



# ASSESSMENT

SUPPORT AND DEVELOPMENT OF EDUCATIONAL PROGRAMMES IN THE FIELD OF AGRICULTURE AT GENERAL AND TECHNICAL HIGH SCHOOLS (GTHS) IN CAMBODIA

## REPORT

18 NOVEMBER 2022

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Assessment Report

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# ACRONYMS

<b>ACTIVE for Youth</b>	Agro-processing Career Development, Technical Training, and Improved Vocational Education for Youth
<b>ASPIRE</b>	Agricultural Services Programme for Innovations, Resilience, and Extension
<b>CAA</b>	Cambodia Aquaculturist Association
<b>CaP FISH</b>	The Cambodia Programme for Sustainable and Inclusive Growth in the Fisheries Sector
<b>CAST</b>	Commercialization of Aquaculture for Sustainable Trade
<b>CDA</b>	Czech Development Agency
<b>EU</b>	European Union
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit
<b>GTHS</b>	General and Technical High Schools
<b>IFAD</b>	International Fund for Agricultural Development
<b>HEI</b>	Higher Education Institution
<b>HEIP</b>	Higher Education Improvement Project
<b>KII</b>	Key Informant Interview
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MoEYS</b>	Ministry of Education, Youth, and Sports
<b>NVIB</b>	National Vocation Institute of Battambang
<b>PESD</b>	Partnership for Employment and Skills Development
<b>PIN</b>	People in Need
<b>PPPs</b>	Public-Private Partnerships
<b>RUA</b>	Royal University of Agriculture
<b>SPF</b>	Strategic Planning Framework
<b>SPS</b>	Sanitary and Phytosanitary
<b>STEM</b>	Science, Technology, Engineering, and Mathematics
<b>ToR</b>	Terms of Reference
<b>TSL</b>	Tonle Sap Lake
<b>TVET</b>	Technical and Vocational Education and Training
<b>UN</b>	United Nations
<b>VOD</b>	Vocational Orientation Department
<b>WASH</b>	Water, Sanitation, and Hygiene
<b>WCS</b>	Wildlife Conservation Society

# INTRODUCTION

## BACKGROUND

**Assessment.** The Czech Development Agency (CZDA) through the Embassy in Phnom Penh commissioned this assessment to explore the possibilities of strengthening aquaculture in the General Technical High Schools (GTHS). As per the Terms of Reference (ToR), there were three assessment components, namely, current interventions, opportunities, and GTHS overview. These areas were outlined in more detail:

1. Brief description of other donor's larger intervention in the aquaculture value chain in Tonle Sap region (e.g., CaP Fish, CAST) and its TVET components
2. In cooperation with Vocational Orientation Department (VOD) identify possible localization of a new/existing GTHS with agriculture programmes to pilot newly developed aquaculture modules (especially Agro/food processing and Animal Husbandry) in Tonle Sap region
3. Based on desk research and in cooperation with VOD at the Ministry of Education, Youth and Sport (MoEYS) provide data on the number of students in the 3 agriculture programmes at GTHSs nationwide.

**Cambodia.** Cambodia is one of the poorest and least developed Southeast Asian countries with human development indicators that place it in the lower middle-income category.<sup>1</sup> Based on the latest United Nations data, Cambodia's current population is estimated at 17,268,115.<sup>2</sup> The rural population is significantly larger than the urban population (75.8% to 24.2%). Only just over one-third of the population lives slightly above the poverty line.<sup>3</sup> The standard of living is substantially lower in rural areas. Cambodians face problems in accessing quality education, healthcare, drinking water, waste management services, and land. Despite the economic growth and performance over the last two decades, the need for external assistance remains high.

**Activities of the CZDA.** Cambodia was a project priority country for the Czech foreign development cooperation until 2017, where the project focused mainly on problems in healthcare, education, and renewable energy in the less developed parts of the country.<sup>4</sup> The current cooperation program for the period 2018-2023 builds on this previous work and emphasizes sustainable management of natural resources and inclusive social development. This cooperation responds to the objectives of the Development Cooperation Strategy of the Czech Republic 2018-2030 and is aligned with the Sustainable Development Goals (SDGs) under the 2030 Agenda for Sustainable Development and the Global Partnership for Effective Development Cooperation.<sup>5</sup> Projects include improving drinking water supply, sanitation, water protection, waste management, and healthcare. In education, activities will "focus mainly on ensuring affordable, high-quality and inclusive vocational, apprenticeship and higher education, including university education."<sup>6</sup> This programme lays the groundwork for coordinated and consolidated Czech development cooperation with Cambodia to promote sustainability, coherence, and visibility.

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<sup>1</sup> Ministry of Foreign Affairs of the Czech Republic. Bilateral Development Cooperation Programme of the Czech Republic Cambodia 2018–2023. [http://www.czechaid.cz/wp-content/uploads/2018/03/Programme\\_Cambodia\\_CzechAid\\_2018\\_EN.pdf](http://www.czechaid.cz/wp-content/uploads/2018/03/Programme_Cambodia_CzechAid_2018_EN.pdf)

<sup>2</sup> Worldometers. 22 Nov 2022. Cambodia Population. <https://www.worldometers.info/world-population/cambodia-population/>

<sup>3</sup> CZDA. Cambodia. Current situation. <http://www.czechaid.cz/en/zeme/cambodia/>

