock and water is heated in the crust, sometimes up to 370 °C (700 °F). [19]

From hot springs, geothermal energy has been used for bathing since Paleolithic times and for space heating since ancient Roman times, but it is now better known for electricity generation. Worldwide, 11,700 megawatts (MW) of geothermal power is online in 2013. [20] An additional 28 gigawatts of direct geothermal heating capacity is installed for district heating, space heating, spas, industrial processes, desalination and agricultural applications in 2010. [21]

Geothermal power is cost effective, reliable, sustainable, and environmentally friendly, [22] but has historically been limited to areas near tectonic plate boundaries. Recent technological advances have dramatically expanded the range and size of viable resources, especially for applications such as home heating, opening a potential for widespread exploitation. Geothermal wells release greenhouse gases trapped deep within the earth, but these emissions are much lower per energy unit than those of fossil fuels. As a result, geothermal power has the potential to help mitigate global warming if widely deployed in place of fossil fuels.

The Earth's geothermal resources are theoretically more than adequate to supply humanity's energy needs, but only a very small fraction may be profitably exploited. Drilling and exploration for deep resources is very expensive.[3]

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17 Turcotte, D. L.; Schubert, G. (2002), Geodynamics (2 ed.), Cambridge, England, UK: Cambridge University Press, 136–137, ISBN 978-0-521-66624-4.

18 Lay, Thorne; Hernlund, John; Buffett, Bruce A. (2008), "Core–mantle boundary heat flow", Nature Geoscience 1: 25, Bibcode: 2008NatGe...1...25L, doi:10.1038/ngeo.2007.44.

19 Nemzer, J, Geothermal heating and cooling.

20 Geothermal capacity | About BP | BP Global, Bp.com, retrieved 2014-11-15.

21 Fridleifsson, Ingvar B.; Bertani, Ruggero; Huenges, Ernst; Lund, John W.; Ragnarsson, Arni; Rybach, Ladislaus (2008-02-11), O. Hohmeyer and T. Trittin, ed., The possible role and contribution of geothermal energy to the mitigation of climate change (PDF), Luebeck, Germany, 59–80, retrieved 2009-04-06.

22 Glassley, William E. (2010). Geothermal Energy: Renewable Energy and the Environment, CRC Press, ISBN 9781420075700. [Page needed].

Forecasts for the future of geothermal power depend on assumptions about technology, energy prices, subsidies, and interest rates. Pilot programs like EWEB's customer opt in Green Power Program [23] show that customers would be willing to pay a little more for a renewable energy source like geothermal. But as a result of government assisted research and industry experience, the cost of generating geothermal power has decreased by 25% over the past two decades. [24] In 2001, geothermal energy cost between two and ten US cents per kWh. [25]

 (2)

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## Chapter (2):
## Water energy:

Water (chemical formula: $H_2O$) is a transparent fluid which forms the world's streams, lakes, oceans and rain, and is the major constituent of the fluids of organisms. As a chemical compound, a water molecule contains one oxygen and two hydrogen atoms that are connected by covalent bonds.

23 Green Power. eweb.org.

24 Cothran, Helen (2002), Energy Alternatives, Greenhaven Press, ISBN 0737709049[page needed].

25 Fridleifsson, Ingvar B (2001), "Geothermal energy for the benefit of the people", Renewable and Sustainable Energy Reviews 5 (3): 299, doi: 10.1016/S1364-0321(01)00002-8.

Water is a liquid at standard ambient temperature and pressure, but it often co-exists on Earth with its solid state, ice; and gaseous state, steam (water vapor). It also exists as snow, fog, dew and cloud.

