International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182, Print ISSN: 2349-5979, Impact Factor: RJIF 5.72
www.allsubjectjournal.com
Volume 3; Issue 10; October 2016; Page No. 225-227

Maritime farms: A way to increase in the rate of economic & commercial growth in agricultural production in less land areas-perspective to food production and food security worldwide

Dr. Ashish Rajendra Mehta

Shri Jain Shwetamber Professional Academy, Indore, Affiliated to Devi Ahilya Vishwa Vidhyalaya, Indore, India

Abstract
Growing population and melting of polar icecaps has posed a mortal menace in front of the entire mankind: Lack of food. That declines the economic growth of relevant area and affects the national development. It also reduces per capita income of the country. Less land farming will become necessary for all to survive and MARITIME FARMING will be proved boon. In this paper we will find the assorted causes and effects of the hostile changes in the environment and our planned resolution for them.

Keywords: Floating Garden, Catastrophic, Polar Ice Caps, Glaciers, Global Warming, Food Production, Food Security, Population Growth

1. Introduction

1.1 Thomas Robert Malthus

Sir Malthus was the first economist to propose a systematic "Theory of Population". He was born near Guildford, Surrey in February 1766. His father was prosperous but unconventional and educated his son at home. Malthus went on to Cambridge University, earning a master's degree in 1791. In 1793, he was made a fellow of Jesus College, Cambridge. In 1805, Malthus became professor of history and political economy (the first holder of such an academic office) at the East India Company's college in Hailey Bury, Hertfordshire, where he remained until his death.

In 1819, Malthus was elected a fellow of the Royal Society and two years later he became a member of the Political Economy Club, whose members included David Ricardo and James Mill. In 1824, he was elected as one of the 10 royal associates of the Royal Society of Literature. Malthus was also one of the co-founders of the Statistical Society of London in 1834.

Malthus' most well-known work 'An Essay on the Principle of Population' was published in 1798, although he was the author of many pamphlets and other longer tracts including 'An Inquiry into the Nature and Progress of Rent' (1815) and 'Principles of Political Economy' (1820).

The main tenets of his argument were radically opposed to current thinking at the time. He argued that increases in population would eventually diminish the ability of the world to feed itself and based this conclusion on the thesis that populations expand in such a way as to overtake the development of sufficient land for crops. Associated with Darwin, whose theory of natural selection was influenced by Malthus' analysis of population growth, Malthus was often misinterpreted, but his views became popular again in the 20th century with the advent of Keynesian economics.

1.2 Malthus theory of population

In "Essay on the Principle of Population", Malthus proposes the principle that-

1. Human populations grow exponentially (i.e., doubling with each cycle) while food production grows at an arithmetic rate (i.e. by the repeated addition of a uniform increment in each uniform interval of time).
2. While food output was likely to increase in a series of twenty-five year intervals in the arithmetic progression 1, 2, 3, 4, 5, 6, 7, 8, 9, and so on, population was capable of increasing in the geometric progression 1, 2, 4, 8, 16, 32, 64, 128, 256, and so on.

This scenario of arithmetic food growth with simultaneous geometric human population growth predicted a future when humans would have no resources to survive on.

In order to cater to the needs of fast growing population there is a need for raising our production of food as well. This can be done by developing new technology that is economically, technically and socially feasible.

1.3 Catastrophe of food shortage in 2100

A top scientist from the US Agency for International Development has warned that the world is around 3 decades away from a food shortage that would have serious implications for people and governments.

According to Fred Davis, for the first time in human history, food production would be limited on a global scale by the availability of land, water and energy. Food issues could become as politically destabilizing by 2050 as energy issues are today," he told a gathering at the North American agricultural journalists' meeting in Washington, DC, this week.

According to Davis, the world population would increase 30 percent to nine billion people mid—century. That would call for a 70 percent increase in food to meet demand.

Agricultural productivity, food security, food safety, the environment, health, nutrition and obesity they are all interconnected. One in eight people worldwide already suffers from chronic undernourishment and 75 percent of the world's chronically poor are in the mid-income nations such as China, India, Brazil and the Philippines.

