



Times Higher Education
Impact Rankings

SDG

2

Zero Hunger



SDG 2.2.1 Campus food waste tracking

1. NCUE tightly controls the food waste of its two school cafeterias.

NCUE measures and manages the daily food waste of the two school cafeterias. Statistics showed that the average daily food waste generated by the two school cafeterias in 2022 was lower than 0.022 tonnes. Compared to 2021, the daily average food waste generation at NCUE has decreased by 0.003 tonnes. Please refer to Table 1.

Table 1. Daily Average Food Waste Generation at NCUE

Year	Daily Average Food Waste Generation	Reduction in Food Waste Compared to the Previous Year
2022	0.022 tonnes	0.003 tonnes
2021	0.025 tonnes	

Note: The calculation formula is based on the year 2022.

Daily Average Food Waste Generation = Annual Food Waste / Total Working Days in a Year (5 days a week × 52 weeks).

$5.72 \text{ tonnes} / 260 \text{ days} = 5,720 \text{ kilograms} / 260 \text{ days} = 22 \text{ kilograms per day} = 0.022 \text{ tonnes}.$

2. NCUE has implemented a food waste reduction policy.

(1) NCUE's food waste reduction policy is as follows:

- (a) Promoting nutrition education and food appreciation, and encouraging students to take only what they can eat, not pick at food, and not leave leftovers.
- (b) Requesting vendors to estimate the number of diners for food preparation.
- (c) Regularly assessing the food waste situation and adjusting the menu accordingly.
- (d) Implementing time-limited promotional offers to reduce leftovers. For details on the school cafeteria's promotional measures, please refer to Annex 2.1.1A.

(2) As part of NCUE's food waste reduction policy, the two school cafeterias classify the daily food waste generated with food waste bins placed in both school cafeterias. Specially appointed cleaners collect the food waste every day, and designated enterprises regularly collect the food waste for resource recycling. The methods and strategies for reducing food waste are as follows:

- (a) NCUE adopts a standardized production process when preparing meals that uses ingredients effectively and reduces the serving portions to ensure that the teachers and students can finish all their food, reducing waste. (Figure 1)



Figure 1. The small portions of delicious foods offered in the student cafeterias of NCUE.

(b)NCUE regulates the selection, purchase, and management of ingredients to ensure that vendors' procurement, processing, and inventory follow standard procedures. Vendors closely monitor the inventory and freshness of all kinds of food to ensure safe and effective use. Food nearing its expiration date is made into 'light lunch boxes' or 'lunch boxes under 50 NTD' to promote sales, reduce waste, and ensuring food safety. The cafeterias' effective use of ingredients enables teachers and students to enjoy nutritious food at low prices to reduce their financial burden and food waste.

Please refer to Annex 2.1.1A for details on School Cafeteria Discount Measures.

SDG 2.2.2 Indicator: Campus food waste

Data Collected: Total food waste

1. Low average food waste

After measuring the total food waste generated by the school cafeterias at both of NCUE’s campuses in 2022, the total food waste amounted to 5.72 tonnes (5,720kilograms), resulting in an average daily food waste per faculty member and student of less than 2.75 grams. Compared to the 6.5 tonnes (6,500kilograms) of food waste generated in 2021, which resulted in an average daily food waste per faculty member and student of 3.16 grams, this reduction of 0.41 grams indicates a notable improvement in food waste reduction efforts. Please refer to Table 1.

Table 1. Daily Average Food Waste per Faculty Member and Student

Year	Yearly Food Waste Generation	Average Daily Food Waste per Faculty Member and Student	Average Daily Reduction in Food Waste per Faculty Member and Student Compared to the Previous Year
2022	5.72 tonnes	2.75 grams	0.41 grams
2021	6.5 tonnes	3.16 grams	

Note: The calculation formula is based on the year 2022.

(1)Daily average food waste generation = Annual food waste / Number of working days in a Year (5 working days per week × 52 weeks = 260 days): 5.72 tonnes / 260 days = 0.022 tonnes (22,000 grams).

(2)Average food waste per faculty member and student = Daily food waste/Total number of faculty members and students in the school (7,162 students + 827 faculty members = 7,989 people): 22,000 grams / 7,989 people = 2.75 grams.

2. Discouraging food waste

NCUE abides by the United Nations’ principle of avoiding food waste, asking teachers and students to “purchase food that you can finish but not more.” NCUE encourages the cafeterias to purchase ingredients from local farmers. This allows them to make the freshest, most delicious meals while also reducing the carbon footprints associated with transporting the ingredients. (Figure 2)