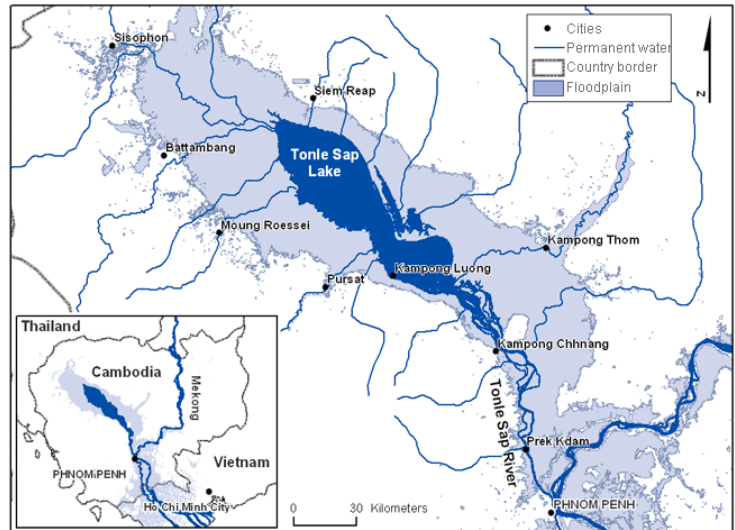
<sup>4</sup> Ibid.

<sup>5</sup> Ministry of Foreign Affairs of the Czech Republic. Bilateral Development Cooperation Programme of the Czech Republic Cambodia 2018–2023. [http://www.czechaid.cz/wp-content/uploads/2018/03/Programme\\_Cambodia\\_CzechAid\\_2018\\_EN.pdf](http://www.czechaid.cz/wp-content/uploads/2018/03/Programme_Cambodia_CzechAid_2018_EN.pdf)

<sup>6</sup> Ibid.

## CURRENT AQUACULTURE INTERVENTIONS

Tonle Sap Lake (TSL), the largest freshwater lake in Southeast Asia, plays an important role in Cambodia's economy as it supports the surrounding population through fishery production, water supply, and biodiversity.<sup>7</sup> TSL is the largest freshwater water body in Cambodia and its surface area varies between the wet and the dry season. It is estimated that over one million people live on or around TSL, and they depend on the water resources for domestic use, irrigation and industry, adjustment of the local climate, fish production, aquaculture, transportation, and tourism. The TSL basin has been damaged by increased fishing pressure, the negative effects of climate change (such as droughts and storms), deforestation in the basin, and decreased water inflow from the Mekong along with increased sediment rates caused by damming in the Mekong River basin. Worsening water quality in terms of heavy metals, pesticides and microbial pollution are also raising health concerns and risks.<sup>8</sup>



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<https://commons.wikimedia.org/w/index.php?curid=2351587>

Inland fisheries production is essentially dependent on several ecosystem services, especially the TSL basin floodwaters. In Cambodia, fisheries play a notable role in supporting household food security and livelihoods throughout the country.<sup>9</sup> Cambodians are one of the highest consumers of freshwater fish in the world, with annual per capita fish consumption estimated at 52.4 kg.<sup>10</sup> Fish and other aquatic animals (mostly from inland water bodies) account for over 80% of the total animal protein in Cambodian's diet.

In Cambodia, aquaculture is seen in both freshwater and marine environments. Over 50% of the total production is freshwater cage culture, while smallholder high-input pond aquaculture represents about 18% of total production. While aquaculture is one of the fastest growing food production sectors in Cambodia, it contributes only about 10% of the country's total fish production.<sup>11</sup> Aquaculture "holds considerable potential to improve nutrition and supplement household incomes through the sale of surplus catch. Thus, adoption of aquaculture production and improved resource management has the potential to contribute to poverty alleviation if it provides poor households with opportunities to diversify production systems and reduce food insecurity."<sup>12</sup>

In the Strategic Planning Framework (SPF) for Fisheries (2010-2019), the government identified

<sup>7</sup> Mardi Meas, Rina Heu, Laly Ma, KhyEam Eang, and Sokly Siev. 2020. Occurrence, Transportation, Regulation and Treatment Methods of Organic Pollutants in Surface Water: A Review on Case of Tonle Sap Lake, Cambodia. The 13th AUN/SEED-Net Regional Conference on Chemical Engineering 2020 (RCChE-2020)

<sup>8</sup> Binaya Raj Shivakoti and Pham Ngoc Bao (eds). 2020. Environmental Changes in Tonle Sap Lake and Its Floodplain: Status and Policy Recommendations, Institute for Global Environmental Strategies (IGES), Tokyo Institute of Technology (Tokyo Tech) and Institute of Technology of Cambodia (ITC)

<sup>9</sup> Richardson RB, Suvedi M. Assessing the Potential for Small-Scale Aquaculture in Cambodia. *Environments*. 2018; 5(7):76. <https://doi.org/10.3390/environments5070076>

<sup>10</sup> Hortle, K.G. *Consumption and the Yield of Fish and Other Aquatic Animals from the Lower Mekong Basin*; MRC Technical Paper No. 16; Mekong River Commission: Vientiane, Lao PDR, 2007.

<sup>11</sup> Joffre, O.; So, N.; Chheng, P. 2016. *Aquaculture Production in Cambodia: Trends and Patterns in Recent Years*; Inland Fisheries Research and Development Institute (Fisheries Administration) and WorldFish: Phnom Penh, Cambodia, 2016

<sup>12</sup> Richardson.

aquaculture as one of the three most important pillars of the country's fisheries development.<sup>13</sup> Thus, the expansion of fish farming was regarded as essential given the limited capacity of natural resources to sustain the country's growing population. To support the growth of small, medium, and large-scale freshwater aquaculture, the government budgeted over \$16 million under the 10-year framework. Recently, aquaculture extension is one of the national policies under the SPF for the fisheries sector.

