

Implementation Unit	Environmental Education Centre
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1. Project:

Phase-II University Social Responsibility (USR) Project (2020–2022): “Co-Developing Fangyuan and Dacheng: Industrial and Environmental Sustainability of Fangyuan and Dacheng, Changhua”

This project targeted Haha Fish Farm as the demonstration field and extended its scope of cooperation to the Changhua Aquaculture Association and Youth Aquaculture Association to broaden the scope of concern. The Changhua Aquaculture Association was formed by core members with considerable experience in aquaculture, some of whom were recruited as lecturers to educate university students and give them more extensive and in-depth insights into the local industry. This project also aimed to help more local fishermen engage in eco-friendly aquaculture, promote product traceability, and enlist the help of the University’s professional faculty members in product marketing and packaging.

This project aimed to help students understand, develop a passion for, make good use of, and cherish the ocean, working with them to propose solutions to local problems along the coast of Changhua. Students with a passion to serve and give back to the community were also organised into a water quality team, which ventured into the rural Fangyuan and Dacheng areas to help local fish farmers address various problems. Water quality of the coastal waters and fish farms was regularly tested to prevent fishermen from drawing poor-quality sea water for aquaculture. Invasion by introduced species of mussels was also actively prevented and controlled to reduce the chance of mortality in Asian hard clams (*Meretrix lusoria*) caused by byssal attachments of introduced mussels to their shells. In conjunction with the Changhua Aquaculture Association, this project promoted the use of photosynthetic bacteria to increase the ratio of probiotics in aquaculture ponds and improve the environmental quality. As an approach to fight bacteria with bacteria, native species of *Bdellovibrio* were cultured to increase the control rate of bacterial diseases in Asian hard clam ponds and improve the water quality of fish farms.

2. Outcomes:

- (i) To address the sudden death of Asian hard clams and the ageing workforce in the industry, the project team cooperated with the Changhua Aquaculture Association and signed a letter of intent for cooperation with the Department of Aquaculture of the National Taiwan Ocean University (NTOU), from which experts in Asian hard clam aquaculture were invited to provide in-depth advice. This project also enlisted the help of Professor Hong-thih Lai (Vice-President of the Taiwan Branch of the Asian Fisheries Society) from the Department of Aquatic Biosciences of the National Chiayi University (NCYU), for his expertise in water and substrate quality analysis, in systemically resolving the sudden death of Asian hard clams. Students were also encouraged to participate in solving local issues, to attract young people to return and seek employment in the local region and promote placemaking.

- (ii) This project helped more local fishermen engage in eco-friendly aquaculture, promoted product traceability, and facilitated the marketing and packaging of Asian hard clam products with the combined effort of the University's professional faculty members and students. Scholars and experts from the Fisheries Research Institute of Council of Agriculture, NTOU, NCYU, and other institutions were also invited to counsel local fish farmers and fishermen. In accordance with eco-friendly aquaculture, green energy could be incorporated in the future.
- (iii) Active steps were taken to nurture local environmental educators, including a 24-hour local teacher education course to afford students along the rural coast the opportunity to receive environmental education and be informed of its importance. Two environmental educator training programs, for 33 and 120 hours, respectively, were offered to cultivate local 'seed teachers' who would be capable of identifying and solving local issues. A professional project team was also formed by cross-disciplinary scholars and experts from the University and other schools to raise awareness on environmental sustainability topics, such as the Asian hard clam aquaculture industry, beach clean-up and wetland conservation, eco-friendly aquaculture, food safety, green energy, and community regeneration. This project also partnered with local associations in promoting green energy, energy conservation, carbon reduction, and eco-friendly activities, and in transforming the fishing villages, while also nurturing skilled talents in environmental education promotion, eco-friendly aquaculture technology, and community transformation and regeneration to improve environmental and industrial quality and enhance the sustainable operations and use of the environment.
- (iv) Through active collaboration, this project also provided food and agriculture education and training for aspiring local teachers and environmental educators at primary and lower secondary schools. It facilitated the implementation and application for related projects in conjunction with local communities. The initiatives included the provision of food and agriculture education in Wanggong Elementary School, Yuhua Elementary School, Houliao Elementary School, and Caohu Junior High School, and initiatives relating to engagement with and transformation of fishing villages, talent development in community transformation and regeneration, and sustainable environmental operations and use in places like the Xinsheng community, Jianping community, Fangyuan Township Office, and Hanbao Village Office.