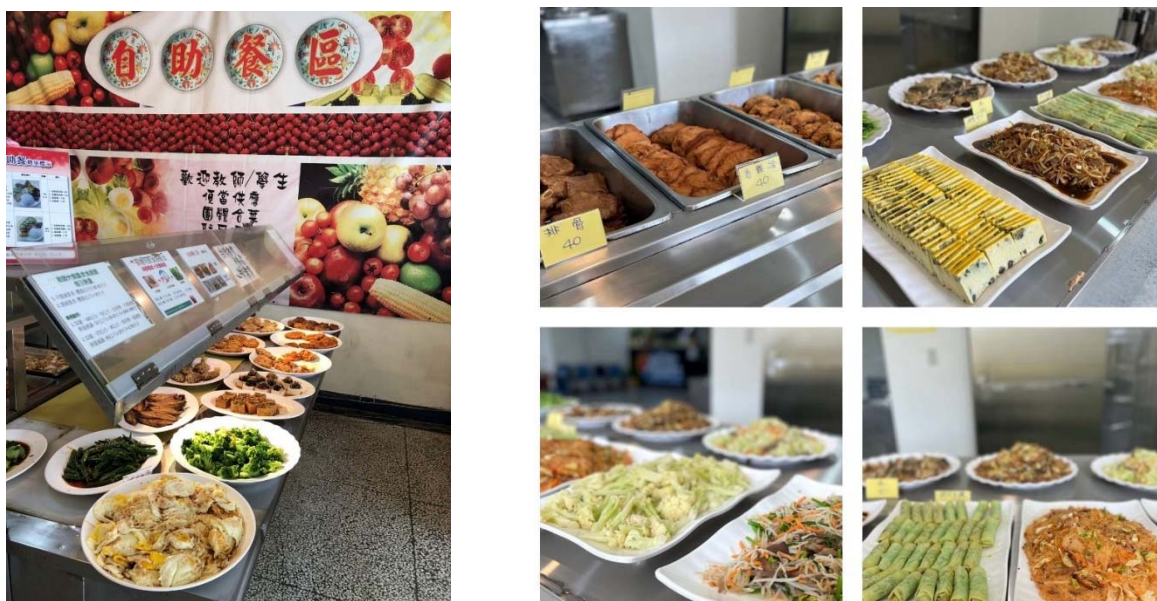


Figure 2. Buffet-style meals made by our school cafeterias with local ingredients

Data Collected: Campus population

The campus population is 7,989, with 7,162 students in day-time courses and 827 staff members.

1. A total of 7,162 students: 4,988 in bachelor's programs; 1,686 in master's programs; 488 in doctoral programs. For campus population, please refer to Figure 3.

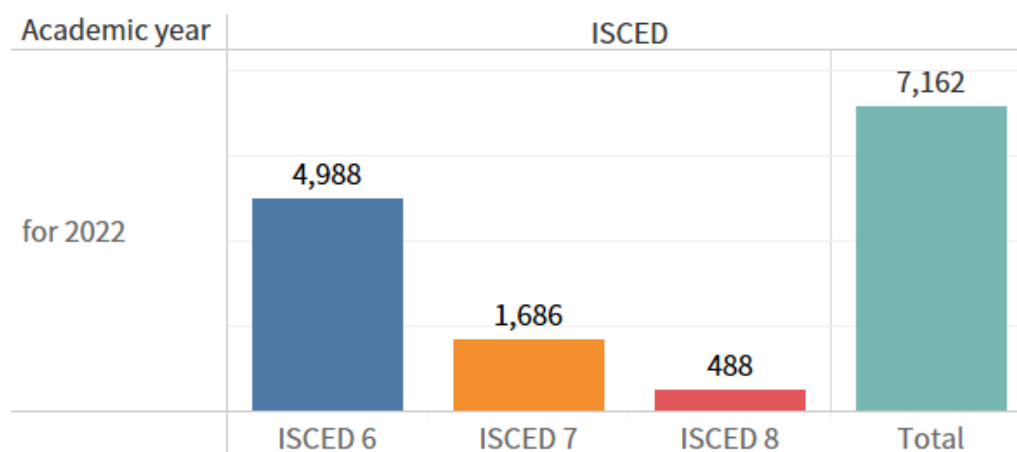


Figure 3. Campus Population

2. A total of 827 staff members: 368 teachers, 90 staff members, 6 technicians, 212 employees in the school fund, and 151 project assistants in the program. For faculty numbers, please refer to Figure 4.

