



Year One Annual Report

[Contract/Agreement] Number: AID- 482 – A – 14 – 00003

Activity Start Date and End Date: September 21, 2014 to September 20, 2017

Total Award Amount: \$ 1,728,871.00

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30 October 2015

Khun Thein Soe
USAID
Yangon

Re: Fourth Quarter Report (July - September 2015): Developing A Sustainable Seafood Industry For Burma AID-482-A-14-00003.

A. Details of current progress achieved towards objectives, keyed to project indicators

Specific progress toward objectives:

A. Collaborate with YU and PU to develop industry leadership with educational and extension expertise

Our relations with both Universities have been excellent. Senior administrators have been most helpful and supportive. Our recommendations and efforts to introduce industry members and build relationships between academics and industry have been met with great acceptance from both sides. Internship program has been well received and we have been able to place students as quickly as we can provide them with some specialized training on what the jobs entail, what to expect as part of their duties, and some guidance on what it means to be an intern and in a paid position. Most of the students have never held a paying job and have not been in the private sector.



The faculty of both YU and PU have been fully engaged with the program and have made a point to participate fully with the various workshops and training opportunities we have offered. We are well ahead of our metric for providing training for faculty. We are also working on a translation of a large aquaculture handbook into Burmese. Although not a listed deliverable in our original proposal, we think this will be a valuable contribution that we are putting together in addition to the other listed objectives.

B. Develop a core of University faculty and extension specialists with skills and knowledge to assist fishers, farmers, feed mills, and processors

3.2.2-36 Number of USG-supported tertiary programs with curricula revised with private and/or public sector employers' input or on the basis of market research (2)

Auburn University and University of Arizona faculty met repeatedly with Yangon University faculty to discuss both seafood safety and aquaculture, but also discussed course work and pedagogy of English instruction and role of women in the University environment as faculty and professional staff teaching.

The actual revisions in curricula must be approved by Ministry of Education at this time. However, there are discussions underway to devolve decisions on curriculum changes back to the Universities themselves. So the faculty are preparing the recommendations to forward to the Ministry of Education or should the devolution take place.

Following our June meetings with faculty and administration at Pathein University, we have continued

the discussion on curricular changes by email and with additional meetings with our Burmese project staff. Pathein University has also instituted aquaculture production training with the support of our project and the students are now able to graduate with an aquaculture diploma.

With the partial transfer of Dr. Kay Lwin Tun to Sittwe University she has also begun discussions with the faculty and administration at Sittwe to revise their curriculum to match some of the revisions currently underway at Yangon University.

In July we met with the Rector of Mandalay University along with several of his senior administrators and faculty in Zoology. He was very pleased to learn of the details of our project and the opportunities for collaboration. As he was preparing to step down as Rector he described his desire to see some kind of collaboration occur in short order to establish a firm connection in place so his replacement could further develop upon a good base. We spent the next couple of hours with the zoology faculty touring their facilities discussing their curriculum and exploring mutual goals. It turned out that they had an opportunity to send several students to a certificate course in hatchery technologies but lacked the financial support. We agreed to provide the funds to the University to enable the students to participate in the training program and earn their certificates (See details below in 3.2.2 -37). Appendix 6.

3.2.2-37 Number of US-supported tertiary educational programs that develop or implement industry-recognized skills certification (1 completed and 1 in progress)

In August, the project provided financial support for students from Mandalay University to attend a certification course in hatchery techniques where they earned certificates issued by the Department of Fisheries.

On a longer term basis, Dr. Kay Lwin is developing a certificate course that will cover the industry recognized skills that she and Dr. Jean McLain are teaching in qPCR and other molecular techniques for monitoring seafood safety.

3.2.2-41 Number of individuals from underserved and/or disadvantaged groups accessing tertiary education programs. (15 scholarships, and 13 internships)



We have been able to provide a number of scholarships for students for portions of this year and additional scholarships in the next academic year. The eight students receiving scholarships for all of next year at Yangon University, were featured in a ceremony on the Yangon campus. The Rector presented the scholarships while a significant number of administrators, faculty and students as well as representatives from USAID were able to attend. Of the eight students receiving scholarships, one was from Rakine and one was from Karen State. See Appendix 2.

We have also provided funds so that Pathein University has provided 50 scholarships for the current academic year. Eleven of these were to students from Rakine state and are believed to be from underserved and/or disadvantaged groups. The project also providing funds for 26 students from Mandalay University to attend a certificate training course in hatchery techniques. One of these students was from Kachin State, and another from Magway, both underserved and/or disadvantaged regions.

The project has also funded 16 internships in year one. This is below our target, but we are proud that eight of the interns are from Rakine State, three from Mon State and two from Magwe State.

3.2.2-42 Number of tertiary institution faculty or teaching staff whose qualifications are strengthened through USG-supported tertiary education programs (211)

The bulk of the training was accomplished at Yangon and Patheingyi University with multiple trainings during the year starting in January and continuing in March, April and June and July. The most intense period was when we brought four additional professors for specialized training in late June 2015. During this one week alone we were able to strengthen the qualifications of 176 faculty members mostly from Yangon and Patheingyi Universities. However, we were able to invite faculty from several universities as the government has a program to cover expenses of faculty to come to Yangon for special training. Our program met the criteria so faculty from Myiik, Mandalay, Sittwe, Dawei, Malayaing Universities, West YU, East YU, and Dagon University also attended.

See Table 1. and Appendix 1.