- (v) As green energy experts and consultants for the Environmental Education Center, Professors Jung-bi Wei and Liang-ruei Chen from the University's Department of Electrical Engineering were invited to join the project. With their help, this project organised a number of environmental education courses and workshops on solar photovoltaics and green energy to promote energy conservation, carbon reduction, green energy, environmental protection, and other sustainable green-energy strategies. They also assisted in the conduct of more comprehensive assessments.
- (vi) This project advocated eco-friendly aquaculture with no pollution or pumping of underground freshwater and the transformation of the tourism industry to improve drug abuse in aquaculture and the overuse of drugs and land subsidence arising from excessive groundwater pumping. Thus, it helped safeguard Taiwan's lands, improve the aquaculture environment, produce safe and non-toxic ingredients, and create new opportunities for fishing villages, leading to increased employment, the return of youths, successful placemaking, and a sustainable environment.
- (vii) To establish the University as a driving force for regional development and placemaking, a team dedicated to sustainable industrial operations was formed, focusing on engaging with and transforming fishing villages in Fangyuan Township, Changhua County. Based on their areas of expertise in environmental education and biology, the team shed light on and offered counselling on various matters, nurtured talents in community transformation and regeneration, and promoted sustainable environmental operations and use. In 2020, 24 sessions of workshops on the aquaculture industry and local cooperation were organised, attracting 767 attendees in total; 12 preparatory experts' meetings on locally related matters were also held and recorded 214 attendees. The team also took part in organising the Hanbao Sunset Concert, which was attended by 80 participants. The event was supported by the presence of the Magistrate of Changhua County, county and city councillors, a member of the Legislative Yuan, a member of the Control Yuan, presidents of both organising universities, and representatives from the development associations of various regions. It had proven successful in promoting local characteristics, advocating social entrepreneurship, and publicising local agricultural and fishery products, in turn creating more quality job opportunities and advancing regional transformation and placemaking.

Theme of course/event	No. of sessions	No. of attendees	Event expenses (NTD)
Preparatory meeting by Changhua West Coast Development Committee	4	112	0
Expert consultation meeting with the village chief of Fangyuan	3	45	0
Executive meeting of the Hanbao Music and Food Festival	2	20	0

Meeting with consultant from Environmental Protection Bureau, Changhua County	1	7	0
Wanggong and Fangyuan DMO Meeting	1	23	0
Beach clean-up and value adding meeting on Fangyuan's ocean waste	1	7	0
Hanbao Music and Food Festival	1	80	8,000
Youths' workshop on preserving traditional crafts by Changhua Fisheries Association	1	49	6,000
Workshop on embedding specimens in epoxy resin	1	42	18,000
Green Energy to My Home Workshop	4	101	26,880
Workshop on common fish diseases in aquaculture, prevention, and treatment	1	39	20,680
Food and agriculture education workshop with Caohu Junior High School	2	56	12,000
Workshop on improving the environment of aquaculture ponds	1	35	20,200
Food and agriculture education workshop with Fengming Junior High School	1	30	60,00
Workshop on product traceability and wetland seal	1	42	6,000
Green energy and fisheries workshop	1	26	9,120
Workshop on the ecology of coastal wetlands	2	84	20,000
Home repair course and workshop for women	4	92	36,480
Experiential workshop on the cattle cart industry in coastal Wanggong	1	42	31,346
Workshop on the sustainability of coastal ecological resources	1	55	68,081

33-hour course for training teachers and environmental educators	10	150	139,161
24-hour course for training teachers and environmental educators	10	230	87,600
120-hour course for training teachers and environmental educators	32	608	363,847
Workshop on protecting Taiwanese humpback dolphins	1	44	91,20
Workshop on green energy and diverse learning	2	30	13,440
Sub-total	88	2,049	886,835

Corresponding SDG indicator(s)	<input checked="" type="checkbox"/> SDG01 <input checked="" type="checkbox"/> SDG02 <input type="checkbox"/> SDG03 <input checked="" type="checkbox"/> SDG04 <input type="checkbox"/> SDG05 <input checked="" type="checkbox"/> SDG06 <input type="checkbox"/> SDG07 <input type="checkbox"/> SDG08 <input type="checkbox"/> SDG09 <input type="checkbox"/> SDG10 <input type="checkbox"/> SDG11 <input type="checkbox"/> SDG12 <input type="checkbox"/> SDG13 <input checked="" type="checkbox"/> SDG14 <input type="checkbox"/> SDG15 <input type="checkbox"/> SDG16 <input type="checkbox"/> SDG017
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Supporting photos



Caption: Members of the water quality team and local fish farmers testing the waters of a fish farm.



Caption: Local workshop and interviews on common fish diseases and their prevention and treatment.



Caption: An environmental education course for educating students on green energy.



Caption: Expert Consultation Meeting on Improving Aquaculture in the Fangyuan Region: From 'Wild' Energy to Wind Energy.



Caption: Youth workshop on preserving traditional crafts by the Changhua Fisheries Association



Caption: Workshop on the sustainability of coastal ecological resources



Caption: Wanggong and Fangyuan DMO Meeting



Caption: Promotional activity for the Hanbao Music and Food Festival

Related links

- ★ TaiwanHot.net - Travelling Light in Changhua: Hui-mei Wang Tries Being a Fisherwoman for a Day, <https://reurl.cc/NrMK4Q>
- ★ TechNews - Joint Statement Issued by Offshore Wind Power Companies Seeking NT\$5.8 Feed-in Tariffs, <https://reurl.cc/qgA7zn>
- ★ We Love Taiwan Coastal Clean-up's Facebook page, <https://reurl.cc/EnlxKm>
- ★ Ni Tsat Co., Ltd.'s Facebook page, <https://reurl.cc/4azVr3>
- ★ Changhua County Government - Hanbao Music and Food Showcase: Seeking Opportunity in Crisis, Adding Value through Innovation, and Renewing Regional Image, <https://reurl.cc/9rNeXY>