



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 has measured and managed the daily food waste of the two school cafeterias. The statistics showed that the average daily food waste generated by the two school cafeterias in 2023 was lower than 0.021 tons. Compared to 2022, the daily average food waste generation at NCUE has decreased by 0.001 tons. 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
2023	0.021 tons	0.001 tons
2022	0.022 tons	0.003 tons
2021	0.025 tons	-

Note: The calculation formula is based on the year 2023. Daily Average Food Waste Generation = Annual Food Waste/Total Working Days in a Year (5 days a week × 52 weeks). 5.5 tons/260 days = 5,500 kilograms/260 days = 21 kilograms per day = 0.021 tons

2. NCUE has implemented a food waste reduction policy.

(1) NCUE's food waste reduction policies are as follows:

- (a) Promoting nutrition education and food appreciation and encouraging students to take only what they can eat, not to pick at food, and not to 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 near-expired food promotional offers to reduce leftovers. For details on the school cafeteria's promotional measures, please refer to Annex 2.2.1A.

(2) As part of NCUE's food waste reduction policies, the two school cafeterias classify the daily food waste generated with food waste bins placed in both school cafeterias. Specially appointed janitors 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) To efficiently utilize ingredients, NCUE has implemented a standardized meal preparation process and reduced the portion size of each meal. This ensures that teachers and students can finish their meals completely, avoiding food waste. (Figure 1)



Figure 1: Delicious and healthy small-portion meals in the school cafeteria

(b) NCUE has regulated the selection, purchase, and management of ingredients to ensure that vendors' procurement, processing, and inventory follow standardized procedures. Vendors closely monitor the inventory and freshness of all kinds of food to ensure safe and effective use of ingredients. Near-expired foods are made into discounted lunch boxes to promote sales, to reduce waste, and to ensure food safety. The cafeterias' effective use of ingredients enables teachers and students to enjoy nutritious food at low prices, reducing their financial burden and food waste.

Annex:

Please refer to Annex 2.2.1A for details on School Cafeteria Discount Measures.

SDG 2.2.2 Campus food waste

Total food waste

- The total food waste generated by the school cafeterias at both of NCUE’s campuses in 2023 was 5.5 tons and the average daily food waste per faculty members and students was 2.75 grams. Compared to the 5.72 tons of food waste generated in 2022, which resulted in an average daily food waste per faculty members and students of 2.75 grams, this reduction of 0.15 grams indicated a notable improvement in our efforts of food waste reduction. Please refer to Table 1.

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

Year	Annual food waste volume	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
2023	5.5tons	2.60 grams	0.15 grams
2022	5.72 tons	2.75 grams	0.41 grams
2021	6.5 tons	3.16 grams	-

Note: The calculation formula is based on the year 2023.

- Daily average food waste generation = Annual food waste/Number of working days in a Year (5 working days per week * 52 weeks = 260 days): 5.5 tons/260 days = 0.021 tons (21,000 grams).
 - Average food waste per faculty member and student = Daily food waste/Total number of faculty members and students in the school (7,240 students + 821 faculty members =8,061 people): 21,000 grams/8,061 people = 2.6 grams.
- NCUE abides by the United Nations’ principle of avoiding food waste, encouraging teachers and students to “purchase food that you can finish but not more.” NCUE supports the cafeterias to purchase ingredients from local farmers. This allows them to make the freshest, most delicious meals while also reducing the carbon footprints generated by transporting the ingredients. (Figure1)



Figure 1: Buffet-style meals made by our school cafeterias with local ingredients

Campus population

The campus population is 8,051, with 7,240 students in day-time courses and 811 staff members.

1. A total of 7,240 students: 5,044 in bachelor’s programs; 1,721 in master's programs; 475 in doctoral programs. For campus population, please refer to Figure 2.

