



**Food and Agriculture
Organization of the
United Nations**



FIAA/R1317 (En)

**FAO
Fisheries and
Aquaculture Report**

ISSN 2070-6987

Report of the

**FAO-SHOU INTERNATIONAL PROMOTION PROGRAMME
WORKSHOP ON SOCIAL IMPACT OF RICE-FISH FARMING**

Shanghai, China, 4–8 December 2018

Report of the
FAO-SHOU INTERNATIONAL PROMOTION PROGRAMME WORKSHOP ON SOCIAL IMPACT OF
RICE-FISH FARMING

Shanghai, China, 4-8 December 2018

Required citation:

FAO-SHOU. 2020. *Report of the FAO – SHOU International Promotion Programme Workshop on Social Impact of Rice-Fish Farming, Shanghai, China, 4-8 December 2018*. FAO Fisheries and Aquaculture Report No. 1317, Rome. <https://doi.org/10.4060/ca9907en>

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISSN 2070-6987 [Print]
ISSN 2707-546X [Online]
ISBN 978-92-5-132986-3 [FAO]
© FAO, 2020



Some rights reserved. This work is made available under the Creative Commons Attribution-Non Commercial-Share Alike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/legalcode>).

Under the terms of this licence, this work may be copied, redistributed and adapted for non-commercial purposes, provided that the work is appropriately cited. In any use of this work, there should be no suggestion that FAO endorses any specific organization, products or services. The use of the FAO logo is not permitted. If the work is adapted, then it must be licensed under the same or equivalent Creative Commons licence. If a translation of this work is created, it must include the following disclaimer along with the required citation: "This translation was not created by the Food and Agriculture Organization of the United Nations (FAO). FAO is not responsible for the content or accuracy of this translation. The original [Language] edition shall be the authoritative edition."

Disputes arising under the licence that cannot be settled amicably will be resolved by mediation and arbitration as described in Article 8 of the licence except as otherwise provided herein. The applicable mediation rules will be the mediation rules of the World Intellectual Property Organization <http://www.wipo.int/amc/en/mediation/rules> and any arbitration will be conducted in accordance with the Arbitration Rules of the United Nations Commission on International Trade Law (UNCITRAL).

Third-party materials. Users wishing to reuse material from this work that is attributed to a third party, such as tables, figures or images, are responsible for determining whether permission is needed for that reuse and for obtaining permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

Sales, rights and licensing. FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org. Requests for commercial use should be submitted via: www.fao.org/contact-us/licence-request. Queries regarding rights and licensing should be submitted to: copyright@fao.org

PREPARATION OF THIS DOCUMENT

This report describes the activities and outputs of the FAO-SHOU International Promotion Programme Workshop on Social Impact of Rice-Fish Farming, held in Shanghai, China from 4 to 8 December 2018.

This document was prepared by Ms Roxane Misk and Ms Yin Fu, FAO interns, in collaboration with Mr Oluwafemi Ajayi (FAO consultant) and Mr Lionel Dabbadie (FAO consultant) under the coordination of Mr Xinhua Yuan (Senior Aquaculture Officer, FAO) and Mr Matthias Halwart (Head of the Aquaculture Branch, FAO), with contributions from Mr Tang Yi, Ms Helen Zhu, Ms Zhang Wen, Ms Shen Qinghui, Ms Wen Ya from Shanghai Ocean University.

ABSTRACT

The Food and Agriculture Organization of the United Nations (FAO) and the Shanghai Ocean University (SHOU) convened the workshop “International Promotion Programme on Social Impact of Rice-Fish Farming” from 4 to 8 December 2018 in Shanghai, China. The workshop was attended by 17 international experts and 39 Chinese experts, including representatives from the Chinese government, academia and cooperating organizations.

Integrated aquaculture practices such as rice-fish farming, have proven to make valuable contributions to sustainable development in many places around the world, especially with small-scale stakeholders. However, the extent of the social impacts of rice-fish farming practices needs to be better assessed and documented. The main objectives of the workshop were: i) to provide an exchange platform for a better understanding of the social impact of rice-fish farming worldwide; ii) to examine various dimensions of the social impact of rice-fish farming, such as poverty reduction, traditional/indigenous arts and cultures, nutrition and gender equity and equality; and iii) to increase the awareness on the social impact of innovative agro-aquaculture systems.

This document summarizes the preparation, process and conclusions of the workshop.

CONTENTS

PREPARATION OF THIS DOCUMENT	iii
ABSTRACT.....	iv
ABBREVIATIONS AND ACRONYMS	vi
INTRODUCTION	1
OPENING CEREMONY.....	2
WORKSHOP CONTENT	3
Keynote Speech Session	3
Side-Event: “Flash presentation of young scientists”	4
Session 1: “Social dimensions of rice-fish farming in Uganda, Indonesia, Madagascar and Vietnam”. 5	
Session 2: “Rice-fish farming in Lao PDR, Kenya, Madagascar and China”	6
Session 3: “Ecological and economic dimensions of rice-fish farming in China and Vietnam”	6
Session 4: “Social and ecological dimensions of rice-fish farming”	7
FIELD TRIP – ZHEJIANG PROVINCE	7
Itinerary.....	7
Brief description of the GIAHS site in Qingtian.....	7
CONCLUSIONS AND RECOMMENDATIONS	8
REFERENCES	9
APPENDIX 1 - List of participants (alphabetical order)	10
APPENDIX 2 – Workshop Agenda.....	14
APPENDIX 3 – Side Event Agenda	16
APPENDIX 4 – Photographs.....	17

ABBREVIATIONS AND ACRONYMS

APDRA	Association Pisciculture et Développement Rural en Afrique
BoF	Bureau of Fisheries, Ministry of Agriculture and Rural Affairs, China
Cirad	Centre de coopération Internationale en Recherche Agronomique pour le Développement
FAO	Food and Agriculture Organization of the United Nations
GIAHS	Globally Important Agricultural Heritage System
IAA	Integrated Agriculture-Aquaculture
IRRI	International Rice Research Institute
Lao PDR	Lao People's Democratic Republic
MARA	Ministry of Agriculture and Rural Affairs
NACA	Network of Aquaculture Centres in Asia-Pacific
NARO	National Agricultural Research Organisation
RESPA	Research Partners Africa
RFFS	Rice-Fish Farming System
RMB	Renminbi
SHOU	Shanghai Ocean University
SOFIA	The State of World Fisheries and Aquaculture

INTRODUCTION

1. Integrated rice-fish farming has been documented and put into practice globally, especially with small-scale farmers, and has been shown to improve the productivity, economic return and gender equality in rural areas. Although an ancient practice in some locations, innovation and adoption in new areas has continued. Today, it is considered a type of agroecological approach. Rice-fish farming produces two products from a single plot of land, and increases the income generated by the same volume of water. Fish thrive in rice paddies, and provide fertilization through their excrement, provide plant protection by eating insect pests and improve water quality by increasing oxygenation. Producing fish in rice fields can increase rice yields by up to ten percent, despite allocating a certain amount of area as fish refuges. This extra production of fish provides both more food for the family, as well as additional income through sales at market. The additional harvest of fish increases dietary diversity, and can provide an excellent source of proteins, contributing to health improvements especially in rural areas.