## FINDINGS

### CURRENT AQUACULTURE INTERVENTIONS

As Cambodia looks to diversify its economy and generate more value-added jobs with more industrial opportunities, agriculture becomes a key focus in government and investment policies. While it offers many employment opportunities for the country, much of the labour is oftentimes considered informal and unskilled in nature. Therefore, Cambodia's agriculture sector needs to move away from its reliance on production only to value-added creation within the country. An important milestone in this transition is the transformation of curricula at the higher education levels. This literature review looks at current interventions in the aquaculture value chain as well as an overview of Cambodia's current aquaculture GTHS curricula and other GTHS opportunities and linkages.

The major interventions in the aquaculture value chain in the Tonle Sap region are as follows:

#### **The Cambodia Programme for Sustainable and Inclusive Growth in the Fisheries Sector (CaP FISH)**

CaP FISH is co-funded by the European Union (EU) and other United Nations (UN) agencies. It is a 5-year project (2019-2023) consisting of two components namely: aquaculture and capture fisheries. CaP FISH is designed to support the Cambodian government's efforts to achieve sustainable development, climate resilience and inclusivity of the Kingdom's freshwater and marine fisheries resources.<sup>14</sup> CaP FISH has a component focusing on research institutes and other projects supporting the fishing communities in 10 Tonle Sap Biosphere Reserve and coastal provinces. These other projects include:

- **Save Children Norway (Redd Barna)** offers support for fishing communities in Pursat, Kampong Chhnang, and Kampong Thom provinces to improve socio-economic status and resilience to climate change, through improved access to WASH, waste management systems, green economy initiatives, and education.
- **OXFAM** is implementing a four-year project (2021-2024) to support fishing communities in Battambang, Banteay Meanchey, and Siem Reap provinces to improve access to safe water supply, education, sanitation, waste management services, sustainable management of community natural resources, as well as to improve livelihoods and employment opportunities.
- **Aide et Action** is implementing a four-year project (2021- 2024) to support communities in Kep, Kampot, Sihanoukville, and Koh Kong provinces to become more resilient through sustainable local economic development, enhanced service delivery, and green growth which contributes to the reduction of poverty and inequality.
- **Wildlife Conservation Society (WCS)** is implementing a four-year project (2021-2024) in Siem Reap, Kampong Thom, Kampong Chhnang, Pursat, Battambang, and Banteay Meanchey provinces to enhance management and restoration of critical habitats to facilitate resilience to environmental change and to improve governance and policy to reduce drivers of

<sup>13</sup> Kunthy, R. 2021. Current status of sustainable aquaculture and resource enhancement in Cambodia. In F. A. Aya, L. D. de la Peña, N. D. Salayo, & E. A. Tendencia (Eds.), Proceedings of the International Workshop on the Promotion of Sustainable Aquaculture, Aquatic Animal Health, and Resource Enhancement in Southeast Asia (pp. 1–12). Tigbauan, Iloilo, Philippines: Aquaculture Department, Southeast Asian Fisheries Development Center.

<sup>14</sup> Vireak, Thou. "Capfish project swimming along: minister," July 2021. <https://www.phnompenhpost.com/business/capfish-project-swimming-along-minister>

environmental change.<sup>15</sup>

### 1. CaP FISH-Capture: Post-Harvest Fisheries Development

CaP FISH Capture (part of CaP FISH) has the overall objective of contributing to the achievement of social and economic development, food security, and poverty reduction. The project focuses on strengthening institutional capacity development and skills development in areas such as food safety, system implementation, matching investment support, and building business support mechanisms.<sup>16</sup> The project focuses on improving the curricula of higher education institutes in Cambodia. Such training curricula could cover various aspects of food processing: traditional techniques (pasteurization, vacuum packing, etc.) and emerging areas, e.g., high pressure processing; food safety methods; food quality and safety management systems and certification; and food science and technology subject matters. The project engages Higher Education Institutions (HEIs) to implement the modules. The HEIs offering agriculture degree programs in fish and food science and technology include the Royal University of Agriculture (RUA), National Institute of Agriculture (NIA) (Prek Leap), University of Battambang (UBB), and Institute of Technology of Cambodia (ITC)

### 3. Commercialization of Aquaculture for Sustainable Trade (CAST)

CAST (2019-2023) in Cambodia is a five-year program funded by the US Department of Agriculture. It is aligned with the Royal Government of Cambodia's Strategic Plan for Aquaculture Development. It promotes increased access to "seed" fish and fish feed while strengthening links in the value chain. The principal objectives of the project are to increase agricultural productivity in the freshwater aquaculture industry through improved inputs and practices and to increase trade in Cambodian aquaculture. To achieve the main objectives, the project supports capacity building in agricultural extension agents/services, improved farm management, creating sanitary and phytosanitary (SPS) standards, and providing training on aquaculture processes and management.<sup>17</sup>

The project aims to develop a national aquaculture association and market-driven focal farmer organizations. Aquaculture feed and seed input will be supplied with the appreciated market linkages. Other activities include private sector-led extension services, demonstration farms/research and training centers led by local communities, and access to finance for value chain actors with the support of relevant actors<sup>18</sup>. CAST collaborates with the World Vision Cambodia National Office to establish a partnership with AMK Microfinance Institution Plc. to facilitate access to financial services for the aquaculture sector in Cambodia. The partnership provides CAST beneficiaries with convenient and preferential financial services by helping finance actors better understand the risks and opportunities related to aquaculture.<sup>19</sup> CAST has also gained the support and collaboration of the Cambodia Aquaculturist Association (CAA) and is now discussing implementations of CAA's new strategic planning with an emphasis on financial sustainability.

