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International Conference on

Agri Biotech & Environmental Engineering

September 11-12, 2017 San Antonio, USA

Risk and reliability based development of near coast and offshore floating platform technology for large scale oceanic macro algae farming

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The project is a socio-economic, environmental, technical sustainability project involving development and the cultivation of macro-algae on a large commercial scale inshore, off coast and offshore towards contributing to the effort to benefit from the carbon sequestration capability of algae and other marine organisms, reduce acidification, improve food security, fuel, pharmaceuticals, animal feed, coral reef and other marine biotech materials etc. The project involved design and installation of offshore aquaculture system as well as incorporating ocean farming estate management with a modular block cultivation system for inshore and offshore use towards improvement of efficiency in macro-algae cultivation. This paper present the use of risk and reliability approach for development of offshore technology to build capability of the traditional breeding method of macro-algae, where modular floating facilities would provide offshore operation, rather than the traditional method that is limited to coastal breeding and suffer from various issues ranging for nutrient requirement, theft, sea concession etc. The system being developed would increase the area of cultivation and stabilized productivity for marine algae supply for various biotechnology products for sustainable development technologies.

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Water: How secure are we?

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Water is central to the environment we live in, essential for the generation of energy we need and vital for growing food for our survival. That is, water is the vital link that connects food to energy and environment. This suggests that water security must be ensured, especially under the specter of global warming and the looming climate change. The questions we ask are: What is the current global water situation? What has happened or is happening to our water bodies and how are we managing them? Answers to these questions depend on the answers to the related questions: What is our water usage? How much water is available? What should we be doing to ameliorate water scarcity if there is one? What are the key issues and challenges for the future? These and related questions will be dealt with in this paper. Finally, a personal perspective on water security and engineering solutions will be presented.

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