Table 1. Seafood Safety and Seafood English Training

Date	University	Occupation	Gender		Remarks
			Male	Female	
22 nd June, 2015	Yangon	Faculty	5	50	
		Student	10	40	
23 rd June, 2015	Yangon	Faculty	6	80	
		Student	15	41	
26 th June, 2015	Patheingyi	Faculty	13	22	
		Student	58	30	

STIR-6 Number of scientific studies published or conference presentations given as a result of USG assistance for research programs. (3)

At the World Aquaculture conference Fitzsimmons, Kay Lwin and May Myat Noe Lwin each provided presentations on various aspects of the project.

C. Collaborate with the Burmese private sector to provide technical training to feed mills, boat owners, processors and other industry vendors

In July, the team made a large number of virtually daily contacts with industry members to discuss the project, consider collaborations and explore opportunities for internships and academic-industry engagement. Several of the below contacts invited us to prepare statements of work for internships. Some of these are still pending and the team will need to follow up and through with the opportunities.

Industry connections:

- July 1 Dr. Nyan Taw – Blue Archipelago and FAO consultant
- July 1 Thu Ta – Managing Director – Better Day Media (Food Magazine)
- July 2 Ziv Ragowsky – Director Myanma awba group - agribusiness
- July 3 Johan van den Ban – Managing Director – De Heus Myanmar – feed mill
- July 3 Kosol T. – Chef- Chatrium Hotel
- July 6 Steve Dowall – Lead Tech Officer LIFT
- July 7 Htin Lin – Director – BioMed Myanmar
- July 7 Myo Nanda Kyaw – Sales manager – BioMed Myanmar
- July 11 Dr. Maung Thynn – Rector – Mandalay University
- July 11 Dr Mee Mee Tun, Department Head Zoology – Mandalay University
- July 11 U Myat Htut - Managing Director - San Pya Livestock Co. feed mill
- July 11 Dr. Nay Thu Yein – Director – Mandalay Livestock Co. fish farm
- July 11 Dr. Kyaw Htin – Managing Director Chicken King poultry and fish farmer / processor
- July 14 DoF facility north of Inle Lake

July 14 Mr. Hla Kyaw Owner, Private fish farmer, Naung Shwe, north of Inle Lake
 July 14 Ms. Khin Khin Htwe, general manager of father's fish farms (above)
 July 16 Maw Maw Than – Deputy Director DoF Aquatic Animal Health and Disease Control Section
 July 16 Dr. Su Myo Thwe – Director – Fish Inspection and Quality Control
 July 17 Dr Thet Hmu – Chairman – Myanmar AquaFeed Association – feedmill
 July 17 U Win Latt – Vice President CP Prima, Largest shrimp farm in Indonesia
 July 17 Valerie Oo – KOSPA
 July 17 Dr Jesper Clausen – USSEC consultant on aquaculture development in SEAsia.

In virtually every case we had discussions regarding support for interns, industry support of the project, and supply of fry, fingerlings, or post larvae and experimental feeds for demonstration projects. Virtually all readily agreed to these requests. (Appendix 5)

We continued the project with Myo Aung in Okkan and the KMK Company for a demonstration project to grow a crop of Asian Seabass in the freshwater ponds of an inland location such as Okkan. The barramundi farming in fresh water project came to a most successful conclusion. In the first partial harvest, fish were netted from the Okkan farm on July 6 and fish were brought to the Chatrium Hotel for a test dinner. The chef was most impressed with the freshness and high quality of the barramundi. In fact, he declared the fish was such high quality, it would suffer from being cooked, and instead he prepared the fish as fresh sashimi style. All of the people invited



to the dinner gave the fish outstanding reviews. The press representatives all provided positive press reports (Food Magazine, farm press and popular press including newspaper and television) on the project and the quality of the fish. In early September the rest of the fish were harvested. The survival was 93% which is exceptional for any kind of aquaculture project, but especially remarkable for production of a marine fish transplanted to freshwater. The average weight of the fish was 775 grams.

We also took the opportunity to work with the KOSPA group to help with delivery of the fish to the market. They brought a truck to the farm and after quick chilling with ice water, the fish were put into the refrigerated storage in the truck. The chilled delivery truck helped to maintain quality until arrival at the buyer's facility. Unfortunately, due to the extensive flooding at that time, many other farmers pre-emptively harvested their ponds causing a temporary glut on the fish markets and depressing the prices that Myo Aung was able to get for the fish. However, even with the depressed prices, he was still able to show a profit.

We have heard that KMK has also had success with their project in Samulak which was trying to conduct a similar demonstration project. This is encouraging to have a replication of our results. Myo Aung has already purchased additional fingerlings and plans to restock the pond and try another crop.

D. Organize, with the US private sector; an eel farming demonstration project at Yangon University; work with soft-shell crab farmers to replant and restore mangrove habitat; set up a crab hatchery for stock enhancement; participate in an Aquaculture Dialogue with World Wildlife Fund to develop Best Management Practices for soft-shell crab farming; identify locations that might support a large-scale tilapia cage farming operation.

We understand from Haim Avioz of the Tiran Group that they are still making progress on their plan to import post larvae for an Israeli *Macrobrachium* hatchery and also tilapia fry for a fish hatchery. We were in contact with Ripple Fish in August to discuss their plan to export eels from Madagascar to Myanmar. Apparently they are having problems with exporting the eels at this time. A mix of government red tape and a farm operation delay. The Ripple Fish group reports that they are in contact with a Malaysian partner to start a grouper farm and asked if we could work with them on groupers. I replied that we could assist and recommended that we get in touch with the KMK Group as convert a few barramundi cages in Myeik

to grouper.