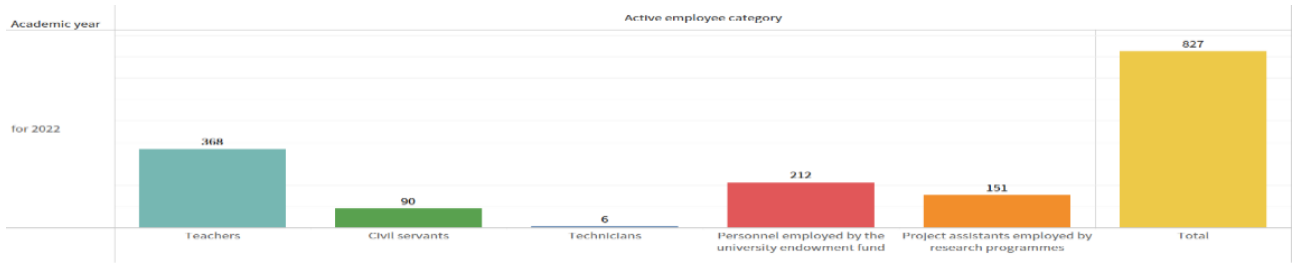


Figure 4. Faculty Numbers

SDG 2.3.1 Student food insecurity and hunger

Following a three-level management mechanism for campus food safety and hygiene, NCUE cooperates with the Ministry of Education to conduct on-site guidance every academic year. NCUE has also set up a food management committee to coordinate work across units. Nurses appointed to serve as hygiene supervisors inspect the catering places every week, checking the campuses' food safety for teachers and students. NCUE places significant importance on campus food safety and endeavors to support students in alleviating hunger-related concerns. This commitment is upheld by continuously improving food safety protocols and risk management measures in its school cafeterias. NCUE has established a responsive feedback system to promptly address any food-related inquiries from faculty numbers and students. NCUE maintains an outstanding food safety track record, with zero instances of food poisoning to date. For detailed food safety records, please refer to Table 1.

Table 1. Food Safety Records

Year	Number of Food Hygiene Supervision	Incidents of Food Poisoning
2020	32	0
2021	26	0
2022	34	0

1. Food safety management measures for school cafeterias:

(1) NCUE has school cafeterias at both the Jinde and Baoshan campuses. Both cafeterias use ingredients registered on the Ministry of Education's ingredient source database in accordance with the Ministry's regulations. They use local seasonal ingredients to provide the teachers and students with a variety of safe, healthy, and delicious meals. (Figure 1)



Figure 5. Diversity of food options provided at cafeterias and restaurants on the campus of NCUE.

(2) To ensure the safety of the food consumed by the teachers and students, NCUE has implemented a Zero Food Safety Incident Policy, food safety education and management measures since 2014. The relevant measures are as follows:

- (a) Education and training for the catering staff: NCUE notifies them of the latest health and safety regulations and food safety information and requires thorough and reliable execution.
- (b) NCUE compiles standard operating procedure lists and checklists of food safety to establish controllable and manageable sanitation procedures. The safety procedures ensure that personnel can immediately identify and review the key problems when food safety incidents happen and solve the problems quickly.
- (c) Food ingredients registration: NCUE controls food safety by monitoring the source of all ingredients. The cafeterias properly manage and control the ingredients, checking them one by one against the information registered on the Ministry of Education's ingredient source database.
- (d) Internal and external third-party supervision teams assist NCUE in supervising and improving the safety and hygiene of school cafeterias.
 - i. Nurses visit the school cafeterias every week to check the hygiene.
 - ii. The Changhua County Public Health Bureau helps implement annual food safety and hygiene inspections of NCUE's school cafeterias.
 - iii. Together with the agricultural and health authorities, the Ministry of Education conducts random checks on the management and maintenance conditions of NCUE's food safety to maintain NCUE's food safety and health and improve the quality.

Annex 2.3.1A for the NCUE Management Measures for School Cafeterias.

2. NCUE has adopted these specific measures to encourage teachers and students to maintain a safe and healthy diet:

- (1) The menus of NCUE's cafeterias emphasize healthy eating, including vegetarian and vegan meal options, to protect the well-being of its teachers and students and respect Taiwan's eating habits. Diners can enjoy a variety of foods, including selections from the self-service fruit and vegetable bars, to achieve a healthy, enjoyable, and balanced diet.
- (2) The cafeterias post nutrition guides and knowledge about healthy diets to encourage teachers and students to eat safe, healthy foods: the dining tables show suggestions for mixing different food types; wall posters and TV screens offer nutrition information and health education guidelines. And nutritionists visit to share healthy diet tips. The cafeterias also hold fun activities such as garden parties with 'vegetable battles' to convey dietary health knowledge. (Figure 6)



Figure 6. Suggestions on healthy diets are posted on the meal pick-up tables to enhance teachers' and students' knowledge regarding healthy dieting

SDG 2.3.2 Students and staff hunger interventions

1. NCUE gives free meal coupons to economically disadvantaged students to solve student hunger problems.

NCUE recognizes that some students face difficulties in their lives (e.g., low income, family issues and emergencies) that can lead to them going hungry. NCUE encourages those students to apply for the Jin-Pyng Wang Emergency Bursary and Meal Coupons for Students under Poverty Line. This program provides students in difficulty with free meal coupons so they can focus on their studies rather than worrying about how they will afford to eat.

The application forms for the free meal coupons are available on NCUE's website. After approval, students can use the coupons at any counter in the school cafeterias to select from a variety of nutritionally balanced foods. For the coupon format, please refer to Figure 7. These free meal coupons have been available since 2009, and in recent years, hundreds of people have applied for them. In 2022, 148 students received free meal coupons at a cost to NCUE of only 660,750 NTD. Please refer to Annex 2.3.2C.



Figure 7: NCUE's free meal coupons

Annex:

Annex 2.3.2B - Key Points for Applying Free Meal Coupons

Annex 2.3.2C - Summary Table of Meal Coupon Users

Annex 2.3.2D - Photos of student food safety strategies

2. Diverse foods are available on campuses for long hours every day to meet the dietary needs of students and staff.

(1) NCUE has a program that issues free campus meal coupons to economically disadvantaged students. Students can use the coupons at any counter in the school cafeterias to select from a variety of nutritionally balanced foods so they can focus on their studies rather than worrying about how they will afford to eat.

