FROM THE VOICE OF SADHGURU THROUGH AQUAPONICS

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ABSTRACT :

According to recent study there is only few amount of cultivating soil present in the world. Many of the world's soils are now in crisis - degraded and eroding, often as a result of intensive farming practices. The good news is that by changing the way we farm and eat, we can help protect our soils, for generations to come. And a campaign SAVE SOIL that is organised by Sadhguru -Yogi, mystic and visionary, named one of India's 50 most influential people, Sadhguru's work has touched the lives of millions worldwide through his transformational programs.

Save Soil – a Global Movement to invoke a conscious approach to soil. One of the main objectives of the movement is to show governments across the world that their citizens want policies that revive ecology and soil.

Food scarcity is one of the world's most pressing issues and is threatened further by rising human populations, inefficient conventional agricultural practices, declining freshwater, and the outcomes of climate change.

INTRODUCTION :

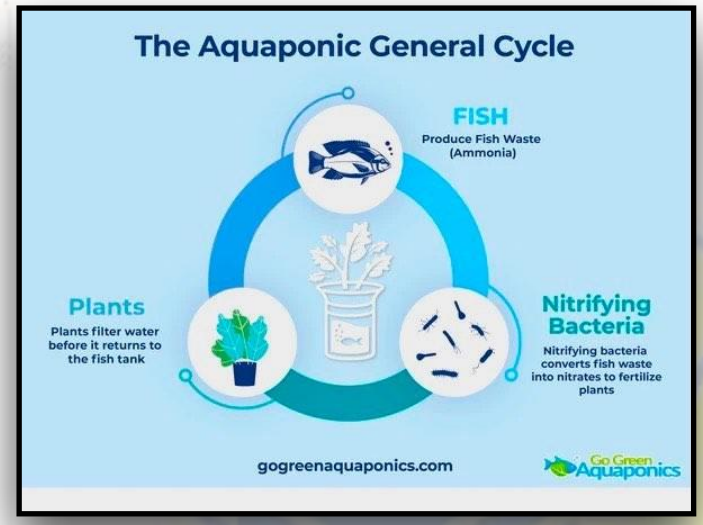
Aquaculture being the fastest-growing food-producing sector in the world employs different kinds of production systems. Among these systems, aquaponics is considered one of the most efficient. Aquaponics is originated from two different sources Aquaculture (growing aquatic life in closed environment) and Hydroponics (growing plants without soil).

Aquaponics provides a solution to the main issues these two systems face; the need for sustainable ways of filtering or disposing of nutrient-rich fish waste in aquaculture and the need for nutrient-rich water to act as a fertiliser with all of the nutrients and minerals needed for plants grown through hydroponics.

In Aquaponics , the plants are grown in the grow bed, and fish are placed in the fish tank. The nutrient-rich water from the fish tank that contains fish waste is fed to the grow bed, where billions of naturally occurring beneficial bacteria break the ammonia down into nitrites and then into nitrates.

WORKING :

Aquaponics relies on two aspects one is aquaculture and the other is hydroponics. Firstly the system depends upon the food which is fed to the aquatic animals , which works as the system's input. As the aquatic creature eat this food and process it, they transform it into urine and fecal matter, both rich in ammonia, which in sufficient quantities can be toxic to plants and aquatic matters. After this, the water (ammonia rich) which is home for the above aquatic life gets sent into biofilter . In biofilter, the bacteria breaks down everything into the organic nutrient compounds which is rich in nitrogen and used in the production of crops.
This concept mainly depends upon the 3 main components, aquatic animals , plants, bacteria (that converts into organic nutrient).



ADVANTAGES OF AQUAPONICS:

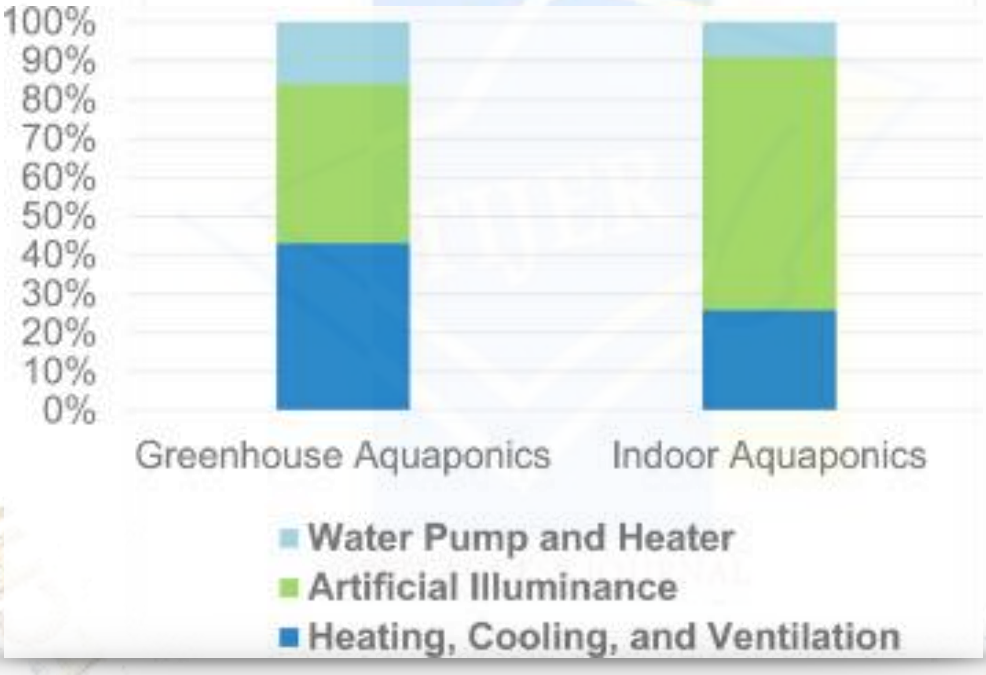
- Aquaponics doesn't require soil hence it won't spoil the soil. - Save Soil
- The fish excreta acts as a natural fertilizer for plants, which in turn purifies the water for fishes, and the cycle continues. - Environmental Friendly
- Effective use of nutrients sources.
- Food can be grown all throughout the year, without any wait for the season.
- It even reduces the carbon foot print , it requires 6x less space than the old traditional method. Talking about the positives, there may be a lot to talk.

