

Third NEFIS Convention (Nepal Fisheries Society)

ON

"Innovative Aquaculture Technology and Aquatic Resource Conservation"

**A cross-sectoral conference for sustainable livelihoods, food
security, and aquatic ecosystems**

Book of Abstracts

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March 13, 2021 (Falgun 29, 2077)

**Central Fisheries Promotion and Conservation Centre, Balaju,
Kathmandu, Nepal.**

ORGANIZERS



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श्री महेश चन्द गुप्त
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Third NEFIS Convention
on
Innovative Aquaculture Technology and Aquatic Resource Conservation

तथा
वार्षिक साधारण सभा
उद्घाटन सत्र

मिति: २०७७/११/२९ (मार्च १३, २०२१)

स्थान: केन्द्रीय मत्स्य प्रवर्द्धन तथा संरक्षण केन्द्र, बालाजु

उद्घोषक: श्री वैकुण्ठ अधिकारी, महासचिव, नेपाल मत्स्य समाज

समय	कार्यक्रम	जिम्मेवार
६:००-६:३०	नाम दर्ता/ चिया पान	सुमित्रा लौडारी/ मुकुन्द बहादुर थापा/ प्रेम प्रकाश खत्री
६:३०-६:४५	<p>आसन ग्रहण अध्यक्षता: डा. टेक बहादुर गुरुङ्गज्यु, अध्यक्ष, नेपाल मत्स्य समाज प्रमुख अतिथि: माननीय पद्मा अर्यालज्यु, मन्त्री, कृषि तथा पशुपन्छी विकास मन्त्रालय विशेष अतिथि: माननीय डा. दिल बहादुर गुरुङ्गज्यु सदस्य, राष्ट्रिय योजना आयोग विशेष अतिथि: श्री गणेश साहज्यु, पूर्व मन्त्री विशेष अतिथि: डा. योगेन्द्र कुमार कार्की, सचिव, कृषि तथा पशुपन्छी विकास मन्त्रालय विशेष अतिथि: डा. पेम नारायण कंडेल, सचिव, कृषि तथा पशुपन्छी विकास मन्त्रालय विशेष अतिथि: डा. दिपक भण्डारीज्यु, कार्यकारी निर्देशक, नेपाल कृषि अनुसन्धान परिषद् विशेष अतिथि: प्रा.डा. सुबोध शर्माज्यु, रजिष्ट्रार, काठमाडौं विश्वविधालय विशेष अतिथि: डा. दिप बहादुर स्वार, पूर्व सचिव, एवं संस्थापक अध्यक्ष, नेपाल मत्स्य समाज विशेष अतिथि: डा. विमल कुमार निर्मलज्यु, सह- सचिव, कृषि तथा पशुपन्छी विकास मन्त्रालय विशेष अतिथि: डा. हरि बहादुर के.सी.ज्यु सह- सचिव, कृषि तथा पशुपन्छी विकास मन्त्रालय विशेष अतिथि: डा. दमयन्ती श्रेष्ठज्यु, महानिर्देशक, पशुसेवा विभाग</p>	

