Water-energy Nexus

[1]Abeena Prolta
[1]Student
[1]Banasthali Vidyapith

***Abstract* - Water- energy nexus means the relationship between water and energy. This concept refers to the amount of water used for production of electricity and sources of fuel like oil and fossil fuel. Therefore, the energy consumed for extraction, purifying, delivering, heat/cool, treat and lose water typically mentioned because the energy intensity. The link isn't actually a control system because the water used for energy production system needs to be be an equivalent water that is used to remove exploited energy. However all types of energy production need some input of water creating the link unresolvable.**

***keywords* - Water, energy, water-energy nexus, risk, sustainable development, planning, electricity, vulnerable.**

I. INTRODUCTION

There are various challenges faced by the world in context with water and energy which are increasing day by day. It is indicated by global projections that demand for freshwater and energy will increase significantly over the decades under the pressure of mobility, population growth, international trade, urbanization, climatic change etc. Population of world will reach about 8.66 billion by 2025, the demand for water and energy is going to increase manifold. Water-energy nexus is central to sustainable development. Largest consumer of the world's freshwater resources is agriculture. The released linkages between these critical domains needs a suitably integrated approach for water energy security. Water resources are decreasing day by day and the dependency of energy sector on water leads to sustainable development.

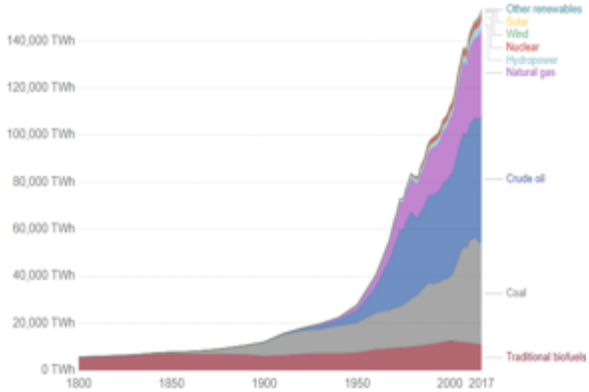
II. RISK TO THE ENERGY SECTOR

Water scarcity is threatening the long-term viability of energy projects globally. Last year, water shortages shut down the thermal power plants in India, which ultimately decreased energy production in power plants in the United States and threatened hydropower capacity in various countries, including Sri Lanka, China and Brazil.

Around 93 percent of the Middle East's onshore oil reserves are exposed from medium to extremely high overall water quantity risks. Developing countries are most vulnerable, as they often lack capacity to meet the rapidly growing needs.

Despite these concerns, energy planning and production is made without taking into consideration about existing and future water constraints.

III. GLOBAL PRIMARY ENERGY CONSUMPTION



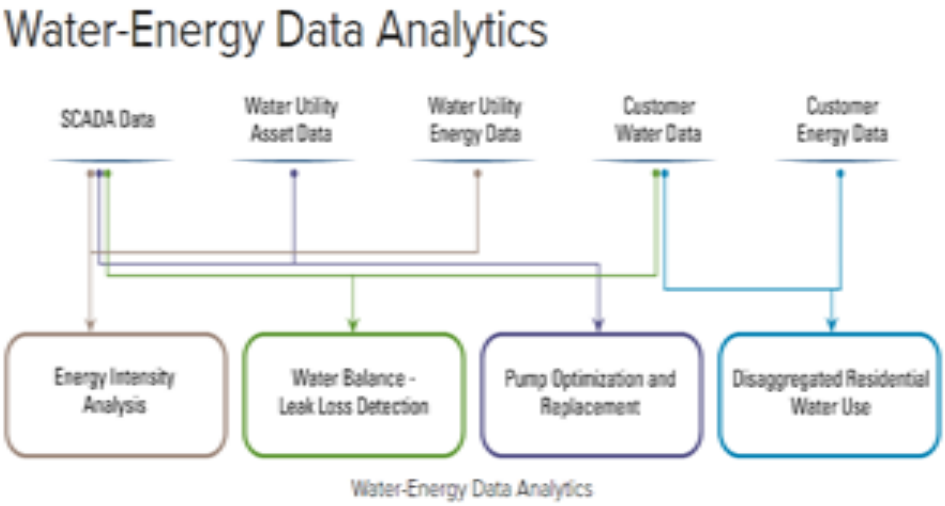
Here is total levels of consumption distributed across the world's regions. In the chart we see primary energy consumption from 1965-2015 which is aggregated by continental regions. Note that this dataset only includes commercially-traded fuels i.e. coal, oil, gas, nuclear, and modern renewables. This means traditional biofuels are not included here. As a result, figures are likely to be a small underestimate for some regions (predominantly Africa and developing Asia) where populations still strongly rely on traditional biomass as a primary fuel source.