2. Rice is grown in about 113 countries around the world, in a wide range of agroecological conditions and water management regimes. A majority of this cultivation is done in irrigated, rain fed and/or deep-water systems that offer a suitable environment for fish and other aquatic organisms. Over 90 percent of the world's rice, equivalent to approximately 134 million hectares, is grown under such flooded conditions providing not only a home to a wide range of aquatic organisms, but also offering opportunities for their enhancement and culture (Halwart and Modadugu, 2004). Rice-fish systems contribute to food security, improved nutrition, income generation, prevention of malaria as mosquito larvae are predated by fish, conservation of biodiversity through reduction of pesticides, pest regulation by fish predation and the establishment of beneficial carbon and nutrients cycles. These systems can thus reduce exogenous pesticide and fertilizer application, which are a threat to human health, other species and the environment.

3. Some rice-fish systems have been designated as Globally Important Agricultural Heritage Systems (GIAHS) www.fao.org/giahs/en/, recognizing both their cultural and agricultural importance. These systems generate both economic and social benefits for local communities by supporting essential ecological functions and providing multiple goods and services. Rice-fish systems are not merely a production method, it is also a whole cultural heritage. In the tombs of the mid-Eastern Han Dynasty (25-220 CE), two clay models were unearthed: a model of a pond and a model of a rice field. The pond model contained 15 miniature pieces (six common carp, one soft-shell turtle, three frogs, and five water chestnuts) which underlines the importance of integrated agriculture aquaculture already 2000 years ago. Cultural activities like traditional rice-fish dance or traditional recipes are also the outcomes of fish systems, and further highlight their importance. In China, most rice fields are small, and therefore farmers' cooperation is essential for their collective management; in some cases rice growers and fish farmers cooperate in the same paddy to implement the integrated system.

4. In 2016, Professor Qigen Liu from Shanghai Ocean University (SHOU) launched a cooperation with the Qingtian Zhejiang Yugong Ecological Agriculture Science and Technology Company to help enterprises optimize rice-fish farming practices, and improve the economic, ecological, and social benefits of the rice-fish system. Through further cooperation with the Qingtian county government, Professor Liu and his team helped the local government in carrying out the protection of this important agricultural cultural heritage by providing technical support. This led Professor Liu to formulate the "Qingtian field fish elite germplasm" standard, which proposes technological solutions for establishing a symbiotic system for the Qingtian rice-fish farming while increasing the fish diversity in the fields. Research on the special ecological habits of these fish provided a better understanding of their adaptability to ricefield habitats, such as shallow water and temperature fluctuations. To document these unique farmed types of valuable aquatic genetic resources,

Professor Liu and his team carried out studies on breeding and the ecological relationships between the fish and rice. These methods and technologies will also be extended to China's mountainous areas in the future.

5. SHOU¹ is also supporting the conservation and development of rice-fish farming and promoting the implementation of the strategy for rejuvenating villages, especially the ones traditionally known for farming fish. With support from FAO, it provides technical and financial support to promote global aquaculture, with the objective to encourage the exchange of knowledge and experiences related to identification, documentation and dynamic conservation of fish culture practices, especially through by highlighting the social impact, and supporting the people involved in these practices.

6. The FAO has been promoting innovative agro-aquaculture systems worldwide for a long time. In 2017 and 2018, FIAA organized two workshops on innovative agro-aquaculture in China and France respectively, focusing on sustainable Integrated Aquaculture-Agriculture (IAA) (FAO, 2019a/FAO, 2019b). The new International Promotion Programme on Rice Fish Farming will provide an exchange platform for scholars, researchers and government officers to exchange technical information and identify new trends, as well as to better understand the social impacts on stakeholders.

OPENING CEREMONY

7. The opening ceremony of the "International Promotion Programme Workshop" was chaired by Mr Yang Zhengyong, Director of the Division of Science and Technology of SHOU, who extended a warm welcome to the participants of the workshop.

8. The workshop was well presented with invited experts from France, Japan, Indonesia, Lao People's Democratic Republic, the Philippines, Uganda, Viet Nam as well as FAO, the Network of Aquaculture Centres in Asia-Pacific (NACA), WorldFish, and officials from the Bureau of Fisheries, the Ministry of Agriculture and Rural Affairs (MARA) China, and co-chair of GIAHS Scientific Advisory Group from the Chinese Academy of Sciences (CAS). In addition, more than 50 faculty members, students and participants from Qingtian County People's Government of Zhejiang Province, from its Agricultural Bureau and Crop Management Station, Congjiang County Fisheries Station of Guizhou Province, Yunnan Zhonghai Fisheries Company Limited, the Sichuan Academy of Agricultural Sciences, and the Shanghai Ocean University also participated in the workshop. A full list of participants is provided as Appendix 1.

9. On behalf of SHOU, FAO and NACA respectively, Mr Li Jiale, vice president, Mr Matthias Halwart, FIAA branch head, and Mr Cherdasak Virapat, Director General, welcomed the participants and congratulated SHOU for the successful organization of the conference.

10. Mr Li Shumin, Deputy Director-General of the Bureau of Fisheries, MARA, delivered the introductory speech. He presented China's practices and achievements in promoting rice field integration with aquaculture. He also highly appraised the outstanding contributions made by Professor Wang Wu and Professor Cheng Yongxu of the SHOU in promoting crab and shrimp cultivation in rice fields.

