



Farmer Field Day: 4 October 2019

Tarpatt West village, Maubin Township, Rice-Fish experiment and Demonstration site

Dr. Nilar Shien (DoF Yangon) and Mike Akester WorldFish Country Director, Myanmar



Fig. 1. Daw Kyi Kyi Than, farmer Maubin demonstration site, addresses the Regional Minister U Tin Aung Win

Background

With ACIAR funding CGIAR partners WorldFish and IRRI along with three Ministry of Agriculture Livestock and Irrigation Departments (Fisheries, Agriculture and Agriculture Research) have been researching into the viability of rice-fish integrated farming systems in the Ayeyarwady Delta. This work started with a small-scale experiment which concluded with good results in 2017. The current large-scale research project started 23 June 2017 and will run for 4.5 years with a completion date 31 December 2021. The project has three main objectives:

1. To characterise rice-fish systems in the Ayeyarwady delta
2. To identify improvements in rice-fish production and management systems that optimise gender-equitable income, food and nutritional outcomes and
3. To strengthen the capacity and enabling environment for research, dissemination and uptake of improvements in rice-fish systems

To date the research has shown that the use of Best Management Practices for Rice, Fish and Water, with a fish refuge area less than 15% of the rice plot area, can maintain the rice yield over the rice-fish area (with higher rice yields than neighboring farmers) while doubling the profitability of the integrated farming unit due to the introduction of fish. In addition considerable benefits are delivered in terms of improved human nutrition and environmental protection due to the reduction in pesticide use and return of aquatic animals as a food source.

While work continues under objective two to optimize gender equitable incomes the project has started to work on output three with capacity development and a series of land use policy initiatives to allow the rice-



fish integrated diversified cropping system to be promoted at scale. This process involves work at both National and sub-National levels. Hence the first Farmer Field Day on 4 October 2019 at one of three demonstration sites in the Delta to disseminate the results to date and seek clarifications regarding our land use policy work form the Regional Minister U Tin Aung Win.

U Tin Aung Win

Ayeyarwady Regional minister for agriculture, livestock, natural resources and environmental conservation. U Tin Aung Win is a retired department director with the national Ministry of Agriculture and Irrigation, he was appointed in January 2018.

U Tin Aung Win joined the demonstration day with his Departmental Directors from Fisheries, Agriculture, Rural Development, Irrigation, Land-Use Management along with representatives from Naypyitaw central government and Yezin Agricultural University.

The Demonstration Day started with the Minister and his colleagues taking a tour of the rice-fish demonstration and research site along with around 100 farmers from the Maubin Township.

After the visit, which included detailed explanations of the system by the Township officers and the host farmers: U Aung Kyaw and his wife Daw Kyi Kyi Than, the Minister made the following comments:

1. To date the Agriculture sector in the Delta has not developed as much as expected.
2. ACIAR Rice-Fish projects started since 2016.
3. There is a need to confirm that R-F systems are as profitable as the research indicates as farmers are interested in adopting the integrated farming approach
4. He advised that paddy variants with a longer growth period (105 days compared with 90) might be more suitable with rice-fish culture (longer fish growth period) and two rice production seasons are better for this system. He noted the need for sufficient water throughout both production seasons and that flood prone areas should be avoided.
5. Rice, Fish & duck integrated farming can protect from golden snails – a pest introduced some time ago.
6. He is looking for clear evidence in order to urge interested farmers to confidently adopt rice-fish culture.
7. He stated that he wants to scale-out the results of the project and encourage his staff to promote this.
8. He emphasized that the 10-15% usage of paddy land for other agricultural food producing purposes requires no additional permission as the Land use Department will now allow this integrated farming system.
9. The percentage area modified (paddy to water surface area) should not exceed 15% and Land use Law principles need to be followed ideally with a simple agreement with the local authorities.
10. Follow the example from U Aung Kyaw's experience: the rice-fish concept should extend to the other adjacent farmers gradually.