India's population in 2050 is expected to reach 1.7 billion, which will then be equivalent to nearly then that of China and the USA combined.
According to Global Hunger Index (GHI), India ranks 63 out of 78 worst countries in terms of hunger.

1.4 Facts and Figures

1. 17% of India's population is undernourished to live a productive life.
2. India alone accounts for 25% of undernourished people of the world.
3. One in every 3 malnourished children of the world lives in India.
4. About 20 crore of India's population daily sleeps without food.
5. 194.6 million People are undernourished in India.
6. 51% of women between 15 to 59 years of age are anaemic.

The rise in sea levels is linked to three primary factors, all induced by this ongoing global climate change:

1.5 Melting ICE CAPS

Over the past century, the burning of fossil fuels and other human and natural activities has released enormous amounts of greenhouse gases into the atmosphere. These emissions have caused the Earth's surface temperature to rise, and the oceans absorb about 80 percent of this additional heat.

1.6 Melting of glaciers and polar ice CAPS

Large ice formations, like glaciers and the polar ice caps, naturally melt back a bit each summer. But in the winter, snows, made primarily from evaporated seawater, are generally sufficient to balance out the melting. Recently, though, persistently higher temperatures caused by global warming have led to greater-than-average summer melting as well as diminished snowfall due to later winters and earlier springs. This imbalance results in a significant net gain in runoff versus evaporation for the ocean, causing sea levels to rise.

1.7 ICE loss from Greenland and west Antarctica

As glaciers and the ice caps, increase heat is causing the massive ice sheets that cover Greenland and Antarctica to melt at an accelerated pace. Moreover, higher sea temperatures are causing the massive ice shelves that extend out from Antarctica to melt from below, weaken, and break off.

1.8 Possibility of Catastrophic

Predictions say the warming of the planet will continue and likely will accelerate. Oceans will likely continue to rise as well, but predicting the amount is an inexact science. A recent study says we can expect the oceans to rise between 2.5 and 6.5 feet (0.8 and 2 meters) by 2100, enough to swamp many of the cities along the U.S. East Coast. More dire estimates, including a complete meltdown of the Greenland ice sheet, push sea level rise to 23 feet (7 meters), enough to submerge London.
As per above information, most of the parts of world will get submerged in water by 2100. Therefore in order to cater to the necessity of life i.e., food, this threat of rising sea level should be converted into opportunity.

1.9 People are adapting to climate change and fighting food insecurity

For people who live in areas covered by water during the monsoon season, such as the riverside areas of Bangladesh, it is impossible to grow crops. Practical Action has developed a technology to allow farmers to grow food on flooded land.
The floating garden is a clever solution that employs the use of water hyacinth, which is collected to construct a raft. This is then covered with soil and cow dung, in which vegetables can be planted. A new raft needs to be built every year, but the old one can be used as fertilizer during the dry sea.

1.10 Converting threat in to opportunity- the renaissance of farming

1. Less Inputs

Since there is no need for fresh water, fertilizer, or pesticides, restorative ocean farming is the most sustainable form of food production on the planet.

2. Food Security

As a food crop, seaweed is rich in nutrients such as protein, calcium, and vitamin-C. Recent studies demonstrate that a network of seaweed farms the size of Washington State could produce all of the dietary protein needs of the human population.

3. Not just dual but triple advantages

Apart from horticultural, aquaculture can also be done in floating farms. Apart from that the plants grown also results in increasing oxygen. Which benefits to environment too.

4. A Vision for an Oceanic Future

The more use of water surfaces is possible than we do today including not just farming on them, but possibly living on them.

1.11 Deficiency of land is not a big problem

When most of the land of the world would get submerged in water, with that decrease in land it is next to impossible to increase production. But we have developed a technology to turn that impossible possible.

A complementary highly productive floating ecosystem- It is a flexible one able to adapt its dimensions to the local food production needs and can be located close to many mega - cities or dense populated areas with a physical water access (seas lakes-rivers).
We aim to implement a distributed model of food production closer to cities via a series of non-pollutant multi-layer floating platforms which can bring healthy food closer to city populated areas based on renewable energy, thus avoiding logistics and long distance transport. These could be located especially in areas with food-risk associated problems, lack of land, arid regions with water scarcity, with massive food imports or monsoon flooding among others.