- (2)The cafeterias in the campuses are open for 14 hours daily (06:30–20:30), offering breakfast, lunch, and dinner to meet the dietary needs of teachers and students.
- (3)Various locations around both campuses and all the student residence halls have vending machines selling instant noodles (As shown in Figure 8), beverages and coffee are available to meet the dietary needs of teachers and students when the cafeterias are closed.



Figure 8. Vending Machines in Student Dormitories

- (4)The Baoshan campus has recently opened a 24-hour convenience store that provides food to meet the dietary needs of teachers and students. That campus also has a comfortable, creatively decorated café (As shown in Figure 9) where teachers and students can enjoy coffee and relax.



Figure 9. Creative Cafeteria on Baoshan Campus

Annex:

Annex 2.3.2A - Measures including the introduction of school cafeterias

SDG 2.3.3 Sustainable food choices on campus

NCUE offers diverse dining options to meet the food needs of teachers and students and consider their nutritional needs and health.

1. Both NCUE campuses have cafeterias that provide comfortable and clean dining areas for the teachers and students.

All NCUE's cafeterias are self-service restaurants, with vegetables-base and meat-based meals placed in different zones for easy identification by non-vegans, semi-vegetarians, and ovo-lacto vegetarians. Various cafeteria locations show calorie labels to assist diners in achieving a healthy diet while enjoying affordable and delicious meals.

2. NCUE's cafeterias follow multilevel and multifaceted management protocols to maintain optimum hygiene.

NCUE's hygiene measures include self-management, ingredient registration, supervision by external hygiene authorities, supervision by internal hygiene teams, supervision by the food management committee, and hygiene consultations for universities and colleges to provide the faculty members and staff with a comfortable and clean dining environment and a nutritious and healthy diet. The cafeterias offer a variety of food-court services for breakfast, lunch, and dinner. They also offer buffets of Chinese food and light meals; Western-style cakes, fruit, and ice bars; and local snacks. (Figure 1)



Figure 1. Various Dining Services Offered at NCUE's Cafeterias

3. NCUE's food management committee holds at least two meetings every year and conducts weekly food hygiene and environmental inspections to supervise the cafeterias' food safety effectively.

4. Representatives from the Ministry of Education and various corporations visit the cafeterias to provide guidance on providing healthy food services to NCUE's teachers and students.

Annex 2.3.3A - Diversified Catering Services of School Cafeterias and their Supervision

SDG 2.3.4 Healthy and affordable food choices

NCUE is committed to providing food safety, healthy, and affordable meals, so its teachers and students can enjoy sufficient and diverse meals in the cafeterias at a low cost. The cafeterias regularly earn praise from NCUE's teachers and students. The school cafeteria management guidelines follow the Student Catering Venue Rental Contract and the Management Measures at Cafeterias requirements. In addition to ensuring nutritional, healthy, and safely handled foods in a hygienic environment, the cafeterias also hold promotional activities that are well received by teachers and students and periodically provide discount information. The supervision measures for the cafeterias are as follows:

1. Meal prices are set according to the Student Catering Venue Rental Contract and the Management Measures at Cafeterias:

- (1)The cafeterias must provide meals at low prices. The unit price must be shown clearly for the teachers and students to read.
- (2)If the inspections reveal prices that are too high, the caterer will be notified. If there is no improvement, this problem will be considered when the contract is up for renewal.
- (3)The caterers should hold promotional activities for the teachers and students from time to time. This factor will be considered when the contract is up for renewal.
- (4)The prices of different dishes are determined by the food management committee and the management team after discussions.
- (5)The prices of every dish should be engraved on acrylic plates and shown clearly for calculation by students and teachers to prevent misunderstandings.
- (6)Any adjustment of the prices (including adjustments caused by natural disasters or fluctuations in the price index) must be discussed and approved by the management team and food management committee before implementation.

References:

Annex 2.3.4A - Student Catering Venue Rental Contract

Annex 2.3.4B - NCUE Management Measures for School Cafeterias

Regulations Announcement Website:

<https://health.ncue.edu.tw/files/15-1018-9785,c1227-1.php?Lang=zh-tw>

For details on the occasional discounts at the student cafeterias, please refer to this website:

https://apss.ncue.edu.tw/odedi/doc_page.php?id=/.3.5-551../11

2. Cafeteria satisfaction survey

To ensure that NCUE's facilities offer healthy and reasonably priced meals for everyone on campus, NCUE invites faculty members, staff, and students to participate in a satisfaction survey on the cafeterias every academic year. The satisfaction survey helps the cafeterias renew their menus, improve their meals, optimize the cafeteria's hygiene, and implement necessary improvements. The survey results led to NCUE opening a convenience store on the Baoshan campus in 2021, giving teachers and students easy access to food and basic needs. The tendering process for the catering service at the tenth student residence hall on the Baoshan campus has been already completed (As shown in Figure 1). The new cafeteria should open officially by the second half of 2023, thus improving students' satisfaction with their catering experiences on the Baoshan campus.