Water covers 71% of the Earth's surface. [26] It is vital for all known forms of life. On Earth, 96.5% of the planet's crust water is found in seas and oceans, 1.7% in groundwater, 1.7% in glaciers and the ice caps of Antarctica and Greenland, a small fraction in other large water bodies, and 0.001% in the air as vapor, clouds (formed of ice and liquid water suspended in air), and precipitation. [27][28] Only 2.5% of this water is freshwater, and 98.8% of that water is in ice (excepting ice in clouds) and groundwater. Less than 0.3% of all freshwater is in rivers, lakes, and the atmosphere, and an even smaller amount of the Earth's freshwater (0.003%) is contained within biological bodies and manufactured products. [29] A greater quantity of water is found in the earth's interior. [30]

## Applications of water energy:

### Section (1): Water wheel:

A water wheel is a machine for converting the energy of free-flowing or falling water into useful forms of power, often in a watermill. A water wheel consists of a large wooden or metal wheel, with a number of blades or buckets arranged on the outside rim forming the driving surface. Most commonly, the wheel is mounted vertically on a horizontal axle, but the tub or Norse wheel is mounted horizontally on a vertical shaft. Vertical wheels can transmit power either through the axle or via a ring gear and typically drive belts or gears; horizontal wheels usually directly drive their load.

The water mill was used for grinding grain, producing flour for bread, malt for beer, or coarse meal for porridge. [31] Hammer mills used the wheel to operate hammers. One type was fulling mill, which was used for cloth making.[5]

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26 "CIA – The world factbook". Central Intelligence Agency. Retrieved 20 December 2008.

27 Gleick, P.H., ed. (1993). Water in Crisis: A Guide to the World's Freshwater Resources. Oxford University Press. p. 13, Table 2.1 "Water reserves on the earth".

28 Water Vapor in the Climate System, Special Report, [AGU], and December 1995 (linked 4/2007). Vital Water UNEP. Archived 24 March 2015 at the Wayback Machine.

29 Crocket, Christopher (5 September 2015). "Quest to trace origin of Earth's water is 'a complete mess'". Science News. Retrieved 1 October 2015.

30 Robert, Friedel, a Culture of Improvement. MIT Press. Cambridge, Massachusetts. London, England. (2007).

31 Robert, Friedel, A *Culture of Improvement*. MIT Press. Cambridge, Massachusetts. London, England. (2007).

The trip hammer was also used for making wrought iron and for working iron into useful shapes, an activity that was otherwise labor-intensive. The water wheel was also used in papermaking, beating material to a pulp. In the 13th century water mills used for hammering throughout Europe improved the productivity of early steel manufacturing. Along with the mastery of gunpowder, waterpower provided European countries worldwide military leadership from the 15th century.


(3)

## Section (2): Hydroelectric:

Hydroelectricity is the term referring to electricity generated by hydropower; the production of electrical power through the use of the gravitational force of falling or flowing water. It is the most widely used form of renewable energy, accounting for 16 percent of global electricity generation – 3,427 terawatt-hours of electricity production in 2010, [32] and is expected to increase about 31% each year for the next 25 years.

The cost of hydroelectricity is relatively low, making it a competitive source of renewable electricity. The average cost of electricity from a hydro station

larger than 10 megawatts is 3 to 5 U.S. cents per kilowatt-hour. [32] It is also a flexible source of electricity since the amount produced by the station can be changed up or down very quickly to adapt to changing energy demands. However, damming interrupts the flow of rivers and can harm local ecosystems, and building large dams and reservoirs often involves displacing people and wildlife. [32] Once a hydroelectric complex is constructed, the project produces no direct waste, and has a considerably lower output level of the greenhouse gas carbon dioxide (CO2) than fossil fuel powered energy plants. [33]

The ranking of hydro-electric capacity is either by actual annual energy production or by installed capacity power rating. Hydro accounted for 16 percent of global electricity consumption, and 3,427 terawatt-hours of electricity production in 2010, which continues the rapid rate of increase experienced between 2003 and 2009. [32]

Hydropower is produced in 150 countries, with the Asia-Pacific region generated 32 percent of global hydropower in 2010. China is the largest hydroelectricity producer, with 721 terawatt-hours of production in 2010, representing around 17 percent of domestic electricity use. Brazil, Canada, New Zealand, Norway, Paraguay, Austria, Switzerland, and Venezuela have a majority of the internal electric energy production from hydroelectric power. Paraguay produces 100% of its electricity from hydroelectric dams, and exports 90% of its production to Brazil and to Argentina. Norway produces 98–99% of its electricity from hydroelectric sources. [34]

Advantages:

1-Flexibility.
2-Low power costs.
3-Suitability for industrial applications.
4-Reduced CO2 emissions.