1.12 Maritime Farms

It is an innovation in the field of commercial farming. It has been scientifically proven that with minimal resources floating farms could be created on the surface of various water bodies like oceans, ponds, lakes etc.

It is probable that with increasing global warming and the global population boom there will be an acute shortage of food and land. It is expected that a lot of agricultural land and forest area will be converted into housing area as the world population will cross 11 billion (approx.) by 2100 A.D.

1.13 Farm for landless

Floating gardens--a concept which is not new to India thanks to Srinagar's Dal-Lake are farms made on water bodies. Bamboo beds with an average size of 2Oft x 5ft x 1 ft are constructed and floated on the water bodies. At the bottom of the bed surface, dried water hyacinth is intertwined to form a mesh. On this mesh, a 4 inch layer mixture of silt and chopped water hyacinth leaves is made. Above this is a 5-inch layer of a mixture of silt, vermin- compost and farm yard manure. The top most layers are packed with a 3-inch mixture of dry leaves of leguminous plants, soil and silt.

1.14 Floating Farms

The floating farm is a clever solution that employs the use of water hyacinth, which is collected to construct a raft. This is then covered with soil and cow dung, in which vegetables can be planted. A new raft needs to be built every year, but the old one can be used as fertilizer during the dry season.

The rafts, eight meters long and one meter wide, are made from hyacinth which is available for free locally. Soil is put on the surface of the raft and then the seeds planted in the soil. Summer and winter vegetables such as gourd, okra and leafy vegetables are grown.

1.15 Floating farms in world

1. Mexico

The Floating Gardens of Mexico are solving the problem of food shortage and providing food security in Mexico.

2. Brazil

According to PV Magazine, Brazil switched on the first 10 megawatt stage of its floating Ballina plant in March.

3. Singapore

While Singapore might not have much land to spare to grow food, it is surrounded by plenty of water. Barcelona-based architect Javier Ponce has designed what he calls Floating Responsive Agriculture providing some much-needed space to grow food.

4. Bangladesh

Floating gardening is a age old practice in many districts of Bangladesh. It is very common practice in the sudden floodplains of Bangladesh including districts Barisal, Gopalganj, Pirojpur districts.

1.16 Indian floating farms

1. Manipur

The Keibul Lamjao National Park is a national park in the Bishnupur district of the state of Manipur in India. It is 40 km2 (15.4 sq mi) in area, the floating park, located in North East India, and an integral part of Loktak Lake.

2. Jammu and Kashmir

Floating Gardens of Dal Lake: Vegetables appear to have been cultivated in Jammu and Kashmir since time immemorial... Widespread cultivation of vegetables in Kashmir region mostly consisted of Utpalasaka, Sanda (Lettuce), and Kaccha guccha (modern Kaodan).

3. Odisha

The coastal district of Pun in Odisha is infested with water hyacinth. In 1982, 10 million people and 3 million hectares of agricultural land was affected by floods causing the water hyacinth to increase to such an extent that it has affected the lives and livelihood of communities for almost three decades.

According to FAO, "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food for a healthy and active life."

2. Conclusion

The world needs to produce at least 50% more food to feed 9 billion people by 2050. But climate change could cut crop yields by more than 25%. The land, biodiversity, oceans, forests, and other forms of natural capital are being depleted at unprecedented rates. Unless we change how we grow our food and manage our natural capital, food security— especially for the world's poorest—will be at risk.

The U.N. Food and Agricultural Organization has estimated that as many as 550 million people around the world suffer from chronic hunger. That means that as many as one of ten of the world's population do not get enough food to eat.

So there is need to develop innovative and improved techniques to feed the growing population.

3. References

1. www.ecowatch.com
2. www.wikipedia. org
3. www.practicalaction.org
4. www.dailyrnailuk. com
5. www.green wave. org
6. www.fao.org
7. science.howstuffworks.com
8. www.voanews.com
9. www.shutterstock.com