Regarding DuPont, we had several emails with Sittideth Sriprateth. Apparently their chief regional aquaculture expert, David Bal, took another position and a new person has only recently been hired. She is still getting training in the Dupont product lines and will plan to meet with our team in January. She was very interested to be able to work with an intern who may be able to also educate her on Burmese aquaculture.

With Regal Springs, they are interested in the cage culture opportunities but as a company have decided to focus on big new project in Brazil in short term. In longer term, they have just taken a big investment from an Asian partner who does want more Asian opportunities. We expect that Burma will be a prime potential location. However, we were not as pleased with the Thaphan Seik reservoir as we had hoped.



We have not made any direct plans with Handy Seafood as we are still developing plan for the crab hatchery and the on-farm sanitation project. As we ramp these up in year 2, we will renew the discussion with Handy.

Soe Tun made a presentation on mangrove friendly shrimp and crab farming in July. The presentation was to a mixed audience of NGO's, farmers, academics and ecologists. From several accounts the presentation was well received and garnered interest as a sustainable concept allowing production of shrimp in mangrove areas with minimal impact. In fact, many believe that the system would allow for controlled recovery of damaged mangrove habitat.

E. Conduct training and demonstration projects in the Myanmar provinces of Rakhine, Ayeyarwady, Yangon, and Tanintharyi

In the final quarter of year one, we held our most wide ranging trainings and farm visits. In the beginning of July we visited a couple of sites a day's drive north of Shwebo. First we visited Ye Myit Kyi, a small fishing town on an ox-bow lake. The main occupation of the town is the capture, salting and drying of small tilapia. These dried fish are sold locally and to the urban areas of Shwebo, Mandalay and even Yangon. We discussed one option they might have to increase production with cage farming of tilapia. Next we continued driving north to the Thaphan Seik reservoir, the largest in Burma, where we spoke with a local fisheries and aquaculture cooperative regarding their interest to develop a large cage farming project in the reservoir. This is also of interest to Regal Springs. We were a bit disappointed that large areas of the lake are relatively shallow and not appropriate for deep cage farming. However, there are some deep sections that could be appropriate.

F. Provide a special focus on the disadvantaged groups of fishers and farmers in the rural areas where most of the fishing and aquaculture occur

In July we met with farmers in Shwebo in Sagaing and near Taunggyi in Shan State. In August and September the team members made two trips to Sittwe to organize and conduct training for farmers and students in Rakhine. This fits with our efforts to provide a considerable presence in the more remote areas of the country and to not focus on the environs of just Yangon and Mandalay

G. Place a special emphasis on reaching women with training and outreach programs

GNDR-2 Percentage of female participants in USG-assisted programs designed to increase access to productive economic resources (assets, credit, income or employment).

We have been diligent to invite female faculty and students at all levels of participation. Workshops tend to have a majority of female faculty and female students. The scholarships we awarded were likewise dominated by female recipients. Appendices 1, 2 and 3.

Scholarships - 38 male and 46 female	55% female
Interns - 5 male and 11 female	69% female
Faculty training in workshops - 24 male and 152 female	86% female

Dr. Josephine Kochmaros has prepared an in-depth report with a series of recommendations which the project partners have been able to review. Some recommendations were able to be implemented by us, others have been shared with stakeholders and we are still determining how to determine who to monitor these results. Dr. Korchmaros has also published articles about the project in the department news blog, but also in a newsletter distributed to alumni and a large mailing list of stakeholders.

H. Train various stakeholders to further disseminate information about seafood's nutrient dense qualities and over-all beneficial impact on child and adult health

In the summer of 2015, we incorporated these aspects into the seafood business presentations and the seafood safety. With the repeated presentation and multiple audiences, we were able to share the information about the beneficial nutritional aspects for children and adult health. With more and more Western influence and fast food coming in, nutritional information is especially important for young adults.

I. Implement an on-farm sanitation demonstration program to install septic systems, toilets and hand wash sinks

3.1.8.2-2 Number of people gaining access to an improved sanitation facility (0)

3.1.8.2-3 Number of improved toilets provided in institutional settings (0)

We purchased two sets of septic rings and built two systems at the Aquatic Bioscience lab. One to receive wash water from the kitchen sink and the second to receive wash water from the lab sinks. The lab septic system was filled with layers of activated carbon, sand, and zeolite with the intent to capture any hazardous waste that might get washed down the sink. The YU campus is still getting organized for a hazardous waste disposal infrastructure. The other septic to receive the kitchen wash water was filled with layers of sand and gravel that would be more similar to the septic systems that we intend to install on farms. Several students participated so they will have some practical experience in septic system installation.

J. Purchase and install a fully functioning microbiology, food safety, and water quality lab at Yangon University

The repeated delays with the accumulation in the warehouse and delivery of the lab equipment and supplies has been a serious obstacle. We were finally able to get the lab cleaned, and basic lab benches and chairs delivered and plumbed and electrified. The lab benches especially have been a huge improvement. The arrival of the PCR machine was equally important to the success of the summer effort. Yangon University also made several physical improvements bringing some new furniture and lab flooring. They also upgraded the internet wifi connection. The vendor has now accumulated the rest of the equipment and supplies we purchased and crated and delivered to freight forwarder at seaport.

B. Problems addressed / deliverables completed to date;

The delays on importation of equipment (from all parties) has been a frustration. However, we have the first two successes of PCR and lab benches imported, through customs and installed now. The larger shipments of equipment and supplies are coming along, and should be put to sea if they are not already.