### 4. ACTIVE for Youth

Agro-processing Career Development, Technical Training, and Improved Vocational Education for Youth (ACTIVE for Youth) was a 2-year initiative (2019-2021) implemented by People in Need (PIN), financed by the Czech Republic, in cooperation with the Czech University of Life Science and the Ministry of Education, Youth, and Sports (MoEYS). It was implemented in Kampong Chhnang province with the inclusion of agro-processing career development that provided technical training and improved vocational education for youths. The program aimed to provide equal access to a vocational training

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<sup>15</sup> Action Education. 27 Oct 2021. Press Release: For EU-funded projects to support fishing communities in Cambodia.

<https://action-education.org/sea/en/press-release-eu-capfish/>

<sup>16</sup> Schleining, Gerhard, and Sanja Vidacek Filipic. Aug 2021. "CAPFISH-Capture: Post-Harvest Fisheries Development." *United Nations Industrial Development Organization*.

<sup>17</sup> World Fish. Aug 2019. Commercialization of Aquaculture for Sustainable Trade (CAST) Cambodia: Baseline Study Report.

<sup>18</sup> U.S. Embassy in Cambodia. 1 Feb 2019. Cambodia, U.S. Mission. Commercialization of Aquaculture for Sustainable Trade (CAST) – Cambodia WISHH/Asa Food for Progress 2018.

<sup>19</sup> AMK MFI Plc. 26 Nov 2021. The MOU Signing Ceremony between World Vision Cambodia & AMK.

<https://www.amkcambodia.com/en/amk-world-vision-mou-eng/>



center for young people to increase their employment opportunities and subsequently, support the growth of the agricultural industry in Cambodia.<sup>20</sup> The project supported the following aspects: lab renovation, and capacity building for teachings through a locally applicable developed curriculum and food-processing teaching methodologies.

## 5. Partnership for Employment and Skills Development (PESD)

The PESD project (2020-2021) was implemented by People in Need (PIN) and financed by the Czech Republic, in cooperation with the National Vocation Institute of Battambang (NVIB) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), to develop a new technical training in vegetable and fruit processing for the technical students at NVIB. PESD is designed to improve technical and vocational education and training (TVET) program quality to meet national and international market demands, increase equitable access to TVET education for enhancing employment generator, promote Public-Private Partnerships (PPPs) between institutions and private sector, and other relevant actors, and improve the governance of TVET system.<sup>21</sup> Through these activities, the project aims to enable equal access to relevant technical education for youths to receive decent employment opportunities and foster the growth of the agro-processing industry in Cambodia.

In collaboration with GIZ and MoEYS, the project proposes a market-based processing of agricultural products curriculum on a national level based on the previous TVET projects in Cambodia that have been subsidized by Czech Development Agency (CDA).<sup>22</sup> At the regional level, the project aims to transform NVIB into a sustainable center for the processing of agricultural products, thus opening access for its students to improved equipment and facilities that meet local market needs. The PIN emphasizes the development of a newly revised curriculum for the NVIB and the improvement of its facilities to meet the aforementioned objectives.

The implementation of this project is built on PIN's experience from previous CZDA- funded projects, including Fostering Transition to Employment for Youth (FTE4Youth, 2019–2021) and Agro-processing Career Development, Technical Training, and Improved Vocational Education for Youth (ACTIVE4Youth, 2018-2020), implemented in Kampong Chhnang province.<sup>23</sup>

## 6. Tonle Sap Poverty Reduction and Smallholder Development Project

The International Fund for Agricultural Development (IFAD) project (2017-2023) responds to the need for increased productivity of integrated farming systems and improved livelihoods of the resource-poor households in 196 communes in the provinces of Banteay Meanchey, Kampong Cham, Kampong Thom, and Siem Reap. It aims to increase agricultural productivity, improving rice yields, improving access to markets, improving rural infrastructure, and improving capacity and access to rural financial services.<sup>24</sup> It will cooperate with the government and the Ministry of Agriculture, Forestry and Fisheries to provide assistance in areas of management, procurement and finance, agriculture, and policy development.

## 7. Agricultural Services Programme for Innovations, Resilience, and Extension (ASPIRE)

Another IFAD project, ASPIRE, (Implementation Date was June 2015 and extended to 31 December 2022 with the Financial Closing Date of 30 June 2023) is designed to assist the Royal Government of Cambodia in developing the policies and capacity to deliver improved extension services around the model of agriculture extension services and providing a program-based approach for the extension subsector.<sup>25</sup> This model was implemented through a national investment program that provides smallholder farmers

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<sup>20</sup> People in Need. 2022. ACTIVE for Youth: Agro-Processing Career Development, Technical Training, and Improved Vocational Education for Youth.

<sup>21</sup> People in Need. 2022. Partnership for Employment and Skills Development (PESD).

<sup>22</sup> CZDA. Partnership for Employment and Practical Skills Building in Battambang Province, Cambodia. <http://www.czechaid.cz/en/projekty/17320/>

<sup>23</sup> People in Need. 28 Apr 2021. Adding Value to Cambodia's Agricultural Sector. <https://www.peopleinneed.net/adding-value-cambodia-agriculture-7626gg>

<sup>24</sup> IFAD. 2009. President's Report - Tonle Sap Poverty Reduction and Smallholder Development Project.