Disadvantages:

1-Ecosystem damage and loss of land.
2-Siltation and flow shortage.
3-Methane emissions (from reservoirs).[6]

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32 Worldwatch Institute (January 2012). "Use and Capacity of Global Hydropower Increases".

33 Renewables 2011 Global Status Report, page 25, Hydropower, REN21, published 2011, accessed 2011-11-7.

34 Binge and purge". The Economist. 2009-01-22. Retrieved 2009-01-30. "98-99% of Norway's electricity comes from hydroelectric plants."

The Three Gorges Dam in Central China is the world's largest power producing facilitiy of any kind.

(4)

## Section (3): Tidal Power:

Tidal power, also called tidal energy, is a form of hydropower that converts the energy of tides into useful forms of power, mainly electricity.

Although not yet widely used, tidal power has potential for future electricity generation. Tides are more predictable than wind energy and solar power. Among sources of renewable energy, tidal power has traditionally suffered from relatively high cost and limited availability of sites with sufficiently high tidal ranges or flow velocities, thus constricting its total availability. However, many recent technological developments and improvements, both in design (e.g. dynamic tidal power, tidal lagoons) and turbine technology (e.g. new axial turbines, cross flow turbines), indicate that the total availability of tidal power may be much higher than previously assumed, and that economic and environmental costs may be brought down to competitive levels.

Tidal power is taken from the Earth's oceanic tides; tidal forces are periodic variations in gravitational attraction exerted by celestial bodies. These forces create corresponding motions or currents in the world's oceans. Due to the strong attraction to the oceans, a bulge in the water level is created, causing a temporary increase in sea level. When the sea level is raised, water from the middle of the ocean is forced to move toward the shorelines, creating a tide. This occurrence takes place in an unfailing manner, due to the consistent pattern of the moon's orbit around the earth. [35] The magnitude

35 DiCerto, JJ (1976). The Electric Wishing Well: The Solution to the Energy Crisis. New York: Macmillan.

and character of this motion reflects the changing positions of the Moon and Sun relative to the Earth, the effects of Earth's rotation, and local geography of the sea floor and coastlines.

Tidal power is the only technology that draws on energy inherent in the orbital characteristics of the Earth– Moon system, and to a lesser extent in the Earth–Sun system. Other natural energies exploited by human technology originate directly or indirectly with the Sun, including fossil fuel, conventional hydroelectric, wind, biofuel, wave and solar energy. Nuclear energy makes use of Earth's mineral deposits of fissionable elements, while geothermal power taps the Earth's internal heat, which comes from a combination of residual heat from planetary accretion (about 20%) and heat produced through radioactive decay (80%). [36]

A tidal generator converts the energy of tidal flows into electricity. Greater tidal variation and higher tidal current velocities can dramatically increase the potential of a site for tidal electricity generation.[7]

The world's first commercial-scale and grid-connected tidal stream generator – SeaGen – in Strangford Lough.[9] The strong wake shows the power in the tidal current.

(5)

36 Turcotte, D. L.; Schubert, G. (2002). "Chapter 4". Geodynamics (2nd Ed.). Cambridge, England, UK: Cambridge University Press. pp. 136–137. ISBN 978-0-521-66624-4.

## Chapter (3):
## Water in lives:

In physiology, the water is contained in the tissues, the blood, the bones and everywhere. This water makes up a significant fraction of the human body, both by weight and by volume.