¹ Shanghai Ocean University is the oldest fisheries university in China. Cooperation between SHOU and FAO dates back to the early 1980s. In 2016, SHOU officially signed an agreement with GLOBEFISH of the Department of Fisheries and Aquaculture of FAO, and under this cooperation framework, visiting scholars and interns from SHOU have worked with FAO. In the meantime, FAO fisheries and aquaculture officers have been invited to lecture in SHOU. On 14-15 December 2017, the Regional Workshop on International Fish Trade, Markets and Governance was successfully held in Shanghai Ocean University. The International Trade Conference of Aquatic Products also took place in SHOU in 2018, and SHOU co-hosted the FAO-sponsored ICES Working Group on Fishing Technology and Fish Behaviour in 2019.

11. The opening ceremony was concluded by a signing ceremony, which rendered official the cooperation agreement between SHOU and the government of Qingtian County in the Zhejiang province. A comprehensive list of photographs can be found in Appendix 4.

AGENDA AND CHAIRPERSONS

12. The Agenda is presented in Appendix 2. The International Promotion Programme Workshop was organized in five regular sessions and one side event for young scientists.

- Mr Yang Zhengyong chaired the session dedicated to the keynote speeches and welcomed remarks
- Mr Xinhua Yuan chaired session 1 on “*Social dimensions of rice-fish farming in Uganda, Indonesia, Madagascar and Viet Nam*”
- Mr Tang Yi chaired session 2 on “*Rice-fish farming in Lao PDR, Kenya, Madagascar and China*”
- Mr Michael J. Akester chaired session 3 on “*Ecological and economic dimensions of rice-fish farming in China and Vietnam*”
- Mr Tan Hongxin, chaired session 4 on “*Social and ecological dimensions of rice-fish farming*”
- Ms Zhiyi Zhang chaired the young scientists’ side event.

WORKSHOP CONTENT

Keynote Speech Session

13. Mr Xinhua Yuan introduced Mr Endo Yoshihide, Coordinator of GIAHS at FAO, who presented a video on “progress of GIAHS programme and cases of aquaculture culture heritage”. Mr Yoshihide presented the concept, operation and programme of GIAHS through case studies in Algeria, Bangladesh, China, Japan, Mexico, Spain and the slope of Mt. Kilimanjaro between Tanzania and the border of Kenya. He stressed the importance of GIAHS sites and introduced some possible measures of Action Plans for dynamic conservation, including enhanced awareness and information dissemination of the GIAHS and the GIAHS sites, improvement of systems and frameworks to implement an action plan, amelioration of management of agricultural resources and infrastructures, conservation and sustainable use of agrobiodiversity, and sales promotion of the agriculture products. Mr Yoshihide also introduced national systems in some countries to promote GIAHS.

14. Mr Min Qingwen, Professor at Chinese Academy of Sciences, introduced the “Chinese GIAHS sites and promotion programme” with a focus on the social effects of the GIAHS Site Qingtian Rice-Fish Culture Systems. These include: the development of both Qingtian’s rice and fish industry and Qingtian’s leisure agriculture; the improvement of local eco-environmental quality and the cultural consciousness and self-confidence of local farmers who participate in rural economic development, leading to poverty alleviation; and the promotion of women’s status and role in aquaculture, the rice-fish culture and the concept of GIAHS. Mr Min concluded that, from the point of GIAHS, Qingtian Rice Fish System is not only a sustainable economic system but also an ecological and cultural system, and the experiences of Qingtian Rice Fish-Culture system in the last 13 years demonstrated that GIAHS is not about the past but about the future.

15. Mr Matthias Halwart, Head of the Aquaculture Branch, FAO made a presentation on the “Global innovative agro-aquaculture system and its social contribution”. After summarizing the main findings of the recently published “The State of World Fisheries and Aquaculture” (SOFIA, 2018), he described the FAO Common vision for Sustainable Food and Agriculture, which aims at providing solutions to face the challenges of the future global demand for food. He also presented the main findings of a workshop held in Montpellier, France on 25 August 2018 on advancing integrated agriculture-aquaculture through agroecology. Practices such as rice-fish farming, offer key solutions to ensure future food supply at the local and global levels, by responding to and considering the local challenges. Thus, FAO promotes rice-fish systems for their efficient resource use and enhanced biodiversity. However, he also emphasized the need to determine the specific constraints that small-scale farmers face and to document the transition process from conventional aquaculture practices to an agroecological integrated aquaculture-agriculture (IAA) system. Mr Halwart finally stressed the need for a holistic assessment of the relationships between IAA, environment and society and the consideration of the social impacts of these innovative agro-aquaculture systems. This includes decent livelihoods, poverty reduction, good nutrition, capacity development and cultural diversity but also human health and gender equity and equality, which includes the triple work burden of women and their lack of recognition in aquaculture.

16. Mr Michael Akester, Myanmar Country Director at WorldFish presented on the “Nutrition-sensitive fish-rice food systems”, stressing the global importance of fish in terms of production, livelihoods and economy but also in terms of human health and nutrition. To tackle “hidden hunger” in the world, consisting in chronic lack of vitamins and minerals and leading to eventual mental impairment, poor health and productivity or even death, scientists must take nutrition into consideration. From Africa to Asia, WorldFish has discovered that fish-rice systems, with diverse species and variety, are more productive in supplying well-liked, nutrient-rich, safe and affordable foods for the most vulnerable groups, especially women and children. Therefore, rice-fish systems deliver key outcomes in regard to nutrition.

Side-Event: “Flash presentation of young scientists”

17. Ms Roxane Misk, Ms Yin Fu and Mr Oluwafemi Ajayi presented their respective work for FAO, and Mr Zongli Zhang from Nanjing Agricultural University and Ms Wenjing Hu, Mr Jinghao Li, Mr Haisong Guo, Mr Idrissa Diedhiou, Ms Samia Fawzy, Mr Lonqi Sun and Ms Zhiyi Zhang presented their research for SHOU. The presentations addressed a wide range of topics on the social impacts of rice-fish farming, which included gender equality and equity, community public health, and nutrition research frameworks. Mr Halwart, Mr Yuan and Mr Dabbadie also attended the event. Appendix 3 includes the agenda of the side event.