<sup>25</sup> ASPIRE. About ASPIRE. <https://aspirekh.org/about>

with access to quality information services, managing an effective system that links researchers and knowledge-based agencies to extension agents in all affected sectors, and investing in climate-resilient infrastructure.<sup>26</sup>

## 8. Higher Education Improvement Project (HEIP)

The Higher Education Improvement Project (HEIP) is funded by the World Bank (2018-2024) This project aims to “improve the quality, relevance and equity of education and research at targeted higher education institutions, to improve governance in the sector, and to provide immediate and effective response in case of an eligible crisis or emergency.”<sup>27</sup> The project focuses on specific investments to enhance learning initiatives improving the Agro-Industry Program, including learning and training activities related to food processing and the possible development of an Agriculture and Food Business Incubation Centre. There are four components to the project, the first component being improving teaching and learning capacity. The second component is improving research in science, technology, engineering, and mathematics (STEM) and agriculture. The third component is strengthening sectoral governance and project management, while the fourth component is the contingent emergency response.

## OPPORTUNITIES

### Key Gaps and Issues

Operationalizing TVET programs, particularly the aquaculture modules at GTHSs, could consider challenges and best practices encountered by similar agricultural programs and interventions.

**Relevance.** The project must be relevant to the needs of the students, institutions, communities, and industries. For example, shortcomings were found in the performance report of the CaP FISH project where the curriculum and research priorities of the universities are not sectoral need-based and there is a lack of linkages along the value chains and collaborative networks. That is, academic institutions’ research is often not applicable to the industry.

As noted above, the proposed project is aligned, for example, with CZDA’s current cooperation program 2018-2023, the Development Cooperation Strategy of the Czech Republic 2018-2030, SDGs under the 2030 Agenda for Sustainable Development, and Global Partnership for Effective Development Cooperation.

The above literature review and the interviews highlights the range of projects and programmes being implemented in different provinces around the TSL as well as the gaps in aquaculture curriculum work in GTHS. The importance and relevance of this and future connected work are well established.

**Weak Aquaculture Curriculum.** Currently, a VOD stakeholder suggested that the GTHS aquaculture curriculum is “too general” and “not linked to opportunities for students in the marketplace or further tertiary education.” This stakeholder noted that students are presently provided with “nice to have, but impractical, content.” Interview respondents all identified that there is currently a gap in the GTHS curriculum regarding aquaculture. Respondents noted that while some aquaculture content existed in some schools (see GTHS Overview below), the content needs an “urgent review and upgrade to make it useful.” The VOD respondents highlighted the “unique opportunity to link a revised GTHS aquaculture curriculum with local markets and further learning opportunities.”

**Value Chain.** Following on from the above point, the lack of current GTHS agriculture (and specific aquaculture) curriculum linkages to the value chain was a notable theme in the interviews with VOD and other stakeholders. Research from other countries, for example, Sierra Leone, involved in

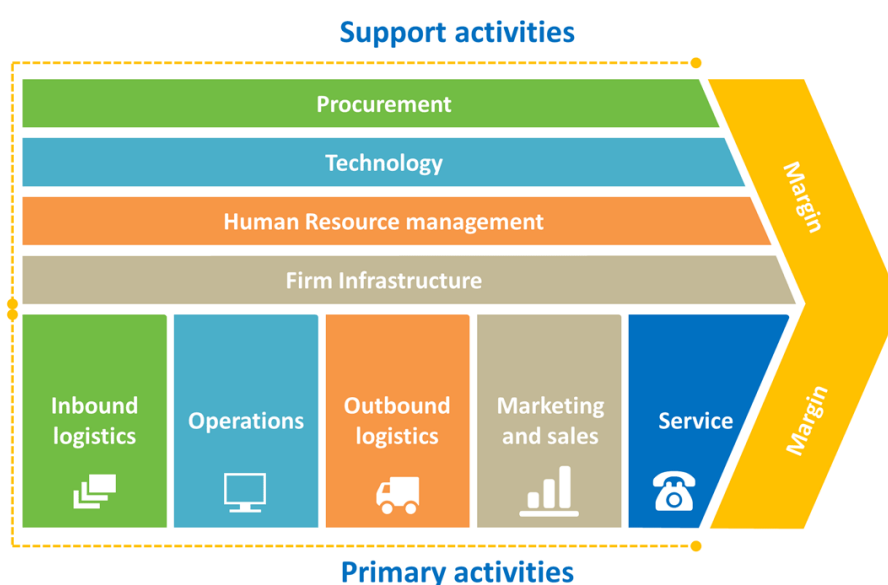
<sup>26</sup> IFAD. 2014. President's Report - Agriculture Services Programme for Innovation, Resilience and Extension (ASPIRE).

<sup>27</sup> World Bank. Nov 2017. Higher Education Improvement Project (HEIP) – Cambodia.

<https://documents1.worldbank.org/curated/en/822861511362670205/pdf/SFG3807-REVISED-IPP-P162971-Box405313B-PUBLIC-Disclosed-11-27-2017.pdf>

aquaculture and high school linkages shows that considering and including the traditional primary and support value chain activities is vital to creating a broader and more inclusive range of opportunities for young people, and, importantly, including activities not usually accessible for young women or people with disabilities in those specific communities (see graphic below for these activities).<sup>28</sup> Curriculum development, therefore, should not be limited to, for example, food processing only but should consider other aspects and related opportunities in the food chain. Interview stakeholders were unanimous that a comprehensive value chain linked curriculum holds many untapped opportunities for GTHS students in Cambodia.

The interviews highlighted current RUA research and activities that link high school agriculture (and some aquaculture) content with local value chains. While this work is still in its early phases, RUA has the capacity and interest to support further development of specific aquaculture curriculum development and associated value chain activities.



Source: <https://skajipal.blogspot.com/2021/06/value-chain-primary-activities-value.html>

A graphic representation from Feed the Future Cambodia Rice Field Fisheries II is also provided that outlines key value chain and community linkages in a rice-fishery project (Annex 8).