Mike Akester, WorldFish Country Director and R-F coordinator

- ✓ Thanked U Tin Aung Win (Regional Minister) and his Regional Government, District and Township officials, the Demonstration farmers, U Aung Kyaw and Daw Kyi Kyi Than, and the donor's research



coordinator from ACIAR, U Myo Thura. He also thanked all the other farmers for their active participation.

- ✓ According to Minister's message, he was glad to hear that there is no need to apply for permission to convert 10-15% of paddy land area to water for the inclusion of fish as a diversified cropping system.
- ✓ Fish along with rice and vegetables produced under the integrated systems provide improved nutrition and a range of micronutrients important during children's development and for adult good health.
- ✓ Integrated fish agriculture food systems can increase the provision of nutrients for the farmer families and those purchasing the products in the locality.
- ✓ Small Indigenous Fish Species (SIS) will return to the R-F systems once pesticide use is reduced. This further improves the availability of micronutrients while protecting biodiversity in general.

Alex Stewart, IRRI R-F Project coordinator

- ✓ As part of an ACIAR project called MyRice, IRRI, Worldfish, DOF, DOA and DAR began a pilot research study on rice-fish in this farm with U Aung Kyaw and Daw Kyi Kyi Than 3 years ago. The main aim was to test the feasibility and economic performance of rice-fish culture in the Ayeyawady region.
- ✓ 2 years ago, ACIAR then funded the current project and we added research on how to optimize management practices for rice fish culture in the region. e.g. what is the optimum amount of fertilizer required, how to plant rice and how to manage water, weeds and pests.
- ✓ Through this research, we have learnt several lessons that can be helpful.
- ✓ The first key lesson is that when growing rice in rice-fish systems, the best management practices (BMPs) for rice should also be used.
- ✓ This includes transplanting or sowing rice in rows, local recommended fertilizer rates and timing and minimal use of pesticides.
- ✓ The 2nd key lesson, is when using BMPs, the rice production in rice-fish can be maintained – even though 13% less land was planted with rice.
- ✓ In fact, the last 2 summer seasons, the rice production in our rice fish plots with BMP was higher than the neighbouring farmers that we monitored, even though we used no pesticides and less fertilizer
- ✓ Last season, the total harvest per acre for rice-fish with BMP was 143 baskets/acre (100/area usual).
- ✓ The 3rd key lesson is rice-fish can double profitability. When we compared the economic performance of rice-fish with neighbouring farmers, the net income was similar in the first season. However, in the last summer season, due to good rice and fish harvests and less inputs for rice, the net income for rice-fish with BMP was double that of the neighbouring rice farmers.
- ✓ In summary, as long as no more than 15% of the rice growing area is used for a fish refuge, our results show that integrating rice and fish culture can produce the same amount of rice per acre as a rice monoculture
- ✓ In addition, the fish provide additional benefits such as increased income, they provide an alternative source of income in case of a bad rice harvest, they help to reduce pests, weeds and diseases and they provide more nutritious food for your community.



U Aung Kyaw (Farmer)

- ✓ He has been collaborating with rice research activities with IRRI since 2015 and subsequently with WorldFish and IRRI on rice-fish systems since 2016
- ✓ He has profit from this rice-fish system using < 15% fish refuge area and wants to do continue with this activity with an endorsement document from the related MoALI department
- ✓ According to his experience he has not used pesticides and this is better for paddy and human health
- ✓ If these rice-fish production systems are endorsed by the Minister the integrated systems will be sustainable

Daw Kyi Kyi Than (Farmer's wife)

- ✓ She is involved in feeding the fish daily and observing their growth
- ✓ At fish harvest time she markets the fish and keeps some for family consumption: fresh or by drying and fish paste preservation
- ✓ By using the rice fish production system the family can get extra income and eat more. As a family they now eat more fish curries which is good for their children.