18. Ms Roxane Misk presented on the “Gender dimensions of rice-fish farming”. She introduced the concept of gender as it is interpreted at FAO, namely cross-cutting themes in FAO’s Strategic Programmes and the Sustainable Development Goals of the 2030 Agenda that should be mainstreamed in all areas of FAO’s work (FAO, 2013). This complex concept allows one to (re)think and analyze the social construction of the sexes, built by a set of social norms, customary laws, beliefs, cultures and traditions shaping the fluctuating perceptions of femininity and masculinity in a socio-geographic context. In order to better address gender inequalities and the triple work burden (FAO, 2015) women face in aquaculture, there is a need to conduct gender analysis to understand the gender-division of labour and gender-based constraints in accessing resources, assets, services, credits, technologies and innovations, knowledge, participation, leadership and decision-making roles. Diversified agricultural production systems such as rice-fish farming provides opportunities for women to empower themselves at the workplace, household and community levels, as they require additional labour inputs allowing to increase their income and strengthening their decision-making power. Rice-fish farming generates economic and social benefits for women, men, boys and girls.

19. Ms Yin Fu presented the “Public health nutrition aspects of the rice fish farming system”. In line with both Sustainable Development Goal 2 and 3, rice-fish farming can positively contribute to ending hunger, achieving food security and improved nutrition, as well as promoting healthy lives and well-being. Ms Fu recalled that the reduction of serious vector-borne diseases such as malaria and schistosomiasis has been reported by FAO, as well as the reduced use of chemical residues that lead to a decreased toxicity. However, the fish borne trematodes could pose a serious public health concern. She also reported two case studies in Malawi and Uganda, on fish as an ingredient in nutritional interventions, which highlighted the nutritional value of fish. Challenges for further studies, such as better nutritional indicators and processing methods, were also mentioned, in order to have appropriate policies and effective food-based approaches to further improve the public health nutrition of the community.

20. Mr Ajayi gave a presentation on the components of rice-fish systems that enhance community nutrition security. He drew attention to the dietary diversity and nutrients that could be derived from the combination of fish, rice and other varieties of food purchased from money earned from the sale of surplus rice and fish (proteins, carbohydrates, vitamins, minerals and polyunsaturated fatty acids). Consequently, access to these nutritious foods comes with attendant social benefits in the forms of reduction in the rate of malnutrition and micronutrient deficiencies, and increased health and economic productivity of the community. Interdependent connections between extension services aimed at promoting good farming practices, farmer adoption of farming practice, local food systems and food policies, nutrition education and awareness programmes, were identified to be the enabling factors that could make the social benefits far-reaching within the community.

Session 1: “Social dimensions of rice-fish farming in Uganda, Indonesia, Madagascar and Vietnam”

21. Mr John Walakira, Senior Research Scientist, Uganda presented a case study on “Poverty reduction by adoption of rice-fish farming in Uganda”. Uganda is a low-income country with rich natural resources, and it has the potential to become a mid-income nation soon. Mr Walakira explored successes, challenges and recommendations of integrated rice-fish systems during participatory experimental studies conducted in eastern Uganda. The social benefits of integrating rice with fish were highlighted, especially with regards to poverty reduction, enhanced food security, the conservation of indigenous arts and culture, gender equality and transformative agribusiness capability for youth.

22. Mr Ronnie S. Natawidjaja, Professor at Padjadjaran University, Indonesia, gave a lecture entitled “Rice-fish farming system contribution to the income and food security of farm households”. The programme aims at optimising the use of existing land in Indonesia, in order to increase farmers' income and the food security of their households. This study aims at determining the contribution of the RFFS income to farm households' income in Indonesia, analyze the level of household food security of RFFS farmers and analyse the affecting factors of Food Expenditure Share.

23. Mr Lionel Dabbadie, Cirad, France presented the “Social impact of rice-fish farming in Madagascar”, which summarised the findings of a survey on gender and poverty in two Malagasy villages practising rice-fish farming. He concluded that integrated rice-fish farming has the potential to provide access to high quality food in remote areas, to contribute to diversity of diet and nutrition, and to enhance rice production and household income. However, the local constraints of poor people need to be better understood for this to happen and IAA to deliver its benefits. He also commented that there was no one-size-fits-all approach in addressing poverty alleviation and gender issues, but an adaptive approach that considers the different constraints faced by communities.

24. Ms Thelma Paris, Retired Scientist at IRRI Philippines presented a work on “Rice-fish farming observation in the Mekong River”, focusing on the gender dimensions of the rice-shrimp culture in the

Mekong basin. Ms Paris pointed out that benefits from rice-shrimp production may foster improvements in economic and social equality, and the objectives of the study are to explore the gender dimensions of the rice-shrimp culture in the Mekong basin and enhance the visibility of women's work and their constraints. Policy recommendations to strengthen the capacity of national stakeholders were also provided, in order to improve the social impact of development interventions.

Session 2: “Rice-fish farming in Lao PDR, Kenya, Madagascar and China”

25. Mr Vannaphar Tammajedy, Deputy Director, Ministry of Agriculture and Forestry, Lao People's Democratic Republic presented the “Social impact of rice-fish farming in Lao PDR” and introduced the *Lum Pa* System, a national heritage rice-fish farming system from Attapeu province, by focusing primarily on community perspectives. As a part of traditional knowledge, the Lum Pa system can better tackle the challenges of poverty reduction, climate change, accelerate environmental degradation and food security. The system's potential for adaption and expansion was also highlighted.

26. Mr Francis Akstsa Okalo, Researcher, Research Partners Africa (RESPA), Kenya, prepared a presentation on “Integrated rice-fish production in Kenya: opportunities and future perspectives”, reporting Kenya's growing recognition and acceptance of integrated rice and fish production. The aim is to diversify the livelihoods of poor farmers in different regions, and to ensure gender inclusivity for societal well-being. Research, provision of technical services and actualisation were proposed as the most effective ways of ensuring full adoption. In addition, exchange programmes and collaborations with international organizations and countries like China, which has a long tradition of rich-fish culture, were also vital.

27. Ms Delphine Lethimonnier, Operations Manager, Association Pisciculture et Développement Rural en Afrique (APDRA), France delivered a presentation entitled “Traditional knowledge and innovation analysis: rethink the contribution of rice-fish farming towards food security in Madagascar” by stating that rice-fish farming contributed towards food security in Madagascar and suggested to make rice-fish farming systems more inclusive for populations with poor food security. Therefore, APDRA and its partners were exploring new approaches to promote rice-fish farming among vulnerable farmers.