	<p>विशेष अतिथि: श्री प्रमोद कुमार रिजालज्यू, सह-सचिव, केन्द्रीय मत्स्य प्रवर्द्धन तथा संरक्षण केन्द्र, बालाजु</p> <p>श्री आशा रायमाझीज्यू, मत्स्य अनुसन्धान महाशाखा, नेपाल कृषि अनुसन्धान परिषद्</p> <p>विशेष अतिथि: प्रा. डा. सुनिला राईज्यू, विभागीय प्रमुख, Department of Aquatic Resource, कृषि तथा वन विज्ञान विश्वविधालय</p> <p>विशेष अतिथि: प्रा.डा. चौधरी नागेन्द्र राय यादव, विभागीय प्रमुख, Department of Aquaculture and Fisheries, कृषि तथा पशु विज्ञान अध्ययन संस्थान, त्रिभुवन विश्वविधालय</p> <p>विशेष अतिथि: प्रा.डा. तेज बहादुर थापाज्यू, विभागीय प्रमुख, प्राणी शास्त्र विभाग, त्रिभुवन विश्वविधालय</p> <p>विशेष अतिथि: प्रा.डा. जिवन श्रेष्ठज्यू</p> <p>विशेष अतिथि: माधव बहादुर पन्थज्यू</p> <p>विशेष अतिथि: हृदय नारायण मानन्धरज्यू</p> <p>विशेष अतिथि: अध्यक्षज्यू नेपाल मत्स्य व्यवसायी संघ</p> <p>अतिथि: अध्यक्षज्यू Nepal Agriculture Association</p> <p>अतिथि: अध्यक्षज्यू Nepal Agriculture Federation</p> <p>अतिथि: अध्यक्षज्यू Agronomy Society of Nepal</p> <p>अतिथि: अध्यक्षज्यू Nepal Agricultural Economics Society</p> <p>अतिथि: अध्यक्षज्यू Nepal Agriculture Extension Association</p> <p>अतिथि: अध्यक्षज्यू Nepal Animal Science Association</p> <p>अतिथि: अध्यक्षज्यू Nepal Horticulture Society</p> <p>अतिथि: अध्यक्षज्यू Plant protection society of Nepal</p> <p>अतिथि: अध्यक्षज्यू Society of Agriculture Scientist Nepal</p> <p>अतिथि: अध्यक्षज्यू The IPM Trainers Association Nepal</p> <p>अतिथि: अध्यक्षज्यू Nepal Veterinary Association</p>	
द:४५-द:५०	ब्याज वितरण	सुन्दरी कार्की/NAFSA
द:५०-द:५५	राष्ट्रिय गान	सुभास कुमार झा
द:५५-९:००	स्वागत मन्तव्य: श्री युगल किशोर तिवारीज्यू उपाध्यक्ष नेपाल मत्स्य समाज	

९:००-९:०५	समुद्रघाटन : प्रमुख अतिथिज्यूबाट (सौन्दर्य माछा पोखरीमा स्थापन)	
९:०५-९:३०	कार्यपत्र प्रस्तुती : Status and development trend of aquaculture and fisheries in Nepal	श्री प्रमोद कुमार रिजालज्यू
९:३०-९:३५	इन्दिरा भुषाल स्मृति पुरस्कार बाट पुरस्कृत हुने प्रा.डा. जीवन श्रेष्ठज्यूको परिचय	श्री वैकुण्ठ अधिकारीज्यू
९:३५-९:४०	प्रा.डा. जीवन श्रेष्ठज्यूलाई इन्दिरा भुषाल स्मृति पुरस्कार द्वारा सम्मान	प्रमुख अतिथि बाट पुरस्कार द्वारा सम्मान
९:४०-९:५०	कदरपत्र प्रदान, श्री हृदयनारायण मानन्धरज्यू र श्री माधवबहादुर पन्थज्यू	प्रमुख अतिथि बाट कदरपत्र द्वारा सम्मान
९:५०-९:५५	सम्मानित पुरस्कृत हुने व्यक्तित्व बाट शुभकामना मन्तव्य	प्रा.डा. जीवन श्रेष्ठज्यू
९:५५-१०:००	शुभकामना मन्तव्य विशेष अतिथि: डा. पेम नारायण कंडेल,सचिव, कृषि तथा पशुपन्छी विकास मन्त्रालय	
१०:००-१०:०५	शुभकामना मन्तव्य विशेष अतिथि: डा. योगेन्द्र कुमार कार्की, सचिव, कृषि तथा पशुपन्छी विकास मन्त्रालय	
१०:०५-१०:१०	शुभकामना मन्तव्य विशेष अतिथि: श्री गणेश साहज्यू पूर्व मन्त्री	
१०:१०-१०:१५	शुभकामना मन्तव्य
१०:१५-१०:२०	
१०:२०-१०:२५	मायाको चिनो प्रदान	
१०:२५-१०:३५	प्रमुख अतिथिज्यू बाट मन्तव्य	
१०: ३५-१०:४०	धन्यवाद ज्ञापन र सत्र समापन	डा.टेक बहादुर गुरुङ्ग
१०:४०-११:००	चिया पान	