At present, GTHS students are linked to the private sector through internship opportunities, but various problems exist with the current system in that internships are difficult to access, there is little private sector incentive for offering internships due to the low capacity of students and organisational risks, and students report little value in these internships.

Finally, the VOD respondents also noted that while the GTHS students are introduced to “larger business issues,” there is no specific input linking aquaculture to the specific components of local fishery value chains. They added that business and technology (especially green technology) are also important considerations as new curriculums are considered and developed.

**Capacity.** An important issue for MoEYS under its current strategy is the training of technical teachers to be competent and qualified. Discussions with key MOEYS and sectoral stakeholders noted the importance of building the capacity of teachers specifically to teach, monitor, and develop the aquaculture curriculum. Given the low level of current aquaculture input, significant input is required to improve the curriculum as well as HEI and the teaching thereof.

<sup>28</sup> Van Houten, S. & Pugh, S. Context Analysis in Tonkolili District, Sierra Leone. Concern Worldwide, July 2022.

Developing a career-oriented and employment-ready curriculum for aquaculture GTHS graduates will be an important prerequisite. As there are other agricultural programs at HEIs, the current project needs to have the right balance of positioning the aquaculture modules which will allow graduates to find an appropriate job in the sector or continue their education journey at an HEI. This will require collaboration from existing interventions with HEIs to provide useful inputs for the module to pilot.

Furthermore, graduates from GTHSs lack practical experience. The schools have workshops and programs including a 3-month internship in year three (grade 12) of the programs. It is, however, still difficult to find private establishments that offer internships. Most of the apprenticeships in Cambodia take place in the informal sector or informally in the formal sector, and thus, they are not part of a formal VET program. Finding robust data and information on such apprenticeships is challenging.

In the discussions, there was also a strong emphasis on the building of VOD staff capacity in aquaculture curriculum development as well as ongoing monitoring and evaluation. Without this capacity building, VOD will be unable to manage the additional work. This issue of VOD aquaculture capacity development is important to the proposed project's impact and sustainability.

**Important other issues in the curriculum development.** While there is currently a focus on food processing and organic pollutants, interviews with VOD and other technical expert respondents stated that there are sizeable gaps in the curriculum. These organic pollutants include aliphatic hydrocarbons, ether, ketone, phenol, phthalate, fatty acid ester, other oxygenated compounds, benzene and polycyclic hydrocarbons, nitrogenous, sulphur, phosphorus, pharmaceuticals, personal care product, and pesticide, which “were found in lake’s surface water because of agriculture, aquaculture and human activities.”<sup>29</sup> Research highlights effective and ineffective removal methods and emphasizes the importance of teaching students and communities about the presence of pollutants in the lake water, the water quality, prevention strategies, and related food processing issues.

**Need for equipment.** The interviews highlighted the gaps in the availability of related equipment to properly instruct GTHS students in aquaculture. Unfortunately, this specific information had not been shared by VOD at the time of this report. It is suggested that CDA communicate directly with VOD to understand what equipment is required for the implementation of an aquaculture curriculum.

**Data collection.** In January 2022, CGIAR highlighted some of the challenge associated with monitoring and evaluating general aquaculture projects in Cambodia. The key messages are summarised in the accompanying box. These challenges and key messages could support the monitoring and evaluation of the proposed project.

## Linkage Options

### Key Project Linkages

This assessment highlighted the importance of the following linkages for the proposed project:

1. **CDA.** Based on this assessment and further discussions in the Embassy, CDA could support proposal development, project development, monitoring, and funding.
2. **VOD.** Based on existing and planned GTHS activities, VOD could support the selection of a pilot site,

#### Key messages

- A consistent approach to benchmarking and performance assessments enables standard evaluations of aquaculture systems and the benefits associated with the uptake of research and innovation, which is key to sound research, policy, and investment decisions.
- Dissemination systems for aquaculture research and innovation must account for context specific opportunities and constraints that affect adoption, with a specific focus on enablers for adoption by vulnerable groups and long-term sustainability.
- Inclusive business models, such as the local service provider model or collective farming, offer important opportunities for women, youth, and other small-scale value chain actors, but require greater support from public and private sectors.
- Open access tools and standard methods for data generation can contribute to a data ecosystem to support the development and implementation of evidence-based interventions at national, regional, and global scales.

*Source: CGIAR: Measuring impact of innovations on aquaculture system performance, Jan 2022.*

<sup>29</sup> Mardi Meas, Rina Heu, Laty Ma, KhyEam Eang, and Sokly Siev. Occurrence, Transportation, Regulation and Treatment Methods of Organic Pollutants in Surface Water: A Review on Case of Tonle Sap Lake, Cambodia. The 13th AUN/SEED-Net Regional Conference on Chemical Engineering 2020 (RCChE-2020)

- input into the curriculum development, support teacher and VOD capacity building, and monitoring.
3. **Private GTHS.** Based on discussions with Martalia Lo, there is the opportunity to link with the private GTHS for curriculum development, implementation, and project review.
  4. **HEIs.** Based on the conversation with RUA respondents and their current work in aquaculture curriculum development with a focus on the value chain, there is an opportunity to collaborate with them and their teams for the specific curriculum development for this proposed project. This would also ensure project coherence and reduce the risk of duplication.
  5. **Czech Expertise.** There is the opportunity to utilise the expertise of Czech expertise, for example, Dr Tereza Slámová, who has extensive experience in food processing in Cambodia and other countries. Discussions with her highlighted her and RUA's links with the University of Louvain (Belgium) that could be used as part of the technical input into the proposed project.
  6. **EU.** Discussions with François Bernede (EU delegation to Cambodia) highlighted the potential opportunities with the EU. The EU is planning to provide Budget Support to MoEYS to improve GTHS starting January 2024. During the interview, Mr Bernede expressed interest in CDA's proposed project, noting that if the project can start soon in 2023 and it is able to show concrete achievements and impacts, then there might be the opportunity to expand the projects beyond the one pilot site to other GTHS, HEIs, and provinces as part of the EU's Budget Support to MoEYS. Mr Bernede has a strong understanding of the associate issues following his own discussions with VOD visits to some of the GTHS. CDA would also like to work with the EU on policy dialogue with MoEYS to support the upcoming strategy of the Ministry and advocate for improved data management and public finance management at the Ministry level. These are opportunities that are both interesting and timely for CDA. Mr Bernede concluded that these initial discussions were good to strengthen coherence and complementarity and explore future potential collaboration.