28. Ms Xiao Yanni, General Manager, Zhonghai fishery, Yunnan Province, China gave a presentation on “Social impact of rice- fish farming in Honghe Hani terraced fields”. Hani Terrace in Yunnan Province was listed by FAO as the 45th GIAHS in 2013 and was awarded the status of “Integrated Rice-Fish System Reference Center” in 2017. Its various achievements, especially on poverty alleviation, were included in the presentation as well as its future development plans.

Session 3: “Ecological and economic dimensions of rice-fish farming in China and Vietnam”

29. Ms Chen Xin, Professor at Zhejiang University, told the “Ecological story from rice-fish systems” by describing the ecological mechanisms and interactions underlying the high genetic diversity in rice-fish systems. Ms Chen and her team have conducted long term research on rice-fish systems in Qingtian, Zhejiang Province and provided many details about the systems. Based on the ecological story, she suggested that sustainable rice-fish system development needs novel technology and the support of science explaining why and how rice-fish systems can be sustainable.

30. Ms Phan Thi Thu, Head of Southern Sub-Institute of Fisheries Economics and Planning, Ho Chi Minh City, Viet Nam presented “The effectiveness of shrimp-rice cultivation models in Mekong Delta”, describing the socio-economic and environmental sustainability of the models and stressing gender roles and profitability of the system which was found to generate a more than a 100 percent return on investment

compared to rice-rice farming. Ms Phan Thi Thu also pointed out some disadvantages in implementing the shrimp-rice models, such as low-level knowledge of technology and management.

31. Ms Liu Ya, Research Assistant, Sichuan Academy of Agriculture Sciences gave a presentation on “The contribution of rice-fish farming in new countryside construction of Sichuan Province of China”. She described the policy support and capacity development involved in the implementation of rice-fish farming in the province and gave some economic development indicators in terms of cumulative promotion area, production output and increased income per hectare of rice-fish farming.

Session 4: “Social and ecological dimensions of rice-fish farming”

32. Mr Cheng Yongxu, Professor at SHOU, China, gave a presentation entitled “Rapid development of integrated rice-fish, rice-mitten crab and rice-crayfish farming in China”. He described the successful transition from the traditional rice-fish co-culture to the integrated farming of rice and high-value aquaculture animals in China. Further, he detailed the various supporting technologies employed to improve the economic performance of the system for pest and weed control, fertilization, field engineering, and high-quality feed production. He concluded by highlighting the positive economic performance and increased profitability of the various integrated rice and aquaculture animal models.

33. Mr Masayuki Kurechi, President of the Japanese Association for Wild Geese Protection and co-president of the Ramsar Network Japan, Japan gave a presentation on the “Challenges of the implementation of the Rice Paddy Resolution of Ramsar² and the activity at Kabukuri-numa and surrounding rice paddies, New Concept Ramsar Site, Japan”. He described the benefits of wildlife in rice paddies for habitat recovery, highlighting good practices for enhancing biodiversity, weed and pest control, and associated positive environmental impacts.

34. Mr Luo Jun, Assistant Fisheries Engineer, Bureau of Agriculture in Congjiang, Guizhou Province, China made the last presentation on “Ecological wisdom of rice-fish-duck integration in Dong village, Congjiang, Guizhou”. Mr Luo explained the historical trends, rules and regulations, and management systems put in place to ensure accountability, equity, and provision of safety nets for farmers to guard against theft and other forms of losses.

FIELD TRIP – ZHEJIANG PROVINCE

Itinerary

Time	Activities
08:30	Rice-fish co-existence museum
09:30	Fangshan Township School
10:30	Longxian Village—Key Protection Zone in GIAHS Rice-fish Co-Existence System
13:30	Stone Carving Museum

Brief description of the GIAHS site in Qingtian

35. Qingtian is located in the southeast of Zhejiang province, China. In June 2005, the Qingtian “rice-fish coexistence system” was designated and included into the first batch of GIAHS by FAO. It was the first of its kind in China. Qingtian is a place that presents a morphological structure that is 90 percent mountainous, 5 percent water and 5 percent rice fields. The county is well known for its stone carving

² The Ramsar Network is situated within the Convention on Wetlands, an intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources, adopted in Ramsar, Islamic Republic of Iran in 1971. <https://www.ramsar.org/>

tradition and for having a high number of its residents living abroad, but also for its abundance of carp. Rice-fish farming in Qingtian has a 2 400 year history. This traditional custom has allowed a particular carp farmed type, the Qingtian Carp, to emerge and proliferate in the area. This Qingtian Carp has also been recognized as a national geographical trademark and is unique because of its rich body colour, tender flesh, soft and edible scales and delicate taste. Therefore, culturally important events, dances and handicrafts such as “New Rice Testing”, “Ancestor and God Propitiation” and “Qingtian Fish Lantern” were born.

36. The “rice-fish co-existence system” has allowed the development of many products. The Qingtian fish and rice have both been certified as green and organic food. The smoked Qingtian carp was recognized as a protected eco-product with specific origin. In 2017, the total farming area of the best-selling Qingtian rice was 1 500 mu³ with an annual production of 375 tonnes and an income of RMB7 million. In 2018, the area expanded to 3 000 mu to reach an annual production of 750 tonnes and an income of RMB15 million.

37. The visiting group was offered a performance by students of the Fangshan Township School, which covers primary and advanced level of education. This school has a student performance team for the “Qingtian fish lantern” festival, which depicts the local rural traditions and culture. The exhibition center for Agrarian culture is also implanted in the school area. It is a place that exhibits living style, tools, utensils, equipment and furniture which have been used in ancient agrarian ages. At the end of the visit to the school, each guest received handmade gifts from school students depicting various elements of rice-fish farming system (special thanks to the Education and Exhibition Center for Agrarian Culture for the visiting activities).

38. The rice-fish farming system exists in 80 percent of Fangshan’s rice fields. Longxian village is designated as the key protection zone in GIAHS Rice-fish Co-Existence System, well known as “China Carps village”. It has a population of 1 400 and more than 700 registered residents live abroad. Many foreign country flags are displayed on the houses, to indicate the country from which the owner is. There is an area of rice terraces where a comprehensive explanation of the rice-fish farming system is depicted. The natural environment, with more than 500 mu of farming land and 140 fishing ponds, provides a suitable living environment for rice and fish farming.