C. Management and personnel changes;

No changes to report

D. Problems encountered, if any and reasons why established goals were not met, if appropriate, and how challenges or problems will be overcome during the next reporting period;

Some areas where we are behind include the delivery of the equipment and supplies. I have addressed some by hand carrying several suitcases of supplies and books to Yangon and Patheingyi and with frequent communication with vendors and even preparing shipping documents for them trying to speed up process. We are also behind on internships. This is in part because of slow start from some of our international corporate partners. However, by end year we had a full complement of interns and several additional opportunities for interns in the new year. So we hope to catch up by mid-year.

E. A comparison of actual expenditures with budget estimates, including analysis and explanation of cost overruns or high unit costs, and any other pertinent information as may be applicable;

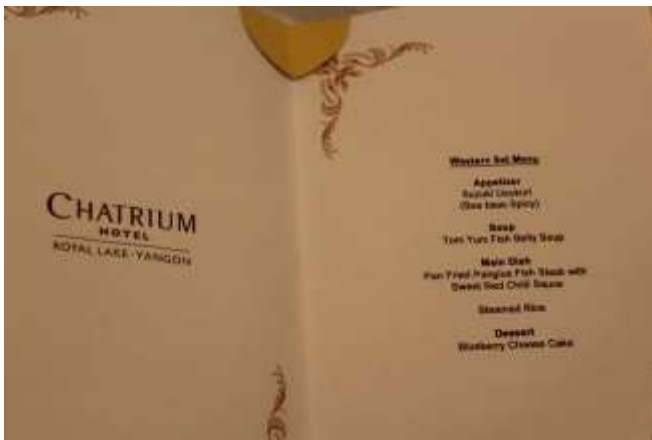
The project is close to budget but a little low in spending. However, we expect a large shipping bill for the materials coming by sea and a substantial air freight bill as well. With those bills and paying for the next round of scholarships and internships, we will be very close to budget.

F. Priorities for programming during the next reporting period;

Getting the lab at Yangon University fully function is a priority. Getting the full complement of interns in the field is another. Getting workshops more fully attended and on a more regular basis is another priority.

G. Success stories.

The growth, harvest and sale of barramundi (Asian Sea Bass) in the freshwater ponds of Okkan was a scientific and industry success. The survival rate was better than we had hoped and while the growth rates in the early period were slow, the rate increased considerably in the July-September period. We



attribute this do a combination of the better feed and better feed management, both part of the learning process for the farmer and the student interns who were stationed at the farm. The partial harvest we conducted in early July was a special success. The sample of fish we delivered to the Chatrium Hotel were acclaimed by the chef to be as good a quality as any fish he had purchased before for the hotel. The meal he prepared for the team and some press invited to learn about the project, was recognized by virtually everyone as one of the best seafood meals that they had ever eaten.

The final harvest demonstrated the high survival and fast growth that could be achieved in freshwater. Unfortunately, do to regional flooding, many other farmers had rushed to harvest their ponds before they could be flooded. The price the farmer received for the fish was higher than he could have received for tilapia, carp or *Pangasius*, but was somewhat depressed from what we had anticipated. Nevertheless, U Myo Aung was very pleased with results of the trial and he purchased additional fingerlings to restock the ponds after our trial was concluded.

Sincerely,

APPENDIX 1. Workshops at Yangon, Pathein and Sittwe Universities, and Twantay farming area January to September 2015.

Date	Title	Trainer	No of Attendance/trainees
8 January 2015	Introduction to Seafood Project for Burma	Dr. Kevin Fitzsimmons	<i>Did not prepare attendance list Estimate of 50 students and 10 faculty</i>
5 and 6 March 2015 (6 hours)	Aquaculture Teaching, Research and Extension at Auburn University	Dr. Bill Daniels	10 Students and 8 faculty members from YU
8 June 2015 (1 hour session we led)	Seafood Safety and Traceability	Dr. Kevin Fitzsimmons U Soe Tun May Myat Noe Lwin	70 industry stakeholders Nay Phi Taw
12 June 2015 (2 hours)	Pond Fertilization and Water Quality Management	Dr. Hugh Thomford	24 Students and 11 faculty members from YU
22 June to 2 July 2015 (12 hours)	Training on Seafood Safety and Quality Assurance and Seafood Business English	1. Dr. Kevin Fitzsimmons 2. Dr. Jeannie McLain 3. Dr. Linda Marie Chu 4. Dr. Julianne Hammink 5. Dr. Josephine Korchmaros	194 Students and 176 faculty members from YU, Myiek, Mandalay, Sittwe, Dawei, Malamaing Universities, West YU, East YU, Dagon, Pathein Universities
25 June 2015 (4 hours)	Training on Seafood Safety and Quality Assurance and Seafood Business English	1. Dr. Kevin Fitzsimmons 2. Dr. Jeannie McLain 3. Dr. Linda Marie Chu 4. Dr. Julianne Hammink 5. Dr. Josephine Korchmaros	60 farmers and farm managers Dept of Fisheries Myanmar Fisheries Federation
26 June 2015 (4 hours)	Aquaculture Best Management Practices and their application to Seafood Safety and Seafood Business English	1. Dr. Kevin Fitzsimmons 2. Dr. Linda Marie Chu 3. Dr. Julianne Hammink 4. Dr. Josephine Korchmaros	40 farmers and farm managers Twantay
16 July 2015 (4 hours)	PCR for disease diagnosis and Food Safety	Dr. Loc H. Tran	20 Students and 10 faculty members from YU, West YU, East YU, Dagon University, DOF
17 July 2015 (4 hours)	Aquaculture Investment Forum	Dr. Kevin Fitzsimmons U Soe Tun May Myat Noe Lwin	29 industry stakeholders Yangon Novotel
13 to 21 August 2015 (10 hours)	Training for interns and faculty members in Yangon University	1. Dr. Kay Lwin Tun 2. Dr. Myint Myint Win 3. Dr. Pwint Thu Aye 4. Dr. Mya Zin Oo 5. Dr. Moe Thandar Oo 6. Dr. Hnin Hnin Htay	10 potential Intern students and 4 faculty members of YU
3 September 2015	USAID Scholarship award ceremony	USAID, Rectors, Proctor rectors	33 USAID, Rectors, Students and faculties of YU
25 September	Training for interns and	Dr. Kay Lwin Tun	5 Intern students and 2 faculty

to 2 October 2015 (10 hours)	faculty members in Sittwe University		members of Sittwe University
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APPENDIX 2. Scholarship Students from Yangon, Patheingyi and Mandalay Universities.