Figure 1. Convenience Store on Baoshun Campus

Annex 2.3.4C - The Satisfaction Survey on NCUE School Cafeterias. For more details, visit the following website:

https://apss.ncue.edu.tw/odedi/doc_page.php?id=./4006./012-43

<https://aps.ncue.edu.tw/odedi/attch/M30/12/1206120301.pdf>

3. In response to the post COVID-19, the school cafeterias have implemented the following epidemic prevention measures:

- (1) NCUE formulated the Regulations for Self-management of Cafeteria Staff in response to the COVID-19. Under these regulations, NCUE monitors catering staff's daily health status. All staff members who have a fever or become ill must take time off and cannot return to work until they recover fully.
- (2) Thoroughly wash hands before meals, following the five steps: wet, rub, rinse, clean, and wipe. (Figure 2)
- (3) The cafeterias provide 75% alcohol disinfectant to diners at all times.



Figure 2. Wash Your Hands Before Eating.

4. The Ministry of Education (MOE) paid the "Annual Field Visit to Colleges and Universities and Student Dormitories for Pandemic Prevention and Preparation in the 110th Academic Year" to learn about the COVID-19 pandemic prevention measures and their implementations. In response, our institution shall adopt the most conscientious attitude and stringent regulations to prevent the pandemic outbreak across the campus. In addition to the implementation of staff management measures, such as TOCC surveys, admissions, health surveillance, notification and tracking of suspected symptoms, and counseling on living with the pandemic, we shall strengthen the cleaning and disinfection of public spaces such as restrooms, elevators, classrooms, libraries, cafeterias, and student dormitories. The visiting committee members appreciated our institution's pandemic prevention measures and commended the innovative pandemic prevention measures we introduced in the cafeteria. (Figures 3-4)



Figure 3. "Annual Field Visit to Colleges and Universities and Student Dormitories for Pandemic Prevention and Preparation in the 110th Academic Year"



Figure 4. Visiting members examining the innovative preventive measures introduced in our cafeteria

Annex 2.3.4D - Disease-Prevention Results

SDG 2.4.1 Indicator: Proportion of graduates in agriculture and aquaculture

Number of graduates

The number of students graduating from NCUE in 2021-2022: 1,126 in the bachelor's degree, 821 in the master's degree, 69 in the doctoral degree, and a total of 2,016. Please refer to Figure 1.

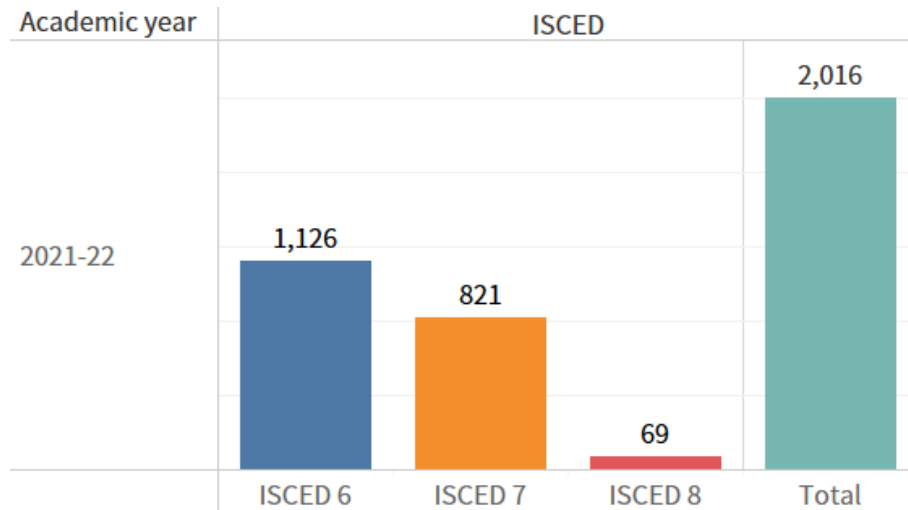


Figure 1. Number of students who graduated

Number of graduates from agriculture and aquaculture courses including sustainability aspects

There were 63 students working towards Bachelor of Science in Biology degrees 42 and Master of Science in Biology degrees 21 who graduated from the agriculture and aquaculture courses in the Department of Biology. Please refer to Figure 2 and Table 1 for details.

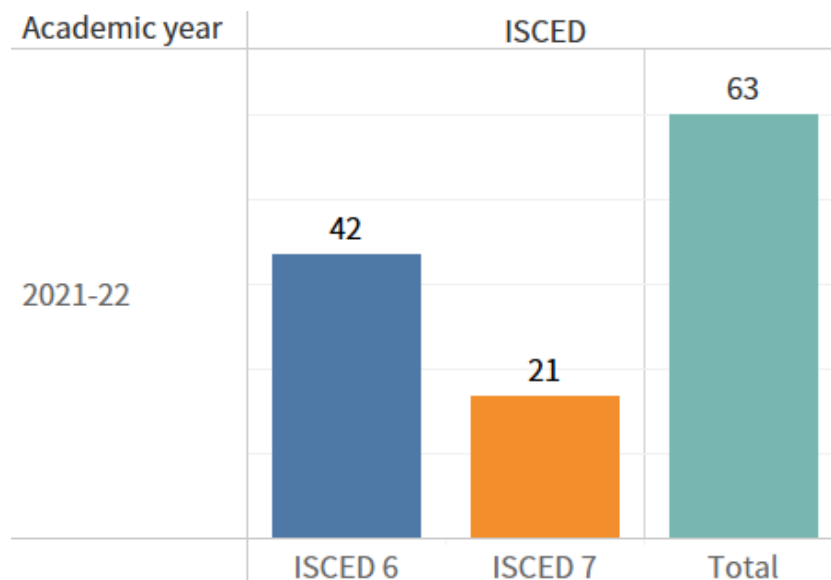


Figure 2. Number of students who graduated from the agriculture and aquaculture courses in the Department of Biology