CONCLUSIONS AND RECOMMENDATIONS

39. FAO and SHOU were the co-organizers of the “International Promotion Programme Workshop on Social Impact of Rice Fish Farming”. The main objectives of the workshop were: 1) to provide an exchange platform to better understand the social impact of rice-fish farming worldwide, by examining various aspects of the social impact of rice-fish farming, including poverty reduction, traditional and indigenous cultures heritage, nutrition, and gender equity and equality; and 2) to raise awareness on the importance of social impact in innovative agro-aquaculture systems. Rice-fish farming was highlighted as an innovative agro-aquaculture integration system, which should be promoted in many major rice-planting countries/areas, especially with small-scale stakeholders. The reports by participating experts from all over the world confirmed that these systems do not only provide a double harvest of rice and fish in the same unit of land and water use, but that they also allow for the conservation of the traditional and/or indigenous cultural and artistic heritage. The system increases employment, especially for rural women, thus contributing to poverty reduction and gender equality, and it also enriches food supply, protects biodiversity and provides good nutrition. In China, the rice-fish farming system has already been recognized as a GIAHS by FAO, and it has great potential for scaling up worldwide, particularly in the mountain-terraced and low-lying land areas. Eco-tourism and branding products can also be developed.

³ Mu is a Chinese unit of area. 1 mu = 666.66 m²

40. However, small-scale farmers also face constraints when transiting from a conventional agriculture/aquaculture to integrated rice-fish farming. The most vulnerable farmers may be excluded from this process due to lack of access to suitable land, poor water supply, lack of capital or restrictive social and gender norms. The local constraints of poor, vulnerable and marginalized people need to be better understood and rice farming systems should be developed in a more inclusive and gender-sensitive way for more people to be actively involved and empower themselves.

41. For the rice-fish farming system to get up-scaled and deliver its benefits, several recommendations were formulated. First, it is crucial to conduct gender analysis and social impact assessment in order to get an in-depth and holistic understanding of the forecasted benefits but also of the risks associated with the innovation. For this, guidelines on how to conduct a social impact assessment in the context of rice-fish farming should be developed, as well as gender mainstreaming guidelines. Second, the collaboration between the different stakeholders from government, academia, non-governmental organizations, private entities and farmers should be encouraged. Third, exchange programmes and collaborations between different countries should be strengthened, especially with those that have successful rice-fish farming experiences. FAO can play a key role in promoting such exchanges and collaborations.

42. Finally, the participants acknowledge that holding such events annually at SHOU would be an excellent way of keeping the momentum going.

REFERENCES

FAO. 2013. *FAO Policy on Gender Equality. Attaining Food Security Goals in Agriculture and Rural Development.* Food and Agriculture Organization of the United Nations, Rome, Italy.

FAO. 2015. *Running out of time. The reduction of women's burden in agricultural production.* Food and Agriculture Organization of the United Nations, Rome, Italy.

FAO. 2019a. Report of the FAO Regional Training Workshop on Innovative Integrated Agro-Aquaculture for Blue Growth in Asia- Pacific. Kunming, China, 12–17 June 2017. FAO Fisheries and Aquaculture Report. No. 1292. Rome.

FAO. 2019b. Report of the Special Session on Advancing Integrated Agriculture Aquaculture through Agroecology, Montpellier, France, 25 August 2018. FAO Fisheries and Aquaculture Report No. 1286. Rome.

Halwart, M., & Modadugu V.G. 2004 eds. *Culture of fish in rice fields.*

APPENDIX 1 - List of participants (alphabetical order)

Name	Gender	Nationality	Organization	Job Title
Oluwafemi Ajayi	M	Nigeria	Food and Agriculture Organization	Consultant
Michael J. Akester	M	United Kingdom	WorldFish Myanmar (Yangon Region)	WorldFish Country Director, Myanmar
Huang Bo	M	China	International Exchange Service Center of Ministry of Agriculture	Research Assistant
Ning Bo	M	China	Archives, Shanghai Ocean University	Curator, Associate Research Fellow
Lionel Dabbadie	M	France	Cirad, Station Expérimentale d'Aquaculture, Ifremer, France	Researcher
Zhang Dingyun	M	China	General Office, the People's Government of Qingtian County	Director
Liu Dong	M	China	College of Fisheries and Life Science, Shanghai Ocean University	Professor
Wang Dong	M	China	International Exchange Service Center of Ministry of Agriculture	Project officer
Kong Fanhong	M	China	College of Marine Culture and Law, Shanghai Ocean University	Vice Dean, Professor
Yin Fu	F	China	Food and Agriculture Organization	Intern
Chen Haimin	M	China	The People's Government of Qingtian County	Vice Chief Executive, County Government
Matthias Halwart	M	Germany	Food and Agriculture Organization	Head of Aquaculture Branch
Tan Hongxin	M	China	College of Fisheries and Life Science, Shanghai Ocean University	Dean, Professor

APPENDIX 1 - List of participants (alphabetical order)

Name	Gender	Nationality	Organization	Job Title
Zhu Hua	M	China	School of Foreign Languages, Shanghai Ocean University	Professor
Li Jiale	M	China	Shanghai Ocean University	Vice President, Professor
Zhu Jiangfeng	M	China	Office of Science and Technology, Shanghai Ocean University	Vice Division Chief, Vice Professor
Zhou Jiawei	M	China	The People's Government of Qingtian County	Secretary
Li Jiayao	M	China	College of Fisheries and Life Science, Shanghai Ocean University	Lecturer
Luo Jun	M	China	The Agricultural Bureau of Congjiang county, Guizhou Province	Assistant Fisheries Engineer
Masayuki Kurechi	M	Japan	RAMSAR Network Japan	Joint Representative
Lou Lan	F	China	College of Marine Culture and Law, Shanghai Ocean University	Associate Professor
Delphine Lethimonnier	F	France	APDRA Pisciculture Paysanne, Paris and Area, France	Operations Manager
Zhao Lin	F	China	College of Marine Culture and Law, Shanghai Ocean University	Associate Professor
Wu Minfang	M	China	Qingtian County Crop Management Station	Stationmaster
Roxane Misk	F	Belgium, Lebanon	Food and Agriculture Organization	Intern
Ronnie S. Natawidjaja	M	Indonesia	Center for Sustainable Food Studies Padjadjaran University, Bandung dan Sekitarnya, Jawa Barat, Indonesia	Director
Francis Akatsa Okalo	M	Kenya	Research Partners Africa, Mombasa-Kenya	Researcher
Themal Paris	F	Philippines	International Rice Research Institute	Retired Social Scientist- Gender Specialist