No	Student name	Sex	University	Home Province
1	Ms Hnin Yati (First Year, Zoology)	Female	YU	Thandwe Township, Rakhine State
2	Ms Soe Kabyar Thein (First Year, Zoology)	Female	YU	Yedashe Township, Bago Region
3	Ms Phyo Khine Thin (Second Year, Zoology)	Female	YU	Mingalar Taungnyunt Township, Yangon Region
4	Ms Hnin Thwet Thwet Wai (Second Year, Zoology)	Female	YU	Pyinmana Township, Nay Pyi Taw
5	Ms Htet Swe Zin Aung (MSc student, Zoology)	Female	YU	Tamwa Township, Yangon Region
6	Mg Yel Nyan Lin (MSc student, Zoology)	Male	YU	Thandwe Township, Rakhine State
7	Ma Yin Myo Thant (PhD students, Zoology, YU)	Female	YU	Aung Myay Thar Zan Township, Mandalay Division
8	Ma Nan Wai Wai Phyo (First Year, Zoology, YU)	Female	YU	Hpa-an Township, Karen State
	Patheingyi Univ Seniors		University	Home Province
	Student Name			
9	Mg Kaung Htet San	Male	PU	Patheingyi, Ayeyarwaddy
10	Mg Kyaw Soe Lwin	Male	PU	Patheingyi, Ayeyarwaddy
11	Mg Pyae Pyae Hein	Male	PU	Patheingyi, Ayeyarwaddy
12	Mg Bhom Myint Myat	Male	PU	Myan Aung, Ayeyarwaddy
13	Ma Yadanar	Female	PU	Hinthata, Ayeyarwaddy
14	Mg Soe Moe Aung	Male	PU	Taung Twin Gyi, Ma Gway Division
15	Mg Sein Than Lin	Male	PU	Phaung Pyin, Siggayine Division
16	Mg Tin Zaw Htun	Male	PU	Tant Se, Siggayine Division
17	Mg Kyaw Myo Win	Male	PU	De Pee Yin, Siggayine Division
18	Mg MinThiha Zaw	Male	PU	Myin Mu, Siggayine Division
19	Ma Ei Thazin Naing	Female	PU	Patheingyi, Ayeyarwaddy
20	Mg Min Khant San	Male	PU	Gwa, Rakhing State
21	Mg Toe Tat Aung	Male	PU	Wet Let, Siggayine Division
22	Mg Aung Moe Myint	Male	PU	Patheingyi, Ayeyarwaddy
	Patheingyi Univ Juniors			
23	Mg Htut Myat Soe	Male	PU	Patheingyi, Ayeyarwaddy
24	Mg Myo Thant Ko	Male	PU	Patheingyi, Ayeyarwaddy
25	Mg Ye Thiha Lin	Male	PU	Patheingyi, Ayeyarwaddy
26	Mg Htet Myet Aung	Male	PU	Kyaung Kone, Ayeyarwaddy
27	Ma Yhlun Le Ye	Female	PU	Da Nu Phyu, Ayeyarwaddy
28	Ma Thin Thin Oo	Female	PU	Kan Gyi Htough, Ayeyarwaddy
29	Ma Phyo Phyo Wai	Female	PU	Than Dwe, Rakhing State
30	Ma Shwe Zin Than Naing	Female	PU	Than Dwe, Rakhing State
31	Mg Than Naing Soe	Male	PU	Than Dwe, Rakhing State
32	Ma Soe Thiri Mon	Female	PU	Shwe Thauung Yan, Ayeyarwaddy
33	Ma Khin Zin Zar Kyaw	Female	PU	Gwa, Rakhing State
34	Ma Than Than Aye	Female	PU	Inn Taw, Siggayine Division
35	Mg Zin Ko Win	Male	PU	Chaung Oo, Siggayine Division
36	Mg Do Lium	Male	PU	Me Zar, Ayeyarwaddy
37	Mg Myo Htet Aung	Male	PU	Inn Taw, Ayeyarwaddy
38	Mg Myo Aung	Male	PU	Sittway, Rakhing State
39	Mg Shine Moe Tun	Male	PU	Inn Taw, Siggayine Division
40	Mg Aung Bhom Myat	Male	PU	Yan Byae, Rakhing State
41	Ma Naw Le Pwe	Female	PU	Na Pu Taw, Ayeyarwaddy
42	Mg Naing Lin Sein	Male	PU	Sin Pong We, Ayeyarwaddy
43	Mg Aung Pyae Phyo	Male	PU	In Ga Pu, Ayeyarwaddy
	PU 1st Year Honors			
44	Ma May Zun Oo	Female	PU	Inn Taw, Siggayine Division
45	Ma July Moe	Female	PU	Than Dwe, Rakhing State
46	Ma Win Hamarn Poe	Female	PU	Nga Thiyine Chaung, Ayeyarwaddy
47	Sa Aung Than	Male	PU	Nga Pu Taw, Ayeyarwaddy
48	Ma Shwe Thae Aye	Female	PU	Na Pu Taw, Ayeyarwaddy
49	Ma Zu Zu Meko Min	Female	PU	Myin Mu, Siggayine Division
50	Mg Ju Ko Ko Thet	Male	PU	Than Dwe, Rakhing State