Table 1. Number of students who graduated from the agriculture and aquaculture courses in various degree programs of the Department of Biology

1. The number of graduates according to the 6th edition (undergraduate level) of the <i>International Standard Classification of Education (ISCED)</i>	1,126 bachelor's degree graduates in 2021–2022
2. The number of graduates according to the 7th edition (graduate level) of the <i>International Standard Classification of Education (ISCED)</i>	821 master's degree graduates in 2021–2022
3. The number of graduates according to the 8th edition (doctoral level) of the <i>International Standard Classification of Education (ISCED)</i>	69 doctoral degree graduates in 2021–2022
4. The number of agricultural course (including sustainability) graduates according to the 6th edition (undergraduate level) of the <i>International Standard Classification of Education (ISCED)</i>	63 graduates: 42 Bachelor of Science in Biology graduates and 21 Master of Science in Biology graduates
5. The number of agricultural course (including sustainable development) graduates according to the 6th edition (undergraduate) of the <i>International Standard Classification of Education (ISCED)</i>	42 Bachelor of Science in Biology graduates
6. The number of agricultural course (including sustainability) graduates according to the 7th edition (including graduate level) of the <i>International Standard Classification of Education (ISCED)</i>	21 Master of Science in Biology graduates

SDG 2.5.1 Access to food security knowledge

NCUE's professional teams formed of experts in food security and sustainable agriculture, and aquaculture skills or technologies, along with the research team of the Department of Biology and the Environmental Education Centre, have spared no effort in providing local farmers and food producers with knowledge and skills relating to food security, sustainable agriculture, and aquaculture technologies, working together to develop a sustainable food industry and environment.

1. NCUE's research team from the Department of Biology helps the Ministry of the Interior promote and explain the wetlands grading system.

The team helped modify the system's application procedures. They also worked to enhance product values in an environmentally friendly manner and contributed to helping Mr. Ming-Liao Chen, a fisherman from Fangyuan Township, who applied for the first wetlands grading certification for a coastal fish farm in Taiwan, received the certification on 26 July 2021. Please refer to Figure 1.



Figure 1. Mr. Ming-Liao Chen has the first wetlands grading certification for a coastal fish farm in Taiwan

2. Deep Cultivation in Fangyuan and Joining Hands in Dacheng: Changhua Twin Cities' Industrial and Environmental Sustainability 2021.

(1) This was a budding project that offered the Aquaculture Product Testing and Environmental Management course to nurture the technical talent needed by local industries. Course attendees, including members of the Changhua County Aquaculture and Fisheries Development Association, also learnt about and experienced high-end detection technologies such as

aquaculture environmental inspection and management, care and inspection of aquaculture species, basic principles of aquatic processing and manufacturing technology, and aquatic product inspection technology. (Figure 2)

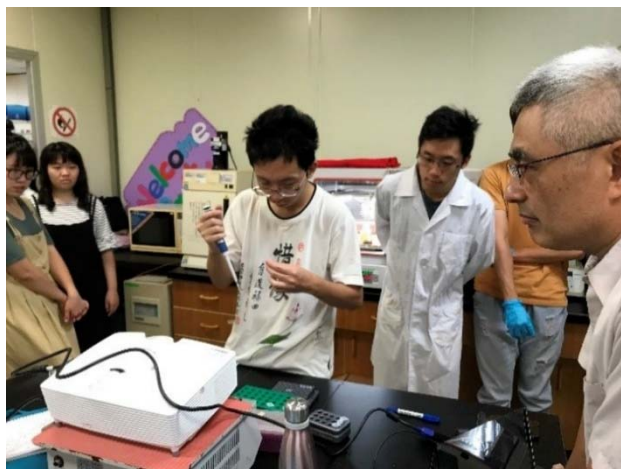


Figure 2. Professor Chuan-Fu Keng from the Department of Biology instructing students in fish bacterial infection quantitative detection techniques at the Free Radical Laboratory of the Graduate Institute of Biotechnology, NCUE on October 30, 2021

(2) NCUE's cross-disciplinary professional teachers and teachers of environmental education work together with scholars from other schools and local groups to promote the sustainable development of the industries and the environment in Changhua's twin cities, Fangyuan and Dacheng.

