A PERSPECTIVE STUDY ON AQUA CULTURE'S PROBLEMS AMONG COASTAL ANDHRA

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ABSTRACT:

Aquaculture has been a fast-growing industry because of significant increases in demand for fish and seafood throughout the world. Aquaculture plays a significant role in the development of the country economy as well as state economy Coastal environment has undergone rapid change in recent times. Change in the state of the environment is multifaceted, but a key concern is the way that natural habitats the coastal zone is characterized by ambiguities of resource ownership and a complex web of interactions among people, resources and ecosystems. Conflicts exist between the needs of people who may gain from intensification of land use for agriculture and or aquaculture and other people who are Livelihoods may be adversely affected by environmental impacts. Mainly Fish were exposed to any toxicant of different concentrations, due to stress the physiology gets disturbed, thus considerably affects so in this research paper represent the facing various environmental Problems and approaches to managing change in the inland coastal zone in Andhra Pradesh.

Keywords*: Coastal, Demand, Environment, Significant, Toxicants.*

1. INTRODUCTION:

Andhra Pradesh has ranks second in terms of growth in fish production with a CAGR of about eight per cent and with over 13.5lakh tones of fish production annually, the State accounts for over 16 per cent of country's total fish production. West Bengal (4.85 per cent), Tamil Nadu (4.47 per cent), Gujarat (3.37 per cent) and Odessa (3.25 per cent) are certain other leading fish producing states in India which recorded fish Production growth rate between three and four per cent. And in the point of view Aquatic toxicology can be defined as the study of the effects of potentially toxic Chemicals on aquatic organisms, with special emphasis on the harmful effects. Historically, this discipline has used toxicity tests to identify the harmful effects. Standard tests evaluate dose-response relationships (toxicity at different Concentrations) and mechanisms of action in a variety of organisms that are representative of different ecosystem niches. These tests may evaluate the response of individuals or populations to varying concentrations of the chemical. Effects may be of such minor significance that the organism can function normally. However, under stressful conditions (i.e., pH change, low dissolved oxygen, high temperatures,

Changes in hardness, etc.), the same chemical exposure may become very lethal. The toxicity of some chemicals may also be enhanced or mitigated in the presence of other chemicals. In addition to killing the organisms, some pesticides can have negative but non-lethal effects on individual organisms and populations, such as reduced reproduction, reduced mobility to escape predation, or alterations in behavior.

2. OBJECTIVES OF THE STUDY

a. Access the aqua land selective zone
b. Studies on Fish growth and immunology
c. Environmental degradation effects on aqua culture
d. Trace out the effect on economical development on fish formers

3. METHODOLOGY

The degree of toxicity depends on the pH of the water in which the fish resides. Several studies cited in this underscore the point that the pH of the water has a tremendous influence in determining the bioavailability of the metal to the fish and its associated toxic effects. The aquatic toxicology depends on both biotic and abiotic factors. The biotic factors include the type of species, age and developmental stage. The temperature, concentration of Cr, oxidation state of Cr, pH, alkalinity, salinity, and hardness of water constitute the abiotic factors. Moreover, lethal and sub-lethal concentrations of the metal and its speciation also determine the sensitivity of the individual organism. This review papers argue the acute and chronic toxic effects to various fish species in the inland aquaculture of Andhra Pradesh. For this study we collect the data form internet to various relevant recent journals and build the systemic review format.

4. PRODUCTION FOR ECONOMIC DEVELOPMENT

4.1 Livelihoods

The livelihoods of 520 million people depend on fisheries and aquaculture (FAO, 2009a), 98% of who live in developing countries (World Bank, 2005). FAO data reported by the World Bank (2005) indicates that the number of fishers in the world has grown by 400% since 1950, compared with a 35% increase in the number of agricultural workers over the same period. Most of the growth has been in small-scale fisheries in the developing world. It is likely that more poor people will turn to fishing and other common-pool resources in future as a result of the negative impacts of climate change on agriculture and other sectors.

[i]In terms of value, exports of fish from India are likely to reach Rs 16,000 crore by 2015 from the current level of about Rs 13,500 crore. Captured fish accounts for about 70 per cent of India's total fish production annually, while aquaculture accounts for about 30 per cent. India is

the second largest fish producer in the world after China and accounts for nearly six per cent of global fish production of about 180 million tones, said Assocham.

