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Fisheries sector contributes significantly to the national economy while providing a good source of revenue to approximately 14.49 million people in the country. Climate change involves complex interactions and changing likelihoods of diverse impacts. Fishing and fish farming communities are often characterized by high levels of exposure to natural hazards. Impact of climate change such as droughts, floods, extreme weather events and reduced food and water security affect the livelihood of people in coastal ecosystems with the poorest being the most vulnerable. Evidence of climate-change impacts is strongest and most comprehensive for natural systems on human systems have been attributed to climate change (IPCC 2014). The workloads double or triple during and aftermath of disasters and their livelihood deteriorate with unprecedented challenge of climate change. A study was conducted to identify and analyze the climate change issues in systemic perspective (micro, meso, exo and macro systems) with socio-economic context. A sample of 100 families from 08 villages, two mandals from fishing community was selected based on purposive random sampling. Within the framework of fishing community, the consequences of natural disasters were assessed based on vulnerability index. The needs, problems and gaps in supply chain of fishing community were analyzed by using PRA techniques. The needs were prioritized and identified with the help of high weighed mean scores using Likert's scale. Technological interventions for livelihood security were identified based socio-economic constrains. Suitable adaptation/coping strategies for fishing communities were recommended in the phase of climate change. Seafood value

addition, sea weed and sea shell processing for marine ecosystem; and solar fish processing units, fish preservation units, fish vending units were recommended for livelihood security of fishing community. Co-operative marketing, provision of transport & packaging, logistics, fish byproduct utilization units are recommended through supply chain management for the socio-economic empowerment of fishing community.

SE OR 10

Economic impact of chitin production from shrimp shell waste in Kerala using economic surplus method

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Indian seafood export has been sustained largely by its shrimp exports. The total quantity of frozen shrimp exports during the two-decade of 1995-96 to 2015-16 was 34.35 lakh tones valued at about ₹1.43 lakh crores. In 2015-16, frozen shrimp contributed 40% to the quantity exported and 66% to its value. It is estimated that during the past two decades, the shrimp shell waste generated from the pre-processing units in Kerala was 13.74 lakhs tonnes. One of the products that can be produced from this waste is chitin, the technology of which has been standardized by ICAR-CFIT, Cochin. Chitin is the base material for chitosan which has wide applications in the pharmaceutical and other industries. Chitin production began in the year 1989. The quantity of shrimp shell waste generated depends on the shrimp export from Kerala and this waste forms the raw material for the seven chitin production units in the state. Based on the handling

capacity of existing plants and availability of shrimp shell waste, the chitin production was estimated at around 630 tonnes during the study period (2016) valued at ₹12 crores. In this paper, the Economic Surplus (ES) approach has been applied to study the chitin production in Kerala over 20 years. It has been estimated that the total surplus generated was ₹4798 crore, which is again divided into consumer surplus and producer's surplus estimated at 42% & 58% respectively. It was evident that the producer's surplus was higher than the consumer surplus in chitin production from the aggregate social benefit. This indicates that the enterprise is profitable even if there is increase in the production levels.

SE OR 11

Perception of stakeholders on the cage culture of indigenous fishes in Ashtamudi lake, Kollam, Kerala, India

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The indigenous brackishwater fishes are popular food fishes locally and have reasonable demand throughout the year. Introduction of these species into aquaculture has been limited due to their biological limitations like small size, poor growth rate, low fecundity, etc. A market survey was carried out in three fish markets around Ashtamudi Lake, Kollam (Kavanad, Kundara and Sambranikodi) to assess the price of indigenous fishes and species with a consistent price over Rs. 250/- were selected as potential candidates for cage culture in Ashtamudi Lake. Perception of stakeholders (fishermen, retailers, consumers and cage

farmers) was collected with the help of a pretested questionnaire specifically designed for the purpose. Thirty numbers each of fishermen, retailers and consumers and all the available cage farmers were interviewed for the study from each market area. Pearlsport, *Etroplus suratensis*, a species already being cultured in cages, was the most preferred indigenous fish by all the stakeholders. However, further species preference was strongly influenced by local availability and ecological condition of the area under consideration. A portion of the consumers (up to 23% in Kavanad) preferred live fish over fresh fish and were willing to visit cage farmers to procure cultured fish at a premium price. Most farmers (up to 60% in Kavanad) were already stocking indigenous species in cages at a smaller level and were open to diversifying candidate species for culture. The study shows that the prospects for the expansion of cage culture in brackishwater bodies and diversification to indigenous species are promising.

SE OR 12

Traditional knowledge of fisher folk on the treatment methods for jellyfish envenomation along Palk Bay and Gulf of Mannar

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Gulf of Mannar and Palk Bay are situated along the southeast coast of India, faces swarming of jellyfish population every year in the summer months starting from May to August. There are wide varieties of jellyfishes from non stinging *Crambionella* sp. to