APPENDIX 1 - List of participants (alphabetical order)

Name	Gender	Nationality	Organization	Job Title
Liu Qigen	M	China	College of Fisheries and Life Science, Shanghai Ocean University	Professor
Shen Qinghui	F	China	College of Marine Culture and Law, Shanghai Ocean University	Associate Professor
Min Qingwen	M	China	Chinese Academy of Sciences	Researcher
Li Shumin	M	China	Fisheries bureau of the Ministry of agriculture	Vice Director
Enok Sumarsih	F	Indonesia	Faculty of Agriculture, Siliwangi University, Tasikmalaya, West Java, Indonesia	Student
Vannaphar Tammajedy	M	Lao PDR	Namsouang Fisheries Development Center, Department of Livestock and Fisheries, Ministry of Agriculture and Forestry (MAF), Vientiane, Laos	Deputy Director
Phan Thi Thu	F	Viet Nam	Division of Fisheries Economics and Environment Southern Sub-Institute of Fisheries Economics and Planning	Head
Cherdsak Virapat	M	Thailand	Network of Aquaculture Centres in Asia-Pacific	Director General
John Walakira	M	Uganda	National Agricultural Research Organization, Kampala, Uganda	Senior research scientist
Zhang Wen	F	China	College of Marine Culture and Law, Shanghai Ocean University	Associate Professor
Yao Xiaoyue	F	China	Qingtian County Agriculture Bureau	Director
Chen Xin	F	China	Zhejiang University	Professor
Wang Xuhai	M	China	Qingtian County Agriculture Bureau	Vice Director
Liu Ya	F	China	Fisheries Institute of the Research Institute of Sichuan Academy of Agricultural Sciences	Research Assistant
Wen Ya	F	China	College of Marine Culture and Law, Shanghai Ocean University	Lecturer

APPENDIX 1 - List of participants (alphabetical order)

Name	Gender	Nationality	Organization	Job Title
Xiao Yanni	F	China	Yunan Zhonghai Fisheries Co., Ltd.	General Manager
Tang Yi	M	China	College of Marine Culture and Law, Shanghai Ocean University	Dean, Professor
Cheng Yongxu	M	China	College of Fisheries and Life Science, Shanghai Ocean University	Professor
Ando Yoshino	F	Japan	RAMSAR Network Japan	Joint Representative
Xinhua Yuan	M	China	Food and Agriculture Organization	Senior Aquaculture Officer
Yu Yuan	M	China	College of Marine Culture and Law, Shanghai Ocean University	Clerk of the Court, Associate Research Fellow
Zhu Zhanghua	F	China	Office of International Exchange, Shanghai Ocean University	Vice Division Chief, Associate Professor
Yang Zhengyong	M	China	Office of Science and Technology, Shanghai Ocean University	Division Chief, Professor
Bai Zhiyi	M	China	College of Fisheries and Life Science, Shanghai Ocean University	Professor

APPENDIX 2 – Workshop Agenda

Workshop Agenda		
Day 1: 4 December 2018		
Arrival, Check-in at the Howard Johnson Plaza Lingang Shanghai,		
Day 2: 5 December 2018		
08.00–08.30	Participants registration	
Welcome Introductions Chair: Mr Yang Zhengyong, Director of Division of Science and Technology of SHOU		
08.30–09.00	Opening Remarks	Mr Li Jiale, Vice president, SHOU Mr Halwart Matthias, Head, Aquaculture branch, FAO Mr Cherdasak Virapat, Director General of NACA Mr Li Shumin, Deputy Director General of BOF, MARA
09.00–09.10	Signing ceremony: cooperation between SHOU and the government of Qingtian county, Zhejiang province	
09.10–09.30	<i>Group Photo + Tea Break</i>	
Keynote Speeches Chair: Mr Yang Zhengyong, Director of Division of Science and Technology of SHOU		
09.30–10.00	Progress of GIAHS programme and cases of aquaculture culture heritage (video)	Mr Endo, Yoshihide, Coordinator of GIAHS, FAO
10.00–10.30	Chinese GIAHS sites and promotion programme	Mr Min Qingwen, Chinese Academy of Sciences
10.30–11.30	Global innovative agro-aquaculture system and its social contribution	Mr Halwart Matthias, Head Aquaculture branch, FAO
11.30–12.00	Nutrition-sensitive fish – rice food systems	Mr Michael Akester, Country Director Myanmar, WorldFish Center
12.00–12.30	Question and Answers	
12.30–13.30	<i>Lunch</i>	
13.30–14.00	Side event: flash presentation of young scientists	
Session 1: Social dimensions of rice-fish farming in Uganda, Indonesia, Madagascar and Vietnam Chair: Mr Xinhua Yuan, Senior aquaculture officer, FAO		
14.00–14.20	Poverty reduction by adoption of rice fish farming in Uganda	Mr John Walakira, Senior research scientist, National Agricultural Research Organization, Kampala, Uganda
14.20–14.40	Rice fish farming system (RFFS) contribution to the income and food security of farm households	Mr Ronnie S. Natawidjaja, Director at the Center for Sustainable Food Studies Padjadjaran University, Bandung dan Sekitarnya, Jawa Barat, Indonesia
14.40–15.00	Social impact of rice fish farming in Madagascar	Mr Lionel Dabbadie, Cirad, Station Expérimentale d'Aquaculture, Ifremer, Route de Maguelone, Palavas-Les-Flots (France)
15.00–15.20	Rice fish farming observation in Mekong River	Ms Thelma Paris, Retired Social Scientist-Gender Specialist of the International Rice Research Institute, Philippines.
15.20–15.40	Question and Answers	
15.40–16.00	<i>Tea Break</i>	
Session 2: Rice-fish farming in Lao PDR, Kenya, Madagascar and China Chair: Mr Tang Yi, Dean of College of Marine Culture and Law, SHOU		