Conception :

Addressing the fact that the aquaponics follows the water reusing technology and the nutrient principles , With current food production goals no longer aimed at simply maximizing productivity but optimizing outputs across different production systems, aquaponics technology holds an
immense potential in ensuring food security.
There is no simple solution to ensuring food security, but technological innovations in food production systems can directly support food insecure people to achieve some level of food self-sufficiency, particularly nutrition security.

However, indoor growing spaces rely exclusively on artificial illuminance and require less insulation when compared to greenhouses, and as such consume higher portion of electricity for lighting. Artificial illuminance alone accounts for an estimated 65% of the total energy consumed by indoor aquaponics.

Furthermore, artificial lighting, which provides the energy required to carry out photosynthesis - a photochemical reaction occurring within plant cells converting atmospheric CO2 to carbohydrate, contributes to 20-30% of the total production cost associated with indoor farming



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Conclusion :

As per the results of the data collected from the research papers, we can conclude this in two ways, like few crops give good yield and few give good quality and even more one can give good taste and other can give you good nutrients , hence aquaponics highly depends on the perspectives the users uses.

I truly believe that the aquaponics is the best alternative method for the crop cultivation in the upcoming days as its the eco-friendly method for the 21st century food production system that integrates the soilless production of plants. Despite there were many years on research, there are many areas which the researchers need to focus on. This may involve the integration of the aquaponics system with other food production systems which may result in increased efficiency/ productivity, reduction in waste disposal, as well as reduced energy and water usage. Only addressing those factors thoroughly will eventually validate aquaponics as a sustainable food production alternative.

References :

[1]. Adler, P. R., Harper, J. K., Wade, E. M., Takeda, F., and Summerfelt, S. T. 2000. Economic analysis of an aquaponic system for the integrated production of rainbow trout and plants. International Journal of Recirculating Aquaculture 1(1):15–34.

[2]. Rakocy, J.E. Island Perspectives; Virgin Islands agricultural Experiment Station: Saint Croix, VI, USA, 1989; pp. 5–10. [Google Scholar]

[3]. K Gosh, S Chowdhury - Journal of Agricultural, Environmental and …, 2019 - researchgate.net

[4]. S Goddek, B Delaide, U Mankasingh, KV Ragnarsdottir… - Sustainability, 2015 - mdpi.com. ……. Challenges of sustainable and commercial aquaponics

[5]. Ako H, Baker A (2009) Small-scale lettuce production with hydroponics or aquaponics. College of Tropical Agriculture and Human Resources Sustainable Agriculture: 1–7

[6]. Appelbaum S, Kotzen B (2016) Further investigations of aquaponics using brackish water resources of the Negev desert. Ecocycles 2(2):26–35

[7]. KA Obirikorang, W Sekey, BA Gyampoh… - … in Sustainable Food …, 2021 - frontiersin.org

[8]. Nelson, R. & Pade, J. S. (2008). Aquaponic food production. Nelson and Pade, Inc., Montello, WI. p. 218.
[9]. W Lennard, S Goddek - Aquaponics food production systems, 2019 - library.oapen.org……,.Aquaponics: the basics

[10]. HW Palm, U Knaus, S Appelbaum, S Goddek… - Aquaculture …, 2018 - Springer…..Towards commercial aquaponics: a review of systems, designs, scales and nomenclature

[11]. C Maucieri, C Nicoletto, R Junge, Z Schmautz… - Italian Journal of …, 2018 - agronomy.it… Hydroponic systems and water management in aquaponics: A review[12]. J Colt, AM Schuur, D Weaver… - Reviews in Fisheries …, 2022 - Taylor & Francis…Engineering design of aquaponics systems

[13]. KA Obirikorang, W Sekey, BA Gyampoh… - … in Sustainable Food …, 2021 - frontiersin.org….....Aquaponics for improved food security in Africa: A review