India has over 8,100 kilometers of marine coastline, four million hectares of Reservoirs, two million hectares of brackish water and nearly 51,000 square kilometers of continental shelf area and thus there is a huge scope for developing technology for value addition and infrastructure for fish production through public private partnership, asserts the chamber. Value terms the fisheries sector in Karnataka is worth about Rs 4,000 crore. With over 300 km of coastline and almost six lakh hectares of inland waters, Karnataka has huge scope for further growth and investments in fisheries sector. Incidentally, about eight lakh fishermen are involved in fishing business across Karnataka. Amid leading coastal states in India, Kerala recorded least growth rate of fish production between the aforesaid period as the fish production has come down from about 8.66 lakh tonnes in 2008-09 to the current level of about 6.82 lakh tonnes, said Assocham. Besides, growth of fish production in Maharashtra (0.86%) was also below one per cent as the fish production has fallen from about 5.96 lakh tonnes in 2006-07 to an estimated 5.82 lakh tonnes.

4.2. Ecological Factors for low production in fish forming:

[ii]Despite evidence linking shrimp farming to several cases of environmental Degradation, there remains a lack of ecologically meaningful information about the impacts of effluent on receiving waters. The aim of this study was to determine the biological impact of shrimp farm effluent, and to compare and distinguish its impacts from treated sewage effluent. Analyses included standard water quality/sediment parameters, as well as biological indicators including tissue nitrogen (N) content, stable isotope ratio of nitrogen (δ15N), and amino acid composition of inhabitant sea grasses, mangroves and macroalgae. The study area consisted of two tidal creeks, one receiving effluent from a sewage treatment plant and the other from an intensive shrimp farm. The creeks discharged into the western side of Moreton Bay, a subtropical coastal embayment on the east coast of Australia. Characterization of water quality revealed significant differences between the creeks, and with unimpacted eastern Moreton Bay. The sewage creek had higher concentrations of dissolved nutrients (predominantly NO−3/NO−2 and PO3−4, compared to NH+4 in the shrimp creek). In contrast, the shrimp creek was more turbid and had higher phytoplankton productivity. Beyond 750 m from the creek mouths, water quality parameters were indistinguishable from eastern Moreton Bay values. Biological indicators detected significant impacts up to 4 km beyond the creek mouths (reference site). Elevated plant δ15N values ranged from 10·4–19·6‰ at the site of sewage discharge to 2·9–4·5‰ at the reference site. The free amino acid concentration and composition of seagrass and macroalgae was used to distinguish between the uptake of sewage and shrimp derived N. Proline (seagrass) and serine (macroalgae) were high in sewage impacted plants and glutamine (seagrass) and alanine (macroalgae) were high in plants impacted by shrimp effluent. The δ15N isotopic signatures and free amino acid composition of inhabitant flora indicated that sewage N extended further from the creek mouths

than shrimp N. The combination of physical/chemical and biological indicators used in this study was Effective in distinguishing the composition.

5. TOXICANT BURDEN ON AQUACULTURE

Fish were exposed to any toxicant of different concentrations, due to stress the Physiology gets disturbed, thus considerably affecting the enzyme system. In the Present investigation, toxicity evaluation and behavioral changes were studied.

5.1. Power station effect on aqua culture:

[iii]Aquatic organisms have played important roles as early warning and monitoring systems for pollutant burdens in our environment. However, they have significant potential to do even more, just as they have in basic biology where preparations like the squid axon have been essential tools in establishing physiological and biochemical mechanisms. This review provides a brief summary of the history of aquatic toxicology, focusing on the nature of aquatic contaminants, the levels of contamination in our waters, and the origins of these agents. It considers the features of the aquatic environment that determine the availability of xenobiotics to aquatic life and the fate of foreign chemicals within the organism. Finally, toxic effects are considered with primary emphasis on the potential of aquatic models to facilitate identification of the Underlying mechanisms of toxicity.

[iv]W. K. POKALE studies about Thermal Power Plants have been found to affect Environmental segments of the surrounding region very badly. Environmental deterioration is attributed to emission of large amount of SOx, NOx & SPM & RSPM which disperse over 25 Kms radius and cause respiratory and related ailments to human beings and animal kingdom. At Ramagundam STPS leakage of the ash pond decants was noticed into a small natural channel. This is harmful to the fisheries and other aquatic biota in the water body. Similar findings were noted for Chandrapur.

[v]Widespread occurrence of traces of pharmaceuticals (ng/L to !g/L) has been reported in aquatic systems. However, their effects on the environment and their environmental risks remain elusive. We addressed this question by searching for HC in the literature, and by developing a concept for identification of HC. The suggested mode of action concept is based on (i) the mode of action of the pharmaceutical taking the available toxicological information into account, (ii) the degree of sequence homology between the human drug target and the potential target in aquatic organisms and (iii) the importance of pathways affected by the pharmaceutical. We evaluated the

mode of action concept by comparison to existing approaches, the fish plasma model. Whereas the fish plasma model seemed to be less suitable due to the necessity of environmental concentration above 10 ng/L for the identification of a risk.