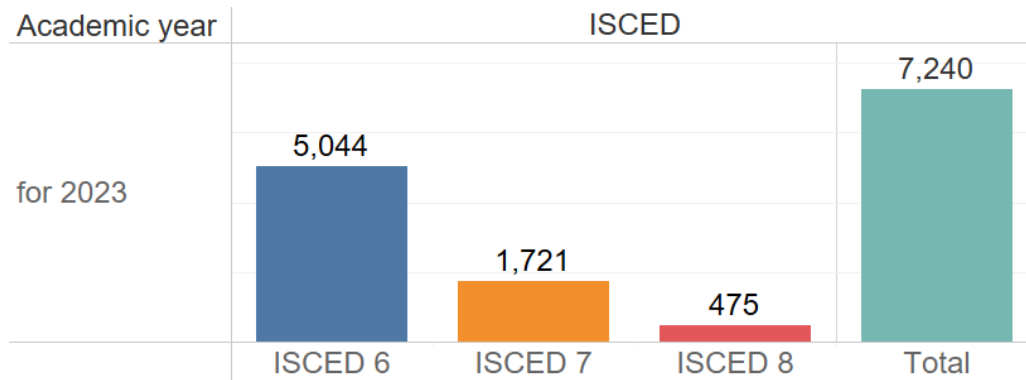


Figure 2: Campus Population

2. A total of 811 staff members: 365 teachers, 85 staff members, 6 technicians, 215 employees in the school fund, and 140 project assistants in the program. For faculty numbers, please refer to Figure 3.

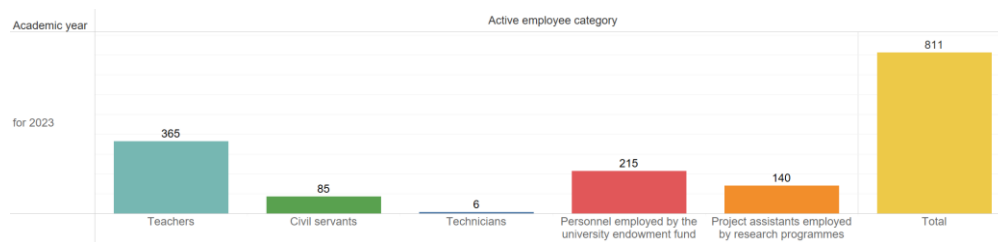


Figure 3: Faculty Numbers

SDG 2.3.1 Student food insecurity and hunger

Adhering to a three-tier management system 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 strives to support students' well-being by reducing 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 satisfaction survey 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	Numbers of Food Hygiene Supervision	Incidents of Food Poisoning
2020	32	0
2021	26	0
2022	34	0
2023	52	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).



Figure1 : 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 Incident Policy, offering 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 incidents happen and solve the problems quickly.
 - (c) Registration of food ingredients: 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:

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

2. NCUE has adopted following 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 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 and healthy foods: the dining tables show suggestions for mixing different food types; wall posters and TV screens offer nutrition information and health education guidelines. NCUE also invites nutritionists to share healthy diet tips with students and faculty and hold fun activities such as garden parties with 'vegetable battles' to convey dietary health knowledge (Figure2).



Figure 2: 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 hunger interventions

1. NCUE offers **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 hunger problems. Therefore, NCUE stipulates Jin-Pyng Wang Emergency Bursary and Meal Coupons for Students under the 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 Figure1. These **free** meal coupons have been available since 2009, and in recent years, hundreds of students have applied for them. In 2023, 152 students received **free** meal coupons at a cost to NCUE of only 545,350 NTD. Please refer to Annex 2.3.2B



Figure 1: NCUE's **free** meal coupons

Annexes:

Annex 2.3.2A Key Points for Applying **Free** Meal Coupons.

Annex 2.3.2B Summary Table of Meal Coupon Users.

Annex 2.3.2C Photos of student food safety strategies.

Meal Voucher Application Announcement Webpage: <https://stuaffweb.ncue.edu.tw/p/412-1039-1344.php>

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) NCUE has installed multi-function vending machines that offer instant noodles, bread, and beverages (as shown in Figure 2) at various locations throughout the campus and dormitory areas. These machines are designed to meet students' dietary needs outside of regular cafeteria service hours.



Figure 2: 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 students. That campus also has a comfortable, creatively decorated café (As shown in Figure3 and Figure4) where teachers and students can enjoy coffee and relax.

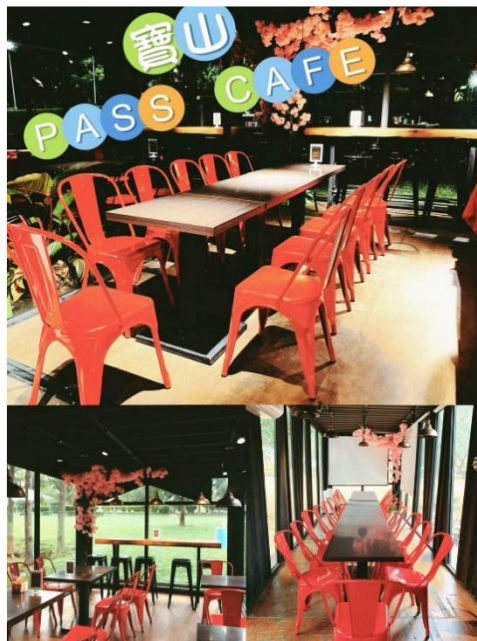


Figure3: Creative Cafeteria on Baoshan Campus



Figure4: Creative Cafeteria on Baoshan Campus

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-based 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 (Figure1).