51	Ma Su Myat Han	Female	PU	Pya Pone, Ayeyarwaddy
	PU 2nd Year Honors			
52	Mg Mg Wai Phyo	Male	PU	Pathein, Ayeyarwaddy
53	Mg Hali Nay Myo	Male	PU	Mawlamyine Kyaun, Ayeyarwaddy
54	Mg Nay Lin San	Male	PU	Than Dwe, Rakhing State
55	Mg Thu Rain	Male	PU	Sittway, Rakhing State
56	Mg Soe Min Hteik	Male	PU	Kant Ba Lu, Siggine Division
57	Mg Tint Wai	Male	PU	Kant Ba Lu, Siggine Division
58	Ma Hlaing Tha Zin Htun	Female	PU	Nga Pu Taw, Ayeyarwaddy
59	Mg Soe Thet Aung	Male	PU	Pathein, Ayeyarwaddy
	Mandalay University			
60	Wai Phyo Hein	Male	MU	Mahaaungmyay, Mandalay
61	Aye Pwint Phyu	Female	MU	Tharzi, Mandalay
63	Hnin Phyu Wai	Female	MU	Yaenangyaung, Magway
64	Myat Pan San	Female	MU	Pyigyidagon, Mandalay
65	May Myat Noe	Female	MU	Thabeikkyin, Mandalay
66	Ei Thanda Thein	Female	MU	Patheingyi, Mandalay
67	Thazin Ko Ko	Female	MU	Chanayethazan, Mandalay
68	Min Thurain Kyaw	Male	MU	Aungmyaythazan, Mandalay
69	Myat Noe Thu	Female	MU	Sagaing, Sagaing
70	Hay Mar Aung	Female	MU	Minbu, Magway
71	Yin May Lwin	Female	MU	Sagaing, Sagaing
72	Nu Nu Hlaing	Female	MU	Meiktila, Mandalay
73	Pwint Phyu Aung	Female	MU	Shwebo, Sagaing
74	Theingi Myat Myat	Female	MU	Moenyin, Kachin
75	Pyie Phyo Hein	Male	MU	Pakokku, Magway
76	May Thyu Zin	Female	MU	Monywa, Sagaing
77	Phyo Thitsa	Female	MU	Myingyan, Mandalay
78	Myo Thiri Kyaw	Female	MU	Chanmyathazi, Mandalay
79	Khaing Mi Mi Htut	Female	MU	Aungmyaythazan, Mandalay
80	Khin Mu Mu Thin	Female	MU	Aunglan, Magway
81	Khin Thit Aung	Female	MU	Chanmyathazi, Mandalay
82	Yan Myo Naing	Male	MU	Nyaung-U, Mandalay
83	Kay Zin Win	Female	MU	Myingyan, Mandalay
84	Thae Su Win	Female	MU	Sagaing, Sagaing
85	Nilar Win	Female	MU	Chaung-U, Sagaing
86	Hta Oo Wai	Female	MU	Indaw, Sagaing

APPENDIX 3. Intern Students from Yangon, Mawlamyaing, Magwe, and Sittwe Universities.