DoA Regional Officer, Pathein

- ✓ ACIAR Rice Fish Project started since 2016 & obtained profits for farmers according to results
- ✓ He wants to urge farmers to conduct integrated rice fish production by discussing with local related Departments

Questions and answers

Farmer # 1

Who should I contact to start a rice-fish farming system on my land?

DoA District

The first step is to contact the DoA and they will provide rice seed information and registration for those willing to adopt rice-fish systems

DoF District

Will provide assistance with the fish refuge area preparation, fish culture technics and fish seed for the first stocking

Minister

The relevant Government Departments will be helping the farmers, for suitable site selection, profitability, percentages of water, system design, rice varieties, fish species (and stocking to begin), initially at a smaller scale, then when the farmers want to extend they have to go on their own.

Farmer # 2

Will it be possible to dig fish refuge areas along all 4 boundaries of the rice field?

DoA District

Best to be used like an 'L' shaped fish refuge area – only two sides, not all four.



Farmer # 2 The 'L' - shape type or one side used as a fish refuge pond might be difficult for dike rising as not enough soil available. There is a need to raise dikes around the rice field to protect fish during the monsoon

Minister If the water area doesn't extend 15% of paddy land, any type of rice fish system can be used while discussing with MoALI Departments

Conclusion

The land-use policy reform process, which started on 8 August 2018 with the Naypyitaw agreement to allow integrated agriculture for rice-fish production, has now been taken a step further with the agreement, in the Ayeyarwady Region, that up to 15% of a farmer's rice-field area can be converted into fish holding refuges for integrated rice-fish production systems.



Fig. 2. Front row from left: Dr. Nilar Shein (DoF – WorldFish), Daw Kyi Kyi Than (farmer); U Aung Kyaw (farmer); Regional Minister U Tin Aung Win; Regional DoA; Township DoA and DAR Daw Hmwe Hmwe, Director of Rice Division, DAR.



Fig.3. Rice fish demo with 'L' shaped fish refuge areas amounting to 15% of the plot size



Fig. 4. Rohu and silver barb – have doubled their size during first month of growth



Fig. 5. Question and answer session with the Minister U Tin Aunyg Win



Fig. 6. U Than Aye talking to the Regional Minister U Tin Aung Win about the Naypyitaw agreement as endorsed by the Union Minister



Fig. 7. The Department of Land Use Management and Statistics local representative officer at right



Fig. 8. Participating farmers interested in rice-fish farming



Fig. 9. Participating farmers with questions about how to adopt rice-fish farming



Fig. 10 Daw Kyi Kyi Than and U Aung Kyaw's home and fish-cum-duck pond



Fig. 11. Daw Kyi Kyi Than and U Aung Kyaw's family



Fig. 12. The experimental set-up at the Maubin site



Appendix 1

Farmers showing their interest in the adoption of rice-fish production systems

1. U Saw Kanay De – TarPat village tract
2. U Thein Win – TarPat village tract
3. Daw Win Myint Thein – TarPat village tract
4. U Win Hlaing - TarPat village tract
5. U Soe Min – Inn Ma village tract
6. U Htay – Inn Ma village tract
7. U Htay Lwin – A Chan village tract
8. U Khin Win – A Chan village tract
9. U Saw Kae Hmuu – A Chan village tract



Farmers showing their interest in the adoption of rice-fish production systems



Participant list

| Participants | F | M | Grand Total |
|---------------------------|-----------|-----------|-------------|
| Farmer | 8 | 49 | 57 |
| DoA | 9 | 23 | 32 |
| DoF | 3 | 3 | 6 |
| DALMS | | 1 | 1 |
| DAR | 1 | | 1 |
| Farm Mechanization | | 1 | 1 |
| IRRI | 2 | 4 | 6 |
| WF | | 3 | 3 |
| Minister | | 1 | 1 |
| GAD | | 3 | 3 |
| Parliament representative | | 1 | 1 |
| Grand Total | 23 | 89 | 112 |