For reference on the diverse dining services offered by our school cafeteria, please visit: https://apss.ncue.edu.tw/odedi/doc_page.php?id=51414346/.03



Figure 1: Diverse dining services offered by the 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. Through counseling visits to campus restaurants by the Ministry of Education and corporate bodies, NCUE can provide healthier catering services to all teachers and students in the school

Annex:

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 safe, 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.

Annexes:

Annex 2.3.4A Student Catering Venue Rental Contract.

Annex 2.3.4B NCUE Management Measures for School Cafeterias.

Regulations Announcement Website: <https://healthweb.ncue.edu.tw/p/404-1041-24833.php>

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=51301//44/2

2. Cafeteria satisfaction survey

To ensure that NCUE's cafeterias 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). Furthermore, the school cafeteria in Dormitory No. 10 at the Baoshan Campus

opened in September 2023, which is expected to enhance the dining satisfaction of students at the Baoshan Campus.



Figure 1: Convenience Store on Baoshun Campus

Annexes:

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).



Figure 2: Wash Your Hands Before Eating.

(3) The cafeterias provide 75% Ethyl Alcohol to diners at all times.

4. The Ministry of Education paid the "Annual Field Visit to Colleges and Universities and Student Dormitories for Pandemic Prevention and Preparation in the 2021 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 2021 Academic Year"



Figure 4: Visiting members examined the innovative preventive measures in our cafeteria

Annex:

Annex 2.3.4D Disease-Prevention Results.

SDG 2.3.5 Staff hunger interventions

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

1. 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 staff (Figure 1).



Figure 1: School cafeteria on Baoshan Campus

2. Multi-functional vending machines that offer instant noodles, bread, and beverages are installed at various locations across the campus (as shown in Figure2) to meet the dietary needs of faculty and staff during times when the cafeteria is not in service.



Figure 2: Vending machines on campus

3. 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 3) where staff can enjoy coffee and relax.

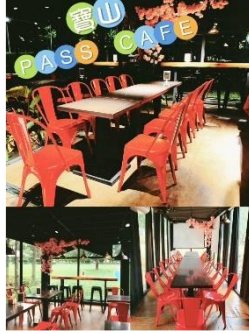


Figure 3: Creative Cafeteria on Baoshan Campus (Interior Dining Area)



The Creative Cafe on the Baoshan.

Figure 4: Creative Cafeteria on Baoshan Campus (Exterior Landscape)

School Cafeteria Introduction Webpage: <https://lib2.ncue.edu.tw/files/15-1035-22109,c3439-1.php?Lang=zh-tw>

SDG 2.4.1 Proportion of graduates in agriculture and aquaculture

Number of graduates

The number of students graduating from NCUE in 2022-2023: 1,145 in the bachelor's degree, 823 in the master's degree, 63 in the doctoral degree, and a total of 2,031. Please refer to Figure 1.

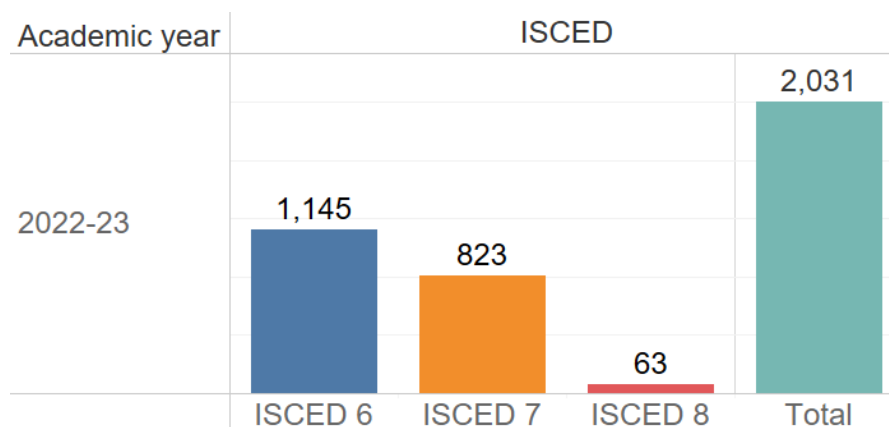


Figure 1: Numbers of students who graduated

Number of graduates from agriculture and aquaculture courses including sustainability aspects

There were 63 students working towards Bachelor of Science in Biology degrees 40 and Master of Science in Biology degrees 23 who graduated from the agriculture and aquaculture courses in the Department of Biology. Please refer to Figure 2 and Table 1 for details.