	Student Name	Sex	University	Home Province	Host from Private Sector
1	Ms Aye Aye Aung, PhD Student (May to Sept 2015)	Female	YU	A Bit Village, Chaung Zone Township, Mon State	Anawa Devi Fish processing Plant Contributions: Anawa Devi supports lunch box YU supports accommodation
2	Mr Aung Soe Lwin, PhD Student (May to Sept 2015)	Male	YU	Sanay Village, Kyauk Phyu Township, Rakhine State	Oakkan Fish Farm Contributions Fish farm owner Mr Myo Aung supports meal and accommodation
3	Mr Yang Naung Tun, PhD Student (May to Sept 2015)	Male	YU	Mayangone Township, Yangon Region	Oakkan Fish Farm Contributions: Fish farm owner Mr Myo Aung supports meal and accommodation
4	Ms Myat Su Hlaing MRes Student (July to Nov 2015)	Female	YU	Kyauk Taw Township, Rakhine State	Anawa Devi Fish processing Plant Contributions: Anawa Devi supports lunch box YU supports accommodation
5	Ms That Su Myat Chal MRes Student (July to Nov 2015)	Female	YU	Chauk Township, Magwe Region	Regal Spring and Anawa Devi Fish Processing Plant Contributions: Salary from Regal Spring?? Anawa Devi supports lunch box YU supports accommodation
6	Ms Swe Swe Aung, MRes Student (July to Nov 2015)	Female	Mawlamyaing University	Set Thwe Village, Mudon Township, Mon State	Shwe Yamone Shrimp Processing Plant Contributions: Shwe Yamone supports lunch box and transportation
7	Ms Hnin Yu Wai, MSc Student (Sept 2015 to Jan 2016)	Female	Magwe University	Chauk Townshi,p, Magwe Region	Htoo Thit feedmill Contributions: Htoo Thit supports lunch box and transportation
8	Ms Aye Aye Aung, PhD Student (Sept 2015 to Jan 2016)	Female	YU	A Bit Village, Chaung Zone Township, Mon State	Shwe Zin Yaw Hein Fish Landing Site (Jetty) Contributions: SZYH supports lunch box, YU supports accommodation
9	Mr Aung Kyaw Htat, MSc Student (Sept 2015 to Jan 2016)	Male	Sittwe University	Taunggoke Township, Rakhine State,	Data collecting from shrimp and fish farms in Rakhine Region Contributions: Myanmar Shrimp Association supports transportation Sittwe University supports accommodation
10	Ms Hnin Thandar Win (Sept 2015 to Jan 2016)	Female	Sittwe University	Kyat Khin Tan Village, Sittway Township, Rakhine State, Myanmar	Data collecting from shrimp and fish farms in Rakhine Region Contributions: Myanmar Shrimp Association supports transportation Sittwe University supports accommodation
11	Ms. Khin Win Thein (Sept 2015 to Jan 2016)	Female	Sittwe University	Minbya, Rakhine State	Data collecting from shrimp and fish farms in Rakhine Region Contributions: Myanmar Shrimp Association supports transportation Sittwe University supports accommodation
12	Ms. Soe Myint Khine, Mres Student (Sept 2015 to Jan 2016)	Female	Sittwe University	Myauk –U Township, Rakhine State	Min Zar Ni Fish processing Plant Contributions: -Min Zar Ni supports meal Sittwe University supports accommodation
13	Mr Aung Soe Lwin, PhD Student (Dec 2015 to May 2016)	Male	YU	Sanay Village, Kyauk Phyu Township, Rakhine State	Department of Aquaculture Pathology, Nong Lam University, Vietnam Contributions Nong Lam University supports accommodation??
14	Ms Moe Thandar PhD (Dec 2015 to May 2016)	Female	YU	Botataung Township, Yangon Region	Department of Aquaculture Pathology, Nong Lam University, Vietnam Contributions Nong Lam University supports accommodation??
15	Mr Yang Naung Tun, PhD Student (Dec 2015 to May 2016)	Male	YU	Mayangone Township, Yangon Region	Department of Biological Science, Universiti Tunku Abdul Rahman, Malaysia Contributions: UTAM waives tuition fees
16	Ms Su Zin Mar Htun (Dec 2015 to May 2016)	Female	Sittwe University	Pauktaw Township, Rakhine State	Department of Biological Science, Universiti Tunku Abdul Rahman Malaysia Contributions: UTAM waives tuition fees

APPENDIX 4. Corporate partnerships.

Private company	Area of partnership	Status
DuPont	R&D, feed formulation and processing, feed quality and feeding practices, fish/shrimp nutrition, health management, farm management practices, and student intern	Will recruit one intern Will host workshop on aquaculture
Tiran	Introducing new strain of male tilapia, introducing neo-male <i>Macrobrachium</i> (prawns) broodstock, and support technical book and journals for library at MFF	Books and journals transported from Israel to Yangon.
Ripple Fish	Importing juvenile eels and eel nursery	Imports delayed from Madagascar
Regal Springs	Tilapia cage farming, Site visits lakes	One intern recruited
Handy Seafood	Introducing new soft shell and crab fattening suppliers; conduct workshops to demonstrate proper farm sanitation practices, mangrove replantation, and efficient and sustainable crab hatchery operations, and student intern	Delayed waiting for crab hatchery and sanitation projects to start.
USSEC	Feed and nutrition and demonstration farm site Joint workshops and farm visits	Feed for Seabass at Okkan Mandalay and Taunggi Provided lodging expenses



APPENDIX 5. Activities of Project Office of Sea Food Project for August.

	date	Whom met	Point of discussion
1	4-8-2015	Dr. Tun Lwin	Myanmar Climate change and flood situation presentation by Dr. Tun Lwin at MFF
2	6-8-2015	U Myo Aung farm	Went to check the Okkan seabass farm to check the flood situation and donating blue nettings from the Sea Food Project
3	7-8-2015	Dr. Don Mackintoc and Dr. Zaw Lunn	Presentation on Crab farming and Dr. Zaw Lunn presentation of Marine Sea Park area. (Fauna and Flora International)
4	10-8-2015	Mr. Robert Calkins	Linking KMK to its previous trade partners arranged by Sea Food Project. Meeting with KMK owner U Khin Maung Kyaw and Mr. Robert Calkins from Calkins and Burke Ltd of Canada. They were regular buyers until Myanmar hit by embargo. He was trying to locate KMK Co for more than two weeks and the Project team arranged for the meeting for them.
5	11-8-2015	Stake Holders Meeting	Meeting of MFF members and Stakeholders, media and farmers at MFF from 10 to 11:30 am.
6	12-8-2015	Kick-off meeting 10 to 1 pm	Kick off meeting at NOVOTEL sponsored by Sliver Sea Journal and VEAS of Vietnam
7.	12-8-2015	USAID meeting	Meeting with Dr. James Goggin and U Khun at the meeting and farewell to Dr. James at BioScience Lab
8	13-8-2015	KMK Sea Bass harvest	KMK Seabass harvest at Sar Ma Lauk farm of Arr Sha Thar.
9	17-8-2015	U Khun	Meeting with U Khun at Aquatic Bioscience Lab on M&E
10	18-8-2015	Dr. Stephen Roberts	Meeting on co-ordination of EU and USAID Sea food Project on Seafood quality and GAP training
11	19-8-2015	Mr. Patrick Debyo	Meeting and dinner by Exporter Ass: to Mr Patrick DEBOYSER of EU. He is DG, SANTOS of EU.
12	20-8-2015	Sea Bass farm, Okkan	Visiting U Myo Aung sea bass farm to check the flood conditions and to check the water quality
13	24-8-2015	Chatrium Hotel to talk to Chef Kosol	To ask KOSOL if he would take live Sea Bass that is going to be harvested at OKKAN soon. It turn out they cannot place an order now as the season is 2 month ahead.
14	25-8-2015	Stake Holders meeting at MFF	Stake Holders meeting at which Sea Food Project announce the harvest of Sea Bass and to talk to potential buyer especially to U Than Lwin who has a collecting centre.
15	26-8-2015	Dr. Aung Kyaw Zaw	Meeting with Dr. Aung Kyaw Zaw on Artemia cyst production in Salt Pond at the Project office at MFF.
16	31-8-2015	DOF seminar on Export	WTO, SPS agreement on Trade explained by DoF, Quality control Department.