### *Other Potential Linkages*

**CaPFISH**, and particularly **CaPFISH CAPTURE**, can provide added value to the current project by improving the aquaculture curriculum at the GTHSs as they did with HEIs. The CaPFISH framework is designed to develop a specialized academic curriculum to address the shortage of competent employees in the field. The training curricula concentrate on achieving sustainable development and climate resilience and have a component on research institutes that can be modified and adapted into future and current GTHS curricula to align with the student's needs. Likewise, the project could consider incorporating agro-food processing into the aquaculture module, where the safety and certification of processed food is a crucial component for the success of the supply chain. This can be done with the expertise of the **PESD** project in which they also try to enhance related TVET training to the national and international standards (in addition to the specific Czech expertise mentioned above).

Internal capacity building for the pilot GTHSs can be co-organized with the support of similar interventions such as **CaPFISH** and **ACTIVE for Youth** through technical teacher training and related lab improvement initiatives.

As far as capacity building for technical trainers is concerned, the gist of the training curricula should revolve around the various aspects of food processing such as traditional techniques (pasteurization, vacuum packing, etc.) and emerging areas, for example, high pressure processing; food safety methods; food quality and safety management systems and certification; and food science and technology subject matters. These components can be modified on the depth and breadth of courses related to aquaculture programs to be offered at the GTHSs. Therefore, it is worth revisiting the requirements for technical trainers in the field of aquaculture to match the vigour of the curricula at both the trainer's and trainee's levels.

In addition to curriculum development and capacity building for teachers, **ACTIVE for Youth** can be a part when it comes to fostering entrepreneurship skills among GTHS students through engaging with private actors. Similarly, **CAST** facilitating the work of the aquaculture supply chain can assist in bridging the gap between theoretical learning and practical experience through dialogue with aquaculture

supply chain actors and exposure visits to industrial and individual fish farms. Likewise, through CAST's partnership with microfinance institutes, that is, AMK microfinance, access to small and medium-sized aquaculture business loans can be activated if entrepreneurship is to be encouraged among GTHS students.

## GTHS OVERVIEW

**Introduction.** Technical Education is a relatively new function in MoEYS. The government formally approved the Technical and Vocational Education and Training (TVET) Policy 2017–2025 on 16 June 2017. The 2015-2019 Master Plan set out the government's goal to integrate TVET at the Upper Secondary level with the introduction of GTHS to educate students with sound vocational awareness and professional knowledge to respond to the rapid changes in an information-oriented industrial society. The vision of the GTHSs is that the students acquire excellent knowledge, technical skills, and moral values to meet labour market demands and to continue life-long learning.<sup>30</sup> The mission is to orientate, promote and provide technical education services at upper secondary level in cooperation with stakeholders and development partners. The Royal Government of Cambodia has a several goals related to establishment of technical education system at upper secondary level such as to standardize technical education curricula; to expand GTHSs in every province/city and to increase enrolment rates in technical education. Eight strategies were identified in support of the goals above as follows:

1. Legislative Framework to Back Up General and Technical Education System
2. Establishment of General and Technical Education System
3. Development of Technical Education Curricula and Textbook
4. 4. Establishment of Technical Education Facilities and Installation of Equipment
5. Training of Technical Education Teachers and promotion of Technical Education Teacher's Qualification and competency
6. Accreditation and Quality Assurance of Technical Education
7. Establishment plan for Sustainability of Technical Education
8. Gender Mainstreaming.

According to the VOD, presently, 20 secondary schools are providing technical education in the modules of (1) Accounting, (2) Agro-Food Processing, (3) Agronomy, (4) Computers, (5) Digital Media Design (6) Electricity, (7) Electronics, (8) Mechanics, (9) Tourism, and (10) Veterinary (Annexes 2 and 3). Currently, aquaculture is taught under agronomy and agro-food processing.

**VOD student data.** In terms of this proposed project, the summary of students and technical teachers in the areas of agronomy, aquaculture, and food processing for 2021-2022 shows a total of 1,699 students and 125 teachers (student to teacher ratio of 1:14) (Table 1). For aquaculture, there is a total of 962 students (36% F, 64% M). These tables also highlight the overall lower percentage of female students (39%) and teachers (28%). This gender gap presents opportunities for the proposed program to identify appropriate responses to closing these gender differences.

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<sup>30</sup> CZDA. Initial Project Proposal. Support and development of educational programmes in the field of agriculture at General and Technical High Schools in Cambodia.