IV. WATER ENERGY NEXUS

Samples of overwhelming water for manufacturing energy embrace hydropower generation and biofuel mistreatment of water. Energy consumption examples enclosed pumping water for food and treating waste matter mistreatment electricity agricultural irrigation within the spanish water sector showed giant growth in its energy. An assessmemnt of bioenergy like microalgaae and use of abandoned mines for water storage, and use of star pumps and quench systems for water pumping and charge were known as environmental activities. Multiple market management approaches as well as tariffs and investments, investigation on waste water treatment plant as well as sedimentary rock gas development from a life cycle

perspective, promoting well-regulated on-site treatmen technologies, evaluating situations of carbon and water costs were additionally known. From a social and governance perspective, comes were developed to boost correct, fine-scale, site-specific knowledge for quantitative assessment of the water–energy nexus and neutral engagement. Information dissemination through websites is another technique for the sweetening of the water–energy nexus.

V. WATER ENERGY DATA ANALYTICS



CWEE has developed a scientific approach to assess the energy intensity of delivered water inside a water agency spot. Through evaluating the energy intensity of a water system throughout area and time, utility agencies receive insight on the way to direct water system management enhancements.

VI. IMPROVE WATER-ENERGY NEXUS

In the last years, there has been an excellent interest within the advanced relations between energy and water, called the Water-Energy Nexus. Natural resources, like energy and water, modify economy growth and support quality of life. The Water-Energy Nexus is taken into account joined of foremost vital challenges that the worldwide growing water market have to face within the forthcoming years. Currently, several water systems don't seem to be managed sustainably enough. Utilities of water face different challenges, like infrastructure aging and poor cost-recovery, resulting in an absence of finance for O&M (Operation and Maintenance). Energy is needed for water production and distribution, from pumping and treatment to transportation. Energy prices square measure a concern for water utilities, despite geographics, size and level of water network potency. On the other hand, water utilities square measures have a tough time to either improve their services or expand their network to unserved neighborhoods in developing countries.

The current trend of water gear to the creation of DMAs (District Metered Areas) offers nice potentialities of non-structural solutions that use existing knowledge and remodel them into helpful information to support deciding. The sensible metering and also the use of enormous amounts of information from a network enhance the employment of software system for call support, however it is not the sole means. It's developed combining key factors of the energy consumption and also the water into water management to get enhancements from each water and energy fields. This non structural answer will increase resource potency and environmental performance of water distribution networks by exploitation knowledge acquisition and geographical visual image (real time & historical), weather and water demand foretelling, detection of networks events and hydraulic simulation of the network, and at last through a choice web supported machine learning.

CONCLUSION

As a conclusion, a non-structural answer for the Nexus problems will have an excellent excellent impact on many matters (climate amendment, carbon footprint, WUs balance sheets, and water losses) with cheap investment either in sensible metering or networks with solely a couple of sensors measure.

REFERENCES

[1] https://www.watereducation.org/topic-energy-and-water
[2] https://www.ripublication.com/ijaes17/ijaesv12n2_04.pdf
[3] https://www.unwater.org/water-facts/water-food-and-energy/
[4] https://www.nap.edu/read/25121/chapter/3#13
[5] https://www.energy.gov/downloads/water-energy-nexus-challenges-and-opportunities
[6] https://www.google.com/search?q=energy+use+graph&sxsrf=ACYBGNQTv77Lr7N7G2ylXJRaDjYIRZ9_3g:1577631620317&tbm=isch&source=iu&ictx=1&fir=FnfKg3gQpLoBXM%253A%252CyL4WTcYwXgBHwM%252C_&vet=1&usg=AI4_-kRgCRpYUc2T0tdgGq0Psjxq2W1PMg&sa=X&ved=2ahUKEwi-0cLij9vmAhVYbSsKHa3RC6oQ9QEwAXoECAoQLA#imgrc=j4WWkvv1z6UsRM:&vet=1