Technical Session -1

Chairperson: Mr. Sunder Bahadur Shrestha

Rapporteurs: Mr. Subhash K. Jha and Prem Timalisina

11:00-11:15	Status of fisheries and aquaculture research with highlights in innovating new technologies in Nepal : <u>Asha Raymajhi</u> , Prem Timalisina, Hare Ram Devkota, Anita Gautam Md. Akbal Husen , Umita Sah, Mahendra P. Bhandari, Suraj K. Singh, Mohammad Saddam Hussain, Ishwori S. Mahatto
11:15-11:30	Biofloc technology for fish production: <u>Umita Sah</u> , Akbal Husen, Prem Timalisina, Md. Sadam Hassain, Rahul Ranjan, Sumitra Laudari
11:30-11:40	Discussion & Chairperson's remarks
11:40-12:30	Lunch Break

Technical Session -2

Chairperson: Mr. Rama Nanda Mishra

Rapporteurs: Mr. Prashant Sapkota and Ms. Umita Sah

12:30-12:45	Conservation and management of aquatic resources in Nepal: <u>Prabesh Singh Kunwar</u>
12:45-13:00	Recirculating aquaculture system (RAS) and its potential in Nepal: <u>Prem Timalisina</u> , Rahul Ranjan, Subhash Jha, Engineer
13:00-13:15	Aquaculture and fisheries education program in Nepal: Present status and future directions: <u>Prof. Dr. Sunila Rai and Ass. Prof. Dr. Archana Prasad</u>
13:15-13:30	Discussion & Chairperson's remarks
13:30-13:45	Tea

साधारण सभा

बन्दसत्र

कार्यक्रम संचालन : डा. नीता प्रधान

समय	कार्यक्रम	
13:45-17:00	आसनग्रहण अध्यक्ष डा. टेक बहादुर गुरुङ्ग	
	प्रगति प्रतिवेदन : श्री बैकुण्ठ अधिकारी, महासचिव नेफिस	
	आर्थिक प्रतिवेदन : श्रीमती सुमित्रा लौडारी, कोषाध्यक्ष नेफिस	
	छलफल	
	NAFSA को परिचय : रोशनी श्रेष्ठ	
	विधान संशोधन सम्बन्धी अन्तरक्रिया तथा अनुमोदन	
	नेफिस पदाधिकारी निर्वाचन	
	छलफल	
	मन्तव्य धन्यवाद ज्ञापन सहित कार्यक्रम समापन	
17:00-18:00	Snacks	

STATUS AND DEVELOPMENT TREND OF AQUACULTURE AND FISHERIES IN NEPAL

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Abstract

Aquaculture is one of the fastest growing agricultural subsectors, providing employment to about 1.9% population of the country. In fiscal year 2019/20, domestic fish production occupied 93.75% contributing 1.3% to GDP and 4.8% to AGDP while imported fish occupied 6.25% of the total national fish consumption with negligible fish export. The abundant availability of water resource is boon to Nepal and different fresh water habitat makes potential for different fisheries and aquaculture activities. In the last 10 years, there has been an increase of more than 45,320 Mt of fish production from aquaculture in Nepal producing 76,270 Mt fish from aquaculture in FY2019/20 (78.5% of total fish production) and 21000 Mt (21.5%) from capture fisheries. Increased productivity and area expansion of the pond are the major factor for increasing fish production. The terai, especially Province No.2, contributing 55% of total fish production, is the main area of fish production in Nepal. However, cold water species culture is being popular in hilly districts. Fish consumption trend has been doubled since last one decade or so with per capita consumption of 3540 gm. However, lack of fisheries promotion policy, inadequate fish transportation facilities, road infrastructure, fish diseases, financial facilities, research on fish marketing, post-harvest facilities, quality seed on time are major hindrances for aquaculture development.