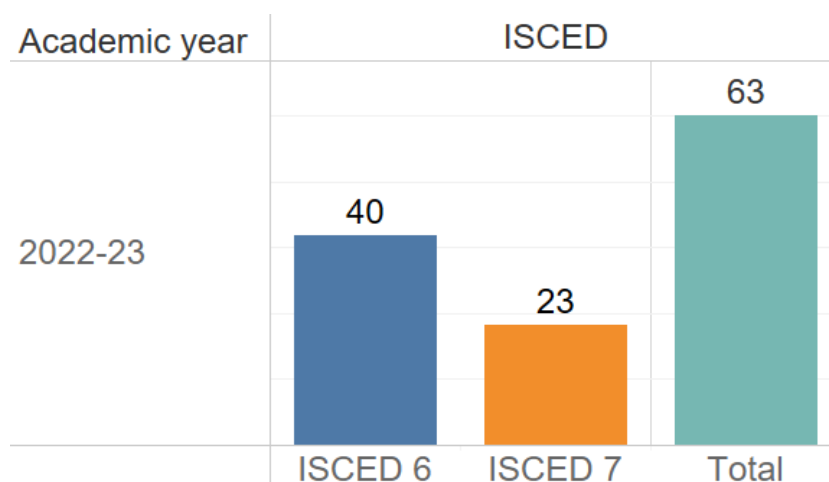


Figure 2: Numbers of students who graduated from the agriculture and aquaculture courses in the Department of Biology

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

ISCED	Number of graduates
1. The number of graduates according to the 6th edition (undergraduate level) of the <i>International Standard Classification of Education (ISCED)</i>	1,145 bachelor's degree graduates in 2022–2023
2. The number of graduates according to the 7th edition (graduate level) of the <i>International Standard Classification of Education (ISCED)</i>	823 master's degree graduates in 2022–2023
3. The number of graduates according to the 8th edition (doctoral level) of the <i>International Standard Classification of Education (ISCED)</i>	63 doctoral degree graduates in 2022–2023
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: 40 Bachelor of Science in Biology graduates and 23 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>	40 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>	23 Master of Science in Biology graduates

SDG 2.5.1 Access to food security knowledge

NCUE's professional teams consist 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. The professional teams of NCUE 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 with locals to develop a sustainable food industry and environment.

1. The USR (University Social Responsibility) project, conducted by NCUE's Department of Biology and Center for Environmental Education, assisted Mr. Chen Ming-Liao, a local fisherman from Fangyuan, in obtaining Taiwan's first Wetland Label certification for his aquaculture fishpond in 2021. Subsequently, USR assisted Fangyuan Community Development Association in establishing the "Changhua Marine Food Research Base" in 2022. In 2023, two Biology Department graduates, Wang Zhi-Sheng and Qiu Guan-Hua, who participated in USR, along with Zhao Jun-Jie, a local youth from the Center for Environmental Education's certified training program, collaborated with local community and Mr. Chen Ming-Liao. Together, they established a new model of community cooperation and sustainable seafood education. By leveraging local ecological features, aquaculture, and cultural resources, they revitalized the industry. They promoted marine and conservation education, integrating low-carbon seafood consumption with ecological education. Through **free** practical experiential courses, they guided students in understanding and conserving the economic and ecological resources of Changhua's coastal areas. Please refer to Figure 1.



Figure1: The Integrated Communications Department of Common Wealth Magazine planned and produced a news story on July 11, 2023, titled: "Cross-generational Collaboration Illuminates Local Communities! Changhua Marine Food Research Base Discovers a New Model of 'People x Economy' for Hometown Prosperity."

