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| 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 the Haha Fish Farm as the demonstration field and extended its scope of cooperation with 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 provide them with 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.

The project helped the 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 Changhua coast. Students with a passion to serve and give back to the community were organised into a water quality team, which ventured into the rural Fangyuan and Dacheng areas to help local fish farmers solve 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 deaths 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 National Taiwan Ocean University (NTOU), from where 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 Asian Fisheries Society), an expert in water and substrate quality analysis from the Department of Aquatic Biosciences of National Chiayi University (NCYU), to systemically resolve the sudden deaths of Asian hard clams. Students were also encouraged to participate in solving local issues, in order 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 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 jointly counsel local fish farmers and fishermen. Green energy could be incorporated in the future for more eco-friendly aquaculture.
- (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' 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 of 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 rebuilding. This project also partnered with local associations in promoting green energy, energy conservation, carbon reduction, and eco-friendly activities and transforming the fishing villages. It also focussed on nurturing skilled talents in environmental education promotion, eco-friendly aquaculture technology, and community transformation and rebuilding to improve environmental and industrial quality and enhance the sustainable operations and use of the environment.
- (iv) Through active collaboration, this project provided food and agriculture education and training for becoming local teachers and environmental educators with primary and lower secondary schools and facilitated the implementation and application for related projects in conjunction with local communities. These projects included the provision of food and agriculture education in the Wanggong Elementary School, the Yuhua Elementary School, the Houliao Elementary School, and the Caohu Junior High School and initiatives relating to engagement with and transformation of fishing villages, talent development in community transformation and rebuilding, and sustainable environmental operations and use in places including the Xinsheng community, the Jianping community, the Fangyuan Township Office, and the 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 many 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 and conducted more comprehensive assessments.
- (vi) The project advocated eco-friendly aquaculture with no pollution or pumping of underground freshwater and the transformation of the tourism industry to radically improve drug abuse in aquaculture and the overuse of drugs and land subsidence arising from excessive groundwater pumping. By doing so, 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 of regional development and placemaking, a team dedicated to sustainable industrial operations was formed, focussing on engaging with and transforming fishing villages in Fangyuan Township, Changhua County. Based on expertise in environmental education and biology, the team explains and provides counselling on various matters, nurtures talents for community transformation and rebuilding, and promotes sustainable environmental operations and use. In 2020, 24 sessions of workshops on the aquaculture industry and local cooperation were organised, attracting 767 attendances in total; 12 preparatory experts' meetings on locally related matters were also held and recorded 214 attendances. The team also participated 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 session(s) | No. of attendances | Event expenses (NT\$) |
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| Preparatory Meeting by Changhua West Coast Development Committee | 4 | 112 | 0 |
| Expert Consultation Meeting with Chief of Village in Fangyuan | 3 | 45 | 0 |

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| Executive Meeting of the Hanbao Music and Food Festival | 2 | 20 | 0 |
| Meeting with consultant from the Environmental Protection Bureau, Changhua County | 1 | 7 | 0 |
| Wanggong and Fangyuan DMO Meeting | 1 | 23 | 0 |
| Beach Cleanup 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 the 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 the Fengming Junior High School | 1 | 30 | 6,000 |
| 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 |

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| Workshop on the Sustainability of Coastal Ecological Resources | 1 | 55 | 68,081 |
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| 33-hour course for training teacher and environmental educators | 10 | 150 | 139,161 |
| 24-hour course for training teacher and environmental educators | 10 | 230 | 87,600 |
| 120-hour course for training teacher and environmental educators | 32 | 608 | 363,847 |
| Workshop on Protecting Taiwanese Humpback Dolphins | 1 | 44 | 9,120 |
| Workshop on Green Energy and Diverse Learning | 2 | 30 | 13,440 |
| Sub-total | 88 | 2,049 | 886,835 |

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| 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"/> SDG17 |
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Supporting photos



Caption: The water quality team and local fish farmers are testing the water of a fish farm



Caption: Local workshop and interviews on common fish diseases and other diseases



Caption: An environmental education course for educating students about green energy



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



Caption: Youths' Workshop on Preserving Traditional Crafts by 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>