Journal of
Marine Science: Research & Development

Chowdhury et al., J Marine Sci Res Dev 2017, 7:2
DOI: 10.4172/2155-9910.1000e145

Editorial OMICS International

Adaptation to Climate Change through Mangrove-Centric Livelihood

Goutam Roy Chowdhury[1] **and Abhijit Mitra**[2*]

[1]*Chancellor, Techno India University, India*

[2]*Department of Marine Science, University of Calcutta, India*

Received date: 18 March, 2017; **Accepted date:** 21 March, 2017; **Published date**: 26 March, 2017

[*]**Corresponding author:** Abhijit Mitra, Faculty Member, Department of Marine Science, University of Calcutta, West Bengal, India, Tel: +919831269550; E-mail: abhijit_mitra@hotmail.com

Keywords: Indian Sundarbans; Salt marsh grass; Prawn feed; Alternative livelihood

Editorial

Climate change is a bitter truth of the present *era*. The issue is also taken up during US presidential election with priority. Seminars are arranged both at the National and International levels with great pomp and splendor. Heated debate occurs between the nations to fix the upper limit of atmospheric temperature. The heat of these debates, the outcome of these hot conversations or the resolutions taken by the nation leaders/representatives cannot touch the poor villagers of Dayapur or Chotomollakahli, which are dominated by mangrove vegetation's, tiger, crocodiles, deer and many other wild fauna [1-3].

These villages are not spotted in the world map, neither the livelihood of the villagers appear on the surface of knowledge due to their location in the remote part of the world, the place known as Indian Sundarbans in the lower Gangetic delta. Bidhan Mondol, a son of this mangrove soil was a poacher, but after witnessing the cruel clutches of AILA (a super cyclone that hit the region in May 2009) now thinks to shift to a new livelihood pattern. Like Bidhan, a large fraction of the people of these islands are thinking to accept new livelihood schemes like home tourism, apiculture, or fish feed preparation from mangrove flora.

It is in this context a study was undertaken by Techno India University, West Bengal at Jharkhali in the central part of Indian Sundarbans during 2015 to find the role of specially formulated feed prepared from *Porteresia coarctata* (commonly known as salt marsh grass) to boost up the growth of fresh water prawn, *Macrobrachium rosenbergii*. This mangrove associate species commonly covers the mudflats of Indian Sundarbans and has considerable protein content. Dried powder of this floral species was mixed with the prawn feed as a source of protein [4-6].

The programme was undertaken as a part of adaptation to climate change in this part of the world where the sea level rise is some 3.14 mm/year. The culture of prawn was undertaken for a period of 8 months and this mangrove-centric livelihood venture witnessed a profit after the completion of the pilot project (Table 1).

	Items	Control Pond (Area=500m^2)	Experimental Pond (Area=500m^2)
Cost	Number of prawn fry	2500	3250
	Prawn fry cost (in INR)	1000	1300
	Feed quantity (in kg.)	336.9	571.35
	Feed cost (in INR)	13476	14283.75
	Experimental cost	6000	6000
	Labor/management cost	2000	2000
	Total cost (in INR.)	25312.9	27405.1
	Total unit cost (in INR/m^2)	50.63	42.16
Benefit	Production return (in kg.)	104	156
	Economic return (@ INR 350/kg)	36400	54600
	Expenditure (in INR)	25312.9	27405.1
	Total Profit/pond (in INR)	11087.1	27194.9
	Profit/unit area (in INR/m^2)	22.17	41.84

Table 1: Cost-Benefit Analysis of the project. Note: INR stands for Indian Rupees.

The Sundarban mangrove region is noted for rich biodiversity and has been declared as World Heritage Site, but the ground-zero observation is alarming. Poaching, erosion, tidal surges, massive wave actions, frequent cyclones, pollution, salinity alterations are the major

hurdles in the matrix of conservation. Lack of organized Institution based approach has aggravated the magnitude of threat in this fragile ecosystem (Figures 1-5). The present programme has immense ecological and economic relevance in connection to these issues in the following ways:

Figure 1: Mangrove dominated Indian Sundarbans.

Figure 2: Sundarbans, the home of Royal Bengal Tiger (*Panthera tigris tigris*). Photo credit: Mr. Biswajit Roy Chowdhury, NEWS.

Figure 3: Prawn seed collection by island dwellers: A major threat to the ecosystem.

Utilization of only the freshwater system (ponds, ditches, rain water harvested canals etc.) and therefore clearance of mangrove areas for the culture of *Penaeus monodon* (shrimp) may be totally avoided [7-9].

Involvement of the local people in organic fish feed cottage industry. Economic upliftment of the local people.

Figure 4: Salt marsh grass *Porteresia coarctata.*

Figure 5: Final harvest of fresh water prawn fed with salt marsh grass based feed.

Conflict of Interest

There is no conflict of interest in context to the present documentation.

Acknowledgement

The authors are thankful to Techno India University, West Bengal for providing the infrastructural facilities and financial support. Ms. Nilaparna Guha Roy, Ishan Ghosh of administration and beloved Kaku of TIU are gratefully acknowledged for providing all the supports required for this study. We are also thankful to Prof. (Dr.) Sujoy Biswas and Mr. Anit Adhikary for streamlining the research team of TIU to fulfill the GRC VISION 2025.

References

1. Banerjee K, Sengupta K, Raha AK, Mitra A (2013) Salinity based allometric equations for biomass estimation of Sundarban mangroves. Biomass & Bioenergy 56: 382-391.
2. Mitra A (2013) In: Sensitivity of Mangrove Ecosystem to changing Climate. Springer p: 323.
3. Mitra A, Zaman S (2014) Carbon Sequestration by Coastal Floral Community; published by The Energy and Resources Institute (TERI) TERI Press, India, ISBN 978-81-7993-551-4.
4. Mitra A, Zaman S (2015) Blue carbon reservoir of the blue planet, Springer, ISBN 978-81-322-2106-7.

5. Mitra A, Zaman S (2016) Basics of Marine and Estuarine Ecology, Springer, ISBN 978-81-322-2705-2.
6. Mitra A, Banerjee K, Sinha S (2011) Shrimp tissue quality in the lower Gangetic delta at the apex of Bay of Bengal. Toxicolo and Environ Chem 93: 565-574.
7. Mitra A, Gangopadhyay A, Dube A, Schmidt ACK, Banerjee K (2009) Observed changes in water mass properties in the Indian Sundarbans (Northwestern Bay of Bengal) during 1980-2007. Current Sci: 1445-1452.
8. Raha AK, Bhattacharyya SB, Zaman S, Banerjee K, Sengupta K, et al. (2013) Carbon census in dominant mangroves of Indian Sundarbans. J Energy Environ Sci (Photon) 127: 345-354.
9. Trivedi S, Zaman S, Ray Chaudhuri T, Pramanick P, Fazli P, et al. (2016) Inter-annual variation of salinity in Indian Sundarbans. Indian J of Geo-Marine Sci 45: 410-415.