Keywords: Fish production, pond productivity, employment, per capita production

STATUS OF FISHERIES AND AQUACULTURE RESEARCH WITH HIGHLIGHTS ON INNOVATIVE TECHNOLOGIES IN NEPAL

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Abstract

Aquaculture is facing many challenges notably, epidemic diseases, development of appropriate feeds and feeding mechanisms, hatchery and grow-out technology, brood stock improvement, domestication of endangered fish species as well as improvement of water-quality through mechanization. Since, development in aquaculture technology helps in improvement of traditional aquaculture to better practice for economic growth. Based on these context untiring efforts in research on various aspects have led to succeed in innovative research technologies of fisheries and aquaculture. Main objective was to highlights the present status in research findings of various aspects of fisheries and aquaculture in Nepal. Particularly research findings were based on assess the epidemic of fish diseases and parasites, pathogenic microflora, antibiotic resistant and microbial load on fish fillets. Research has succeed to find the appropriate unconventional feed as partial replacement of shrimp for trout fries. Additionally, technology has developed in reduced the huge mortality of trout eyed eggs and fries during transportation. Concerted research efforts has made to find out superior fish stocks of various population of trout, asala and carp species through genetic characterization. Further, genetically improved

rohu (Janki starain) and all male tilapia production as well as fish-drying technology have developed to expansion.

Keywords: Aquaculture, fisheries, innovative research findings

AQUACULTURE AND FISHERIES EDUCATION PROGRAM IN NEPAL: PRESENT STATUS AND FUTURE DIRECTIONS

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Abstract

Agriculture and Forestry University (AFU) and Tribhuvan University (TU) provide fisheries education in Nepal. AFU offers B.Sc. Fisheries (4 years), M.Sc. Fisheries (2 years) and Ph.D. Aquaculture (3 years) under the Fisheries Program of the Faculty of Animal Science, Veterinary Science and Fisheries whereas TU offers M.Sc. Aquaculture (2 years), Ph.D. Aquaculture (3 years) under the Institute of Agriculture and Animal Science (IAAS) and M.Sc. Zoology (Fish and Fisheries, 2 years) under Central Department of Zoology. The universities aim to produce highly skilled manpower for the development of fisheries and aquaculture in the nation. AFU has got the mandate for teaching, research and extension therefore fisheries curricula are comparatively more practical based and linked to farmers and fishers. AFU has revised its curricula in 2076 and made it advance and relevant for Nepalese context, and is also of international level. Until now 44 students in B.Sc. Fisheries (3 batches), 18 students in M.Sc. Fisheries (4 batches) and 2 students in Ph.D. (2 batches) graduated in AFU. Fisheries education particularly in the undergraduate program gender equality is observed. AFU has a plan to expand its academic program with M.Sc. Fisheries and Ph.D. in Aquatic Resources and add two academic

departments: i) Department of Fisheries Post-harvest Technology and ii) Department of Fisheries Social Science. Ultimate goal is to establish Fisheries Faculty for the overall growth and development of Fisheries education. Similarly, IAAS has a plan to run B.Sc. Fisheries in future. Existing curricula both in the undergraduate and postgraduate fisheries programs have sufficient practical, field works and scope for research to enhance practical and research skill among students but in reality less are carried out. Hindrances in the successful execution of the curricula are inadequate teaching faculty and lab technicians both in quantity and quality and facilities for the lab and field works are not optimum. Coordination and collaboration with CFPCC and NARC can be a way to improve technical capacities of human resources while the infrastructure can be developed with support from the local government. At the moment the most important need is improved academic environment in the academic institutions.

Key word: Aquaculture and fisheries, quality education, research, technical capacities

BIOFLOC TECHNOLOGY FOR FISH PRODUCTION

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Abstract

Biofloc technology (BFT) is a technique of enhancing water quality through the addition of extra carbon to the aquaculture system, through an external carbon source or elevated carbon content of the feed. It is considered as the new blue revolution, because it exploits the proliferation of microorganisms (bacteria, fungi, microalgae and zooplankton) to maintain water quality, excluding pathogens and

providing better nutrition to cultured organisms, which increases the production. Consumption of microorganisms in BFT reduces FCR and consequently costs in feed. Generally BTF is used as 10 thousands litre water capacity with 4 m diameter tank. The size of fish used in biofloc tank was 50-100 g, stocking densities was 600-700 fish/10 thousands litre water and production showed 400 kg/ 10 thousands litre of water. The floc should be needed 25 to 50 ml/l for tilapia and carp production in BTF. In Nepal farmers have started haphazardly establishment of biofloc tank for fish production without any supported proven research document. So, that the research will be necessary to know suitable shape and size of tank, type of probiotics, its dose, type of fish species, its stocking rates, types of feed, amount of feed and water quality parameters in biofloc technology for fish production.