APPENDIX 2 – Workshop Agenda

Workshop Agenda		
16.00–16.20	Social impact of rice fish farming in Laos	Mr Vannaphar Tammajedy, Deputy Director, Namsouang Fisheries Development Center, Department of Livestock and Fisheries, Ministry of Agriculture and Forestry (MAF), Vientiane, Laos
16.20–16.40	Integrated rice-fish production in Kenya: opportunities and future perspectives	Mr Francis Akatsa Okalo, Research Partners Africa, Mombasa-Kenya
16.40–17.00	Rice-fish farming observation in West Africa	Ms Delphine Lethimonnier, Operations Manager at APDRA Pisciculture Paysanne, Paris and Area, France
17.00–17.20	Integrated rice-fishing systems and work with indigenous and local communities in Yunnan Province	Ms Xiao Yanni, GM, Zhonghai fishery, Yunnan Province, China
17.20–17.40	Question and Answers	
18.00–19.30	<i>Dinner</i>	
Day 3, 6 December 2018		
Session 3: Ecological and economic dimensions of rice-fish farming in China and Vietnam		
Chair: Dr. Michael J. Akester, Country Director Myanmar, WorldFish Center		
08.30–08.50	Ecological story from rice-fish system	Mr Chen Xin, professor of Zhejiang University
08.50–09.10	The effectiveness of the shrimp - rice cultivation models in Mekong delta	Ms Phan Thi Thu, Head Division of Fisheries Economics and Environment Southern Sub-Institute of Fisheries Economics and Planning (SIFEP), Ho Chi Minh City, Viet Nam
09.10–09.30	The contribution of rice-fishing farming in new countryside construction of Sichuan province	Mr Liu Ya, Assistant researcher of Fisheries Institute of Sichuan Academy of Agriculture Sciences
09.30–09.50	Question and Answers	
09.50–10.10	<i>Tea Break</i>	
Session 4: Social and ecological dimensions of rice-fish farming		
Chair: Prof. Tan Hongxin, Dean of College of Life Science and Aquaculture, SHOU		
10.10–10.30	Rapid development of integrated rice-fish, rice-mitten crab and rice-crayfish farming in China	Mr Cheng Yongxu, professor of Shanghai Ocean University
10.30–10.50	Social impact of RAMSAR sites	Mr Masayuki Kurechi, RAMSAR Network Japan
10.50–11.10	Ecological wisdom of rice-fish-duck integration in Dong village, Congjiang, Guizhou	Mr Luo Jun, assistant fisheries engineer of Bureau of Agriculture in Congjiang, Guizhou province
11.10–11.30	Question and Answers	
11.30–12.00	Summary and Closing	
12.00–13.00	<i>Lunch</i>	
Afternoon	Trip to site of field study, Qingtian, Zhengjiang Province	
Day 4, 7 December 2018		
Morning	Field study and on-site learning in Qingtian, Zhengjiang Province	
Afternoon	Trip back to Shanghai	
Day 5, 8 December 2018		
Departure		

APPENDIX 3 – Side Event Agenda

1. Opening introduction for the event

2. Introductions to various topics regarding social impact was be given by the following presenters:

Name	University/college	Topic
Ms Enok Sumarsih	PhD, Faculty of Agriculture, Siliwangi University, Tasikmalaya. West Java Indonesia	Rice fish farming system contribution to the income and food security of farm households
Ms Roxane Misk	MSc, LUISS Guido Carli University of Rome, Italy MSc, Free University of Brussels, Belgium	Gender dimensions of rice fish farming
Ms Yin Fu	MSc, University College of London, UK	Nutrition and public health concern in rice fish farming
Mr Oluwafemi Ajayi	MSc University of Hohenheim, Germany	Nutrition research framework in rice fish farming
Mr Zongli Zhang	PhD, College of economic and management, Nanjing Agricultural University	Food-Away-From-Home Plate Waste in China: Preference for Variety and Quantity
Ms Wenjing Hu	MSc, College of Fisheries and Life Science, Shanghai Ocean University	Conservation and Management of original species in Rice Fish Farming System, HU, Wenjing, College of Fisheries and Life Sciences
Mr Jinghao Li	MSc, College of Fisheries and Life Science, Shanghai Ocean University	A study of juvenile <i>Procambarus clarkii</i> farmed using biofloc technology
Mr Idrissa Diedhiou	PhD, College of Economics and Management, Shanghai Ocean University	Presentation title: Socio-economic dimension of the octopus (<i>Octopus vulgaris</i>) in the context of fisheries management of the small-scale fisheries and industrial fisheries in Senegal
Ms Zhiyi Zhang	PhD, College of Economics and Management, Shanghai Ocean University	Seabass Pond Aquaculture status in Guangdong, China.

3. Question and Answer section

4. Summary (Mr Idrissa Diedhiou)

APPENDIX 4 – Photographs



Mr Li Shumin, DDG, BoF, Mr Li Jiale, vice president of SHOU, presenting at opening session



Group picture of main participants



Group picture at the signature ceremony



Experts actively joined the discussion session



Field visit at Longxian Village, Qingtian, in front of a stone carving of the famous Qingtian carp



The natural beauty of Qingtian



©Ms.Roxanne Misk

FAO experts listening to an introduction of GIAHS Rice-Fish Co-Existence Museum at Qingtian



©SHOU

Group picture at GIAHS Rice-Fish Co-Existence Museum



©SHOU

Group picture with the students who performed Qingtian Fish Lantern Dance

This document summarizes the preparation, process and conclusions of workshop “International Promotion Programme on Social Impact of Rice-Fish Farming, which was organized by the Food and Agriculture Organization of the United Nations (FAO) and the Shanghai Ocean University (SHOU) from 4 to 8 December 2018 in Shanghai, China.

Integrated rice-fish farming is a globally important practice and has been documented around the world. These farming systems produce two products from a single plot of land, and therefore increases the overall productivity, and income, from the same volume of water. It is especially important among small-scale farmers, and has been shown to improve the productivity, economic return and gender equality in rural areas. Although an ancient practice in some locations, innovation and adoption in new areas has continued. Today, it is considered an agroecological approach, generating both economic and social benefits for local communities by supporting essential ecological functions and providing multiple goods and services. Recognizing its unique status and importance, certain rice-fish systems have been designated as Globally Important Agricultural Heritage Systems (GIAHS), recognizing both their cultural and agricultural importance.

ISBN 978-92-5-132986-3 ISSN 2070-6987



9 789251 329863

CA9907EN/1/07.20