The usual way of adding water to a body is by drinking. In addition, water enters the body with foods, especially those rich in water, such as plants, raw meat, and fish. The amount of this water that is retained in animals is affected by several factors. For instance, animal body water amounts vary with the age of the animal. The older the vertebrate animal, the higher its relative bone mass and the lower its body water content. Water in the animal body performs a number of functions: as a solvent for transportation of nutrients; as a medium for excretion; a means for heat control; as a lubricant for joints; and for shock absorption. [37]

Most of animal body water is contained in various body fluids. These include Intracellular fluid; Extracellular fluid; Plasma; Interstitial fluid and Trans cellular fluid. [38] Water is also contained inside organs, in gastrointestinal, cerebrospinal, peritoneal, and ocular fluids. Adipose tissue contains about 10% of water, while muscle tissue contains about 75%. [37][39]

By weight, the average human adult male is approximately 55%-75% water. [40][41][42] However, there can be considerable variation in body water percentage based on a number of factors like age, health, weight, and sex. In a large study of adults of all ages and both sexes, the adult human body averaged ~65% water. However, this varied substantially by age, sex, and adiposity (amount of fat in body composition). The figure for water fraction by weight in this sample was found to be 48 ±6% for females and 58 ±8% water for males. [43] 8

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37 "FCS Animal Production L2". google.com.

38 John T. Hansen, Bruce M. Koeppen, (2002). Netter's Atlas of Human Physiology. Teterboro, N.J: Icon Learning Systems. ISBN 1-929007-01-9.

39 "Nutrient Requirements of Nonhuman Primates:" google.com.

40 Jackson, Sheila (1985). Anatomy & Physiology for Nurses. Nurses' Aids Series (9th ed.). London: Bailliere Tindall. ISBN 0-7020-0737-4.

41 Guyton, Arthur C. (1976). Textbook of Medical Physiology (5th ed.). Philadelphia: W.B. Saunders. p. 424. ISBN 0-7216-4393-0.

42 Guyton, Arthur C. (1991). Textbook of Medical Physiology (8th ed.). Philadelphia: W.B. Saunders. p. 274. ISBN 0-7216-3994-1.

43 See table 1. here.

The body water constitutes as much as 73% of the body weight of a newborn infant, whereas some obese people are as little as 45% water by weight.[41][42] These figures are statistical averages, and so like all biostatistics, the estimation of body water will vary with factors such as type of population, age of people sampled, number of people sampled, and methodology. So there is not, and cannot be, a figure that is exactly the same for all people, for this or any other physiological measure.

## Water benefits for humans:

1- Saves water for the body and harmony.
2- Water helps to activate the functions of the kidneys in the body.
3- Water helps to regulate Body temperature.
4- Water works to rid the blood of toxins.
5- It also act as a mediator in many of the chemical processes within the body.
6- It also helps the balance of the body chemical, and gives the body needed moisture.
7- It also works to stimulate the digestive system and members of the directing.
8- It also works on the lubricating and moisturizing body joints.
9- It also move the food in the body tissues.

# Conclusion:

Water is very important in our lives as we saw in the research and it can be used in very different ways. We used it for a long time and we will develop those ways and invent other ways because human brains can do anything. In addition, water is necessary for humans, animals and plants to keep them alive and to help them to do biological processes.

Energy from river water supplies about one-fifth of the world's electricity—with 850 to 900 gigawatts of installed capacity worldwide. More than 60 countries get over half their electricity from hydropower. But figuring out how much hydropower will be available in the future, and how those highly dependent nations will fare, is becoming more difficult.

Today, behemoths like the Hoover Dam and the Grand Coulee Dam are the best known examples of hydropower production, but their time is running out. A long history of dam collapses and large-scale environmental destruction have dethroned major dams as the go -to source of water-generated electricity, and a wide range of new methods and technologies are being developed to make hydropower the energy of the future.

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6- "Natural Forcing of the Climate System". Intergovernmental Panel on Climate Change. Retrieved 2007-09-29.
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43- See table 1. here.