Key words: Biofloc, fish, production, water quality, microorganism

RECIRCULATING AQUACULTURE SYSTEM (RAS) AND ITS POTENTIAL IN NEPAL

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Abstract

Currently, the majority of Nepalese aquaculture is open pond based. The adoption of modern, sustainable, aquaculture technologies and practices – in this case study recirculating aquaculture systems (RAS) – will aid to increase food security and decrease the current reliance on imported fish and stagnant capture fisheries. It will also be helpful to achieve SDG 2, 6 and 14 that focuses explicitly on food security and improved nutrition; access to water and sanitation and life below water (Delete). Secondary literatures were reviewed to variations in RAS system and models in practice; its components and establishment requirements. The RAS could be useful to exploit the resources available in urban areas of country along with its integration in some

parts (forms) of aquaculture. The expansion of RAS as urban aquaculture in Nepal will be timely intervention to cope, water crisis, migration pressure, and supplement of healthy diet to exponentially growing population. Along with this, the tremendous amount of water spent in hatchery operation of fish can be used wisely if integrated with RAS system. Increased awareness, knowledge and skills for fish farmers about RAS and coupling it as aid-on to hatchery as well as nursery will ascertain providing high quality offseason fingerlings and high value fish to specific domain farmers. The RAS could also open way for the expansion of some fish species to mid-hills that have been bound to terai production only. Other sectors in which RAS could be used may be the production of ornamental fishes and backyard fish farming (aquaponics).

Key words: RAS, urban aquaculture, SDG, aquaponics, hatchery, nursing

CONSERVATION AND MANAGEMENT OF AQUATIC RESOURCES IN NEPAL

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Abstract

Nepal is a small Himalayan country blessed with enormous freshwater aquatic resources. Total 828,171 ha water surface area with 252 freshwater fish and 62 shellfish species exist within its territory. These water bodies occupy nearly 5.61 % area of the country. Recent studies in Nepal have reported elevating threats to aquatic biodiversity. Therefore, in this paper we attempt to elucidate some of the major causes and importance of aquatic resource conservation in Nepal. To synthesize the major causes and importance of aquatic biodiversity we searched published reports and articles available online. Many published reports opined that primarily increasing anthropogenic activities like industrialization and developmental projects such as hydropower, irrigation, roads, urbanization and increasing population in general are the main reasons posing the threat to aquatic biodiversity.

There are about 10.8% of the total population of Nepal known as aquatic resource depending communities for livelihood and food and nutrition. However, there are some efforts but inadequate policies, organization structure, skilled scientific human resources, budget and program, are few forefront hurdles for the development of this sub-sector. Furthermore, poor coordination, conflict and confusion among the government authorities have also been noticed as key obstructions. Improvement of the scenario for conservation of the aquatic resources for sustainable utilization is our present needs, which is likely to possible from adopting co-management practices of the aquatic resources, where poor fishers as core stakeholder may take the benefits of the resource management by participating in all steps from program planning to benefit sharing. Constitution of Nepal, 2072 has also visualized such arrangements and provided authority to local governments for resource mobilization. Following these principles community forestry is known to be one of the successful programs in Nepal. Therefore, it is anticipated that by adopting the principles of co-management the fishes from many rivers can be conserved in Nepal. We conclude to conserve aquatic biodiversity especially from riverine habitats and community based river management approach should be applied in near future.

Key words: Aquatic biodiversity, community river co-management, anthropogenic activities, hydropower dams, ecosystem services