5.2 Agro-chemical effect:

Chlorpyrifos (CPF), acommonorganophosphoruspesticide, whichiswidelyusedasan agrochemical for pest control. It causes a serious stressinfresh waterfauna.Itis knownto inhibit acetyl cholinesterase (AChE) in the fresh water field crab Barytelphusa guerini. In this context, we investigated the influence of sub-acute dose of CPF and the duration of exposureon Ache inhibition and subsequent recovery. The effect was estimated at 7, 14, 21 and 28daysofCPFintoxicationonAChEactivityinsensitivetissuesi.e. Gills, muscle, hepatopanc reas and nervous tissue. CPF produced a significant long term inhibition of AChE activity in the crab. On 28th day of exposure the inhibition ranged between 54.2% and 71.2% in different tissues. The inhibition was significantly increased withincreasingtime and was found to be tissue specific. In the experimental period many behavioral Changes such as losses equilibrium, uncoordinated movement andincreaseinthelevels Ofrespiratoryfrequency were observed. In the second part, crabs were exposed to CPF for 28days and then allowed a period of recovery in the clean water. The recovery Animal's tissue samples were harvested at 3,6,9,12,15 and 18days and AChE activity was estimated. Crabstransferredtotoxicantfree water recovered the AChE activity in all the affected tissues up to 95 to 97% of control levels by the end of recovery period.

[vi]Human infections caused by pathogens transmitted from fish or the aquatic Environment is quite common and depend on the season, patients' contact with fis and related environment, dietary habits and the immune system status of the exposed Individual. They are oen bacterial species facultative pathogenic for both fish and human beings and may be isolated from fish without apparent symptoms of the disease. The infection source may be fish kept for both for food and as a hobby. Human infections and intoxications with the following bacteria have been recorded: Mycobacterium spp., Streptococcus iniae, Photo bacterium damselae, Vibrio Alginolyticus, V. vulnificus, V. parahaemolyticus, V. cholerae, Erysipelothrix rhusiopathiae, Escherichia coli, Aeromonas spp., Salmonella spp., Staphylococcus aureus, Listeria monocytogenes, Clostridium botulinum, C. perfringens, Campylobacter jejuni, Delia acidovorans, Edwardsiella tarda, Legionella pneumophila, and Plesiomonas shigelloides. Fish tissue histamine intoxications of people have frequently been described. The purpose of the present paper was to elaborate an overview of significant bacterial causative agents of human diseases Transmitted from fish used as food or by handling them.

6. RISK OF INDUSTRIALIZATION

[vii]Toxicity evaluation of industrial wastewater has been done by using bioassay system of an aquatic plant Lemna minor at different time intervals. Growth inhibition was Measured as reduction in fresh and dry weight in industrial wastewater and sewage Water, exposed L. minor plants. Results of fresh and dry weight indicate significant decrease in industrial wastewater and sewage wastewater during the different seasons of the year. At 72 and 96 hr of industrial wastewater exposure, decrease in chlorophyll content was significant in comparison to control. Decrease in total protein content was 32.5%, 14.7% and 30.6% at 96 hr of exposure in industrial wastewater in premonsoon, Monsoon and post monsoon season. Exposure of industrial wastewater to L. minor shows that it is a highly sensitive plant to the pollutants present in industrial Wastewater.

FINDINGS AND CONCLUSIONS

1. More and more farmers in Andhra Pradesh are shifting to aquaculture if the steady increase in the extent of fish tanks as well as the quantum of inland fishing in the state is any indication.
2. Industrial fluctuates in the catch from the sea is giving strength to the argument that industrialization along the coast is resulting in extinction of fish and other species and posing a threat to the livelihood of traditional fishermen.
3. Promote the Integrated Coastal Areas Management (SPICAM), attributes the growth in inland fishing to the drop in marine fishing.
4. To meet the demand for fish, farmers have ventured into aquaculture. This is an Upward trend, as the demand for fish is ever increasing in the international Market too.
5. Protecting the coast from industrial pollution is the need of the hour to protect the right to life of the fishermen
6. Women farmers are uncommon in shrimp aquaculture. But in coastal districts of Andhra Pradesh of the women are took an active part in shrimp farming. Aquaculture is the main occupation of the women with agriculture as an additional source of employment for most of them.
7. Their major participation was in pond construction, seed segregation and counting, collection of seed, deseeding of the pond, harvesting of shrimp by handpicking, grading (according to size), counting, weighing, icing and deseeding of shrimp.
8. Women had regular employment for 4-5 months in a year in addition to their agricultural employment

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