2. The Changhua Twin Cities' Industrial and Environmental Sustainability Emerging USR Project offers the "Aquaculture Product Testing and Environmental Management" course. The course was initially designed to cultivate skilled personnel to meet needs of local industry and to enhance the technical literacy of members of the Changhua Aquaculture Development Association in aquaculture environmental testing and management. In 2023, the course expanded to include

aquacultural professionals with outstanding achievements as instructors. This allowed students to enter the production and sales environments of seafood products such as Asian hard clams, Corbicula clams, and white shrimp. Students could experience and learned knowledges and techniques related to aquaculture, food processing techniques and safety control, import/export procedures, and marketing strategies. This hands-on approach enabled students to witness advanced technologies, management practices, and marketing methods firsthand. They also gained an understanding of the growing global demand for safe, low-carbon aquatic food products. Throughout this course, students may cooperate with local fishing villages and communities, striving for a more stable and secure supply of aquatic food products in the future. Please refer to Figure 2 and Figure 3 for visual reference.



Figure 2: Faculty and students visited Tongli Aquatic Products to learn about the aquaculture technique of Asian hard clams and Corbicula clams. They gained insight into the process of packing refrigerated containers for exporting to Japan, experienced biotechnology products and various processed goods, and learned how to refine techniques. This visit might enhance their competitiveness and help them establish a reputation in the international market in the future



Figure 3. Changhua Sheng Yi Aquatic Products is the first company in Taiwan to obtain organic product certification for four items: Asian hard clams, white shrimp, milkfish, and black clams. The owner, Yang Yi-Hua, is one of Taiwan's top 100 young farmers. Together with his brother, he returned to their hometown to jointly manage the brand "Ping Bao Ha" (Treasure Clams). Faculty and students learned how to breed high-quality, high-value aquaculture environments and food products. They also studied the development of biotechnology products to increase production value and competitiveness

3. 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.

(1) Environmental education make local people to 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.

(2) 2023 "University Social Responsibility Implementation Project: Beautiful and Treasured Clams in Fangyuan and Dacheng: Sustainable Industry and Environment Project of Changhua's Two Cities Amid Climate Change": This project builds upon the 2022 "Deep Cultivation in Fangyuan' and 'Joining Hands in Dacheng: Changhua Twin Cities' Industrial and Environmental Sustainability". In addition to providing the services of water quality survey for fishponds of the Changhua Aquaculture Association, coastal water inlets, and wells, the project has expanded its scope based on feedback from stakeholders of USR project. The project has expanded its services to support farms of golden clam and enlarged survey areas, such as the upper, middle, and lower reaches of rivers that serve as water sources for fishponds. This project is aimed to maintain and monitor the safety of water resources for aquaculture operators and coastal areas. All of the aforementioned services are provided **free of charge**. Please refer to Figure 4.



Figure 4: In June 2023, the water quality survey team from the Department of Biology at NCUE, as part of the USR project, conducted water quality investigations along the upper, middle, and lower reaches of rivers

4. NCUE hosts at least ten lectures, activities, or workshops every year for **free** 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 (See Figure 5 and Figure 6).



Figure 5: In March 2023, NCUE organized workshops where faculty, students, and aquaculture operators learned together. This workshop also promoted the use of beneficial bacteria for maintaining good quality of water and enhancing the quality of aquaculture product



Figure 6: In April 2023, the "Aquaculture and Greenhouse Gases" course was conducted. Participants included faculty, students, local aquaculture operators, and organizations. The course promoted environmentally friendly, low-carbon production strategies for the industry, aiming to collectively maintain the health and sustainability of local aquatic ecosystems

Annex:

Ministry of Education's project: "Beautiful and Treasured Clams in Fangyuan and Dacheng: Sustainable Industry and Environment Project of Changhua's Two Cities Amid Climate Change". For more information, visit this Project webpage: <https://www.facebook.com/NCUEUSR/>

SDG 2.5.2 Events for local farmers and food producers

NCUE organizes courses and activities for local farmers and food producers to enhance communication and share knowledges 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. Please refer to Figure 1 for the photo of the agriculture education booth. Event webpage:

<https://www.facebook.com/photo?fbid=747920040848094&set=pcb.747920224181409>



Figure 1: The photo of Changhua County Mayor Wang Hui-Mei (on the left), project partners and project staff - taken at the "Big Fun Youth Fair" (food and agriculture education booth) on April 27, 2024

1. The student club "Bliss and Wisdom Youth Society" organized a **free** vegetarian food exhibition (Event name: Organic Holiday).

The event promoted the benefits of organic practices, encouraging everyone to protect the environment and the planet. It helped participants understand the impact of meat-eating culture on rainforests, ecological environments, and the Earth as a whole. This awareness motivated faculty and students to care more about life and take practical actions to create a sustainable environment for humanity. Please refer to Figure 2 for event photos.