Environmental education gives local people have a clearer understanding and better awareness of the environment, motivating them to work with NCUE's Environmental Education Centre as it sets up environmental education certification courses and certification training classes, nurtures seeded teachers for local environmental education, addresses the local environmental issues, and strives for sustainable environmental development. The programs promoted in this project include research and practical experience in environmental education, an introduction to ecological and environmental protections, air pollution education, beach cleaning, wetlands conservation, energy saving, carbon reduction, green energy, and environmentally friendly product packaging and marketing. The projects focus on solving local environmental problems and developing the aquaculture industry. Please refer to Figure 3.

NCUE's professional and cross-disciplinary teams work with the Fangyuan and Dacheng Townships to maintain the beauty of their coasts and the important wetlands ecology, protect the aquaculture production of Asian hard clams and other clams, and reduce environmental pollution and the damage that it causes to the aquaculture industry.



Figure 3: May 25, 2022 Students and the aquaculture industry workers discussing the water quality testing values and their relationships with the environment, and discussing the measures to improve water quality

3. NCUE hosts at least ten lectures, activities, or workshops every year to improve food and agriculture education; to promote responsible fish consumption; to improve the aquaculture environment and safety technologies of aquatic food; to promote public health, environment, and food safety; to control the quality of agriculture and fishery products; and to enhance the ethical behavior and the quality of environmental conservation within the industries. (Figure 4)



Figure 4. In September 2021, the course for environmental education staff

References:

Annex 2.5.1A - Achievements of the Ministry of Education and NCUE's Deep Cultivation in Fangyuan and Joining Hands in Dacheng: Changhua Twin Cities' Industrial and Environmental Sustainability Project

For more information, visit this website: <https://www.facebook.com/NCUEUSR/>

SDG 2.5.2 Events for local farmers and food producers

NCUE organises courses and activities for local farmers and food producers to enhance communication and share knowledge about agricultural products and food production. NCUE also proposes projects and holds campus celebrations so local farmers and food producers can promote local agricultural products in bazaars. The events enable teachers, students, and residents to gain in-depth understanding of local agricultural products and interact professional, such as fisheries education courses. Please refer to Figure 1.



Figure 1. May 21, 2022 The fish-eating education course. Attendees learned to understand the relationship between friendly farming fishery and environmental sustainability, and experienced local farming of fish to make aquatic food

1. Vegetarian Food Exhibition on Campus Organized by Bliss & Wisdom Youth Club

Through various activities such as challenges, Bliss & Wisdom Youth Club offered vegetarian burgers and informative lectures. This allows faculty members and students who participated to develop a sound understanding of proper dietary concepts, embrace diets that are beneficial to the general public, gain insights into the impact of meat-based diets on global rainforests, ecological environments, and the planet as a whole. Furthermore, these activities inspire participants to care for life and take practical actions to create a sustainable environment for humanity. Please refer to Figure 2 for event photos. Event Website: https://www.facebook.com/ncuebwy/?locale=zh_TW.



Figure 2. General lecture on campus vegetarian food exhibition on October 19, 2022.

2. General Education Lecture Organized by the Student Association – Building a Green and Environmentally Friendly Earth Through Diet.

NCUE holds general education lecture to advocate for ideas such as a nutritious vegetarian diet and reduced plastic usage within the campus community, disseminating accurate dietary insights and healthy lifestyle practices to all members of the school, cultivating genuine care for people and the environment, and nurturing a sense of appreciation for our daily sustenance. Please refer to Figure 3 for event photos.



Figure 3. 2022 Student Union General Lecture Course: Building a Green and Sustainable Earth Through Diet

3. Through the required general education course “Exploration, Development, and Practice of Life”, NCUE collaborated with a food bank to organize volunteer activities. Students were guided through the activities, which included providing explanations about the importance of food and related knowledge. The volunteer activities encompassed the repackaging of supplies, enabling

students to empathize with the feelings experienced by disadvantaged children upon receiving gifts. This fosters a sense of social responsibility among students, encourages contemplation regarding Earth's ecological progress, and deepens their comprehension of the significance of Environmental, Social, and Governance (ESG) principles in shaping humanity's future.

(1) On March 20, 2023, 35 faculty members and students led by the Department of Finance participated in the volunteer activity at the Andrew Charity Association. Please refer to Figure 4 for event photos. Event Website: <https://reurl.cc/ZWzXzl>.



Figure 4. March 20, 2023, General Education course, assisting in food distribution and packaging, understanding the importance of food

(2) On May 9, 2023, 17 students led by the Department of Fine Arts participated in the volunteer activity at the Andrew Charity Association. Please refer to Figure 5 for event photos.



Figure 5. May 9, 2023, General Education course, participating in actual material packaging, guiding students to contemplate the importance of service learning

SDG 2.5.3 University access to local farmers and food producers

NCUE has long shared its professional facilities, technology, and service plans with local farmers and food producers, helping them with industrial upgrades and sustainable development by providing professional knowledge and technical support.