CERTIFICATE OF ACHIEVEMENT

Ei Thandar Thein

INDUCED BREEDING AND NURSERY MANAGEMENT TRAINING

July 17 ~ 19, 2015, Tha-Yet-Kone Fishery Station, Mandalay

You were conducive to the successful completion of the Induced Breeding and Nursery Management

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Myo Aung

Hla Htay
Fishery Station Officer

Myo Aung
Regional Fisheries Officer

Issued on - 19th July 2015

Appendix 7. Indicators and Targets

(Guidance: Provide a matrix that lists indicators with a brief description/measurement, data source(s), frequency of data collection, baseline values and their sources, and the annual target estimates throughout the life of the Activity (see a sample table below. Note that the information in the table below is the minimum requirement. Please insert more columns/rows as needed). Key indicators should be clearly marked if the matrix contains all indicators the implementer uses in managing the Activity.)

Indicator	Summary Description & Unit of Measurement	Data Source & Collection Method	Baseline (& Source)	Target Justification	Year 1 Target	Year 1 Actual	Total target (Life of project)
3.2.2-36 Number of USG-supported tertiary programs with curricula revised with private and/or public sector employers' input or on the basis of market research	Review of existing curricula with recommendations to update and provide additional changes in pedagogy Number of programs	Kay Lwin and Min Oo	Current curriculum	Objective A	1 Yangon	2	3
3.2.2-41 Number of individuals from underserved and/or disadvantaged groups accessing tertiary education programs	Number of individuals	Kay Lwin	Check department records to find historic numbers	Objectives B, D and F	13	28	39
3.2.2-42 Number of tertiary institution faculty or teaching staff whose qualifications are strengthened through USG-supported tertiary education programs	Faculty members attending and answering positively on surveys Number	Teaching registration forms and evaluations	Teaching registration forms and evaluations	Objective A and B	10	211	30
GNDR-2 Percentage of female participants in USG-assisted programs designed to increase access to productive economic resources (assets, credit, income or employment)	Calculate % of female participants in programs Numbers and %	Teaching registration forms and evaluations	0, new program	Objective G	75%	76%	60%
STIR-4 Person hours of	Determine total number of hours	Teaching registration	0, new program	Objectives A, B, C, D	1000	4,948	6000

training completed in science and technology workforce supported by the USG.	of workshops and training and intern time. Hours	forms and evaluations					
STIR-6 Number of scientific studies published or conference presentations given as a result of USG assistance for research programs.	Determine total number of publications and presentations	Kay Lwin, Min Oo, Fitzsimmons, Soe Tun	0, new program	Objectives A and B	4	3	20
Custom indicators							
Number of testing and research facilities made available to seafood sector	Seafood safety lab installation Number	Kay Lwin oral report U Min Oo for algae lab report	0, all lab equipment is new	Objective J	1 Yangon	1	2
Number of internships facilitated to provide field introduction to seafood operations	Interns placed in positions Number	Maung Maung Naing		Objectives B, D and F	25	16	90
Number of hatchery facilities established to increase crab population	Crab hatchery facility Number	Fitzsimmons and Soe Tun	0, new effort	Objective D	0	0	1
Number of locations with improved habitat for seafood production	Mangrove plantings Number	MM Naing	Compare to existing programs	Objective D	0	0	3
Number of non-university members receiving trainings	Deliverable Lectures/ Presentations/ Workshops Number of attendance	Soe Tun and Teaching registration forms and evaluations		Objectives A, E and F	120	199	360

Appendix 8. Cost share

Yangon University Cash or in-kind	\$	Multiples	₹	Source
Lab computer	3308		3,308	YU
Wifi	2500		2,500	YU
Signage	650		650	TF
Airfare for Jeju Kay Lwin	450		450	HE
Airfare for Jeju Myint Zu	450		450	HE
Airfare for Jeju Mya Oo	450		450	HE
Travel to PCR training	300	x12	3,600	HE
Faculty housing	45	x35	1,575	YU
Lab furniture	40	x10	400	YU
LCD projector	400		400	YU
Myanmar Fisheries Federation				
Office rental	400	x8	3,200	MFF
Wifi upgrade to reach office	500		500	MFF
WiFi monthly access	\$40	x8	320	MFF
COMET training for faculty				
Laos (professional wear)	450	x2	900	HE
Travel to Laos	500	x2	1,000	COMET
Visit to HCM to set-up interns w/ Minh Phu				
Fitz RT ticket	400		400	Minh Phu
Hotel	300		300	Minh Phu
USSEC - Hotels				
Novotel -Yangon	120	x3	360	USSEC
Sedona - Mandalay	100		200	USSEC
Shwe Bo	60		60	USSEC
Library				
Books donation			8,000	Hulata
Books donation			500	World Aquaculture Society
Books transfer			3,000	Tiran
Internships	To be determined	x16		
Current total			\$32,523	