Figure 2: December 23, 2023: Vegetarian Food Exhibition (Event name: Organic Holiday)

2. The student club "Bliss and Wisdom Youth Society" organized a **free** seminar titled "Mindful Tea Ceremony - Awakening Ancient Souls with Organic Tea Fragrance": The event shared organic concepts through tea grown by farmers of organic tea. In addition to learning tea serving etiquette, participants also sampled organic vegetarian dishes prepared by the instructor of tea ceremony. Event webpage: https://www.facebook.com/photo/?fbid=719938026818115&set=a.447049867440267&locale=zh_TW



Figure 3: October 25, 2023, Event name: Mindful Tea Ceremony - Awakening Ancient Souls with Organic Tea Fragrance

3. NCUE, through its required general education course, "Life Exploration, Development, and Practice," collaborated with the Food Bank to organize **free** volunteer activities. These activities included guided tours that helped students understand the importance of food and related knowledge. The volunteer work involved repackaging supplies, encouraging students to empathize with the feelings of children from disadvantaged families receiving gifts. This experience enhanced students' social awareness on global ecological development, also highlighting the importance of corporate sustainable governance (ESG) for the future development of humanity as a whole.
- (1) On March 20, 2023, the Department of Finance and Technology led a group of 35 faculty members and students to participate in a volunteer activity at the Andrew Charity Association. Please refer to Figure 4 for photos of the event. Event Website: <https://www.facebook.com/100064817136270/posts/pfbid08G2SHcoKhQ7LqFwLvrqUiG4ncrmHJmLr4puhZzPZpeK19YYqFhPo1uBvp2KWBvHUI/?mibextid=Nif5oz>



Figure 4: March 20, 2023 assist with food distribution and packaging, gaining an understanding of the importance of food.

(2) On May 9, 2023, the Department of Fine Arts led a group of 17 faculty members and students to participate in a volunteer activity at the Andrew Charity Association. Please refer to Figure 5 for the photo of the event.



Figure 5: May 9, 2023 - Students engaged in supply packaging and being guided to reflect on 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 with local farmers and food producers, assisting them with professional knowledge and technical support that improves their business model and sustainable development.

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. The Department of Geography at NCUE has promoted the planning and research of regional development. Throughout well regional development plans that push ahead overall regional development and environmental conservation, the productivity and the living quality of farmers are improved.
3. The Ministry of Education's project: "Beautiful and Treasured Clams in Fangyuan and Dacheng: Sustainable Industry and Environment Project of Changhua's Two Cities Amid Climate Change" carried out by NCUE:

The project provided aquaculture operators access to various laboratories, including the Water Quality Analysis Laboratory, Molecular Health Laboratory, Free Radical Laboratory, and Molecular Neuroendocrine Laboratory without any charge. NCUE offered complimentary assistance to Changhua's aquaculture operators with the following services: water quality environmental analysis, aquatic product safety and hygiene testing, white spot disease detection in shrimp, fish disease identification, and quantitative testing. (Please refer to Figure 1)



Figure 1: August 23, 2023 - Bivalve Aquaculture Workshop cooperated with local operators

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 14 fish farms, four coastal inlets, and numerous groundwater wells in Changhua county twice monthly, providing real-time detection and monitoring analyses on water quality and bacteria levels to improve the quality and safety of coastal aquaculture and food systems with technical support. Please refer to Figure 2 for the photos of activities of the service team.



Figure 2: October 16, 2023 - Water Quality and Bacterial Detection Monitoring Workshop

Annexes:

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

<https://biology.ncue.edu.tw/front/Academic%20Achievements/journal.php?ID=bmN1ZV9iaW9sb2d5JkFjYWRLbWljIEFjaGlldmVtZW50cw==>

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

Visit the NCUE Department of Geography website here: https://geo3w.ncue.edu.tw/intro_021.php

The webpage of Ministry of Education's project: "Beautiful and Treasured Clams in Fangyuan and Dacheng: Sustainable Industry and Environment Project of Changhua's Two Cities Amid Climate Change": <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 implemented 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 principles:
 - (1) Give priority to labeled, traceable ingredients, such as 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) Disclose the ingredient information daily on the Ministry of Education's ingredient source database for campuses.

Annexes:

Minutes of the Food Management Committee for semester one of the 2023 academic year:

https://apss.ncue.edu.tw/odedi/doc_page.php?id=51/65-5-1140

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/>