1. NCUE's Department of Biology offers access to well-planned research rooms and supporting projects.

Local farmers and food producers hoping to improve their sustainable farming practices benefit from the NCUE Department of Biology's research projects in such areas as the symbiosis between insects and microorganisms, algae engineering, social insects, animal ecology and evolutionary biology, yeast biodiversity and ecological evolution, bionics, molecular neuroendocrinology, molecular biology, plant genetic engineering, molecular health sciences, molecular medicine, free radical biology and biotechnology, bioinformatics, biology teacher training, environmental education, multimedia biology teaching and learning, and brain function and learning. The Department's teaching and research results have contributed enormously to agricultural improvements.

2. NCUE's Department of Geography promotes planning and research on regional development.

The proper regional planning promotes the region's overall development, environmental conservation, and environmental assessments and improves farmers' living environment and production.

3. NCUE implemented the project Deep Cultivation in Fangyuan and Joining Hands in Dacheng: Changhua Twin Cities' Industrial and Environmental Sustainability 2021.

NCUE implemented the Ministry of Education's budding project Deep Cultivation in Fangyuan and Joining Hands in Dacheng: Changhua Twin Cities' Industrial and Environmental Sustainability 2021 by opening its water quality analysis laboratory, molecular health sciences laboratory, and molecular neuroendocrinology laboratory. This helped fish farmers in Changhua perform identification and quantitative detections on water quality, aquatic product safety and sanitation, white spot syndrome in shrimp, and fish diseases. (Figure 1)



Figure 1. On March 16, 2022, a golden clam farmer brought the aquaculture pond's water and subsoil to the lab in the Department of Biology.

4. NCUE formed a water quality inspection and monitoring service team to implement a service plan.

In 2020, 18 teachers and students from NCUE formed a water quality inspection and monitoring service team that cooperated with the Fisheries Research Institute and Hungkuang University to provide technical support to the Changhua County Aquaculture Association. The team monitored and inspected the county's 14 fish farms, four coastal inlets, and numerous groundwater wells twice monthly, providing real-time detection and monitoring analyses on water quality and bacteria levels to improve and enhance the quality and safety of coastal aquaculture and food systems with technical support. Please refer to Figure 2 for the course activities.



Figure 2. My Low Carbon and Energy Saving Daily Routine Course on April 13, 2022

References:

Visit this website for the latest research conducted by NCUE's Department of Biology:

<http://biology.ncue.edu.tw/front/Academic%20Achievements/journal.php?ID=bmN1ZV9iaW9sb2d5JkFjYWRIbWljIEFjaGlldmVtZW50cw>

Visit the NCUE Department of Biology website here: <http://biology.ncue.edu.tw/>

Visit the NCUE Department of Geography website here:

https://geo3w.ncue.edu.tw/intro_021.php

For more about Ministry of Education's project Deep Cultivation in Fangyuan and Joining Hands in Dacheng: Changhua Twin Cities' Industrial and Environmental Sustainability Project, visit this website: <https://www.facebook.com/NCUEUSR/>

SDG 2.5.4 Sustainable food purchases

NCUE has always given priority to purchasing products from local, sustainable sources. For example, the cafeterias preferentially purchase seasonal and local products to reduce long-distance transport's food miles and carbon emissions. Purchasing locally also stimulates local consumption and ensures ingredient control so cafeteria diners can feel at ease knowing that their food is fresh, safe, and healthy. Please refer to Figure 1 for the annual inspection by the Ministry of Education. The relevant implementation strategies are as follows:



Figure 1: The Ministry of Education Annual conducts on-site guidance on catering and hygiene.

1. NCUE upholds two basic principles when purchasing ingredients:

- (1) Giving priority to seasonal ingredients.
- (2) Giving priority to local ingredients, which supports local produces and reduces the ingredients' carbon footprint by shortening the food miles to reduce energy consumption.

2. Following a three-level management mechanism for campus food safety and hygiene, NCUE cooperates with the Ministry of Education to conduct on-site guidance every academic year. NCUE's food management committee handles cross-department coordination with the Ministry of Education, appointing nurses to serve as hygiene supervisors who inspect the catering places weekly.

3. NCUE encourages the school cafeterias maintain tight control over the ingredients through the following:

- (1) Give priority to labeled, traceable ingredients, including traceable agricultural products (TAP) and agricultural products with Taiwan's Certified Agricultural Standards (CAS) labels or agricultural (livestock, aquatic) production traceability QR codes. Please refer to Figure 2.



Figure 2. Using local eggs as ingredients

- (2) Test the ingredients used in the cafeterias, following the guidelines on the monitoring website for pesticide residues in agricultural products. The Food and Drug Administration, Ministry of Health and Welfare, offers this public website to help ensure the safety of fresh fruits and vegetables.
- (3) Under NCUE's supervision, disclose the ingredient information daily on the Ministry of Education's ingredient source database for campuses.

References:

Annex 2.5.4A - Sustainable Food Purchases; please refer to the Minutes of the Food Management Committee for semester one of the 2022 academic year:

https://aps.ncue.edu.tw/odedi/doc_page.php?id=504/./.-62/

For the monitoring website for pesticide residue in agricultural products, visit this website:

<https://www.fda.gov.tw/TC/site.aspx?sid=2428&r=1485767145>

For the Ministry of Education's ingredient source database for campuses, visit this website:

<https://fatraceschool.k12ea.gov.tw/frontend/>