Table 1: Summary of Students & Technical Teachers in Agronomy, Aquaculture, & Food Processing for 2021-2022

No.	Major	Students		Teachers	
		Total	Female	Total	Female
1	Agronomy	602 (63%)	360 (37%)	54 (73%)	20 (27%)
		<b>962</b>		<b>74</b>	
2	Aquaculture	281 (64%)	160 (36%)	30 (75%)	10 (25%)
		<b>441</b>		<b>40</b>	
3	Food Processing	156 (53%)	140 (47%)	6 (55%)	5 (34%)
		<b>296</b>		<b>11</b>	
<b>Total</b>		<b>1,039 (61%)</b>	<b>660 (39%)</b>	<b>90 (72%)</b>	<b>35 (28%)</b>
		<b>1,699</b>		<b>125</b>	

Currently, VOD was not able to provide any data on the percentage of students entering the labour market and those continuing on to higher education. VOD provided other data on the number of students in the three agriculture programmes at GTHS nationwide which can be found in the annexes. Some of this data provides specific data for aquaculture in terms of staff (Annex 7) and students and teachers (Annex 8). This data includes:

- ANNEX 4: Statistics of Students Enrolled in the First Year of Technical Education by Specialisation (2013-2021)
- ANNEX 5: Statistics of Students Enrolled in Technical Education by Specialisation (2013-2021)
- ANNEX 6: Status of Technical Staff for Academic Year 2020-2021
- ANNEX 7: Status of Staff in Agronomy, Aquaculture, & Food Processing for 2020-2021
- ANNEX 8: Students & Technical Teachers in Agronomy, Aquaculture, & Food Processing for 2021-2022

## PROPOSED PROJECT

### INITIAL PROJECT PROPOSAL

**Initial project proposal.** CZDA produced an initial project proposal with VOD. The key data is listed below from the proposal.

#### Stakeholders

- Faculty of Fisheries, Royal University of Agriculture, Phnom Penh
- Provincial Councils and Governmental Departments in Tonle Sap region
- Relevant private sector in Tonle Sap region
- GTHSs in Tonle Sap region
- Vocational Department, Ministry of Education, Youth and Sports (MoEYS)
- Other donors (UNIDO, AFD, EU, IFAD)

#### Beneficiaries

- Students at the GTHSs and their families

- Technical teachers at the GTHSs
- Private sector in Tonle Sap region
- Youth, potential students, and technical teachers from Tonle Sap region Royal University of Agriculture.

#### *Expected objectives, outcomes, and activities*

**Overall Objective:** To contribute to the increase in the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship in Cambodia (SDG 4-4.)

**Specific Objective:** To strengthen the quality of agriculture education at GTHS by (i) updating agriculture curricula and creating textbooks, (ii) linking GTHS to relevant private sector and universities, and (iii) improving practical training and equipment.

**Expected Result 1:** Agriculture programmes at GTHS are strengthened, curricula are updated, and textbooks created

Activities:

- Update of agriculture curricula with the subject of digital marketing and modules of aquaculture/ fish products processing
- Elaboration of textbooks for 3 agriculture programmes (including e-learning)
- Training for technical teachers at selected GTHSs (hard skills and soft skills)
- Strengthening linkages of technical and vocational education and training at regional level
- Identification of factors preventing young people from studying at GTHSs and support enabling environment at given GHTSs, especially for female and disadvantaged groups
- Introduction of School-based management model at involved GTHSs

**Expected Result 2:** New Agro/Food processing programme established, equipped and fish processing module piloted in Tonle Sap region

Possible activities:

- Replication of existing curriculum on Agro/Food-processing in cooperation with MoEYS
- Renovation of premises and purchasing of necessary equipment
- Establishment of partnership and internships with local private sector
- Establishment of partnership and internships with a University
- Training for technical teachers (hard skills and soft skills)

**Expected Result 3:** Aquaculture module within Animal husbandry programme at GTHS piloted in Tonle Sap region

Activities:

- Elaboration of aquaculture module to agriculture curricula (based on Kampong Chheuteal GTHS module and in cooperation with academic sector and private sector)
- Establishment of partnership and internships with local private sector
- Presentation of study opportunities and workshop for students at Faculty of Fisheries, RUA
- Training for technical teachers (hard skills and soft skills).

*Expected duration of implementation.* 2023 - 2025



## Risk and Assumptions.

RISKS	ASSUMPTIONS
The number of students enrolled in the programmes in the target region will not meet the target	Opportunities created for skilled workers in the region in aquaculture (Private Sector, Other donors)
Families prefer fast income over education	Better opportunities for skilled workers in the region with higher salaries. Possibilities of scholarships at universities (Private Sector Other donors universities)
Changes in support of agriculture value chains by the government	Long-term strategies issued by development partners, Team Europe framework, approved by Royal Government of Cambodia (RGC, Other donors)
Sustainability of equipment and materials at GTHS	GTHSs are supposed to create business plans to ensure financial sustainability, support by the ministry in a longer term (MoEYS)
Lack of interest of private sector to participate	Preliminary assessed need for skilled workers in aquaculture articulated by other donors involved in the sector in Tonle Sap (Other donors, private sector)

## ASSESSMENT SUMMARY

This assessment noted the relevance of the proposed project which clearly highlights the gaps in the aquaculture curriculum in the GTHS as well as the needs of students to be supported to contribute to markets and able to continue their associated studies in HEIs. There is well-established evidence for the success of aquaculture projects on the TSL. Research shows that aquaculture projects and technology “have the potential to contribute to food security, nutrition and household income and to the conservation of the wild fisheries of the Tonle Sap Lake.”<sup>31</sup> In terms of coherence, the proposed project is well aligned with to previous and current aquaculture projects on the TSL, MoEYS and VOD priorities, HEI research and support, Czech technical assistance, and EU plans to upgrade GTHS in Cambodia. Importantly, no projects are currently looking exclusively at supporting GTHS students and teachers in aquaculture curriculum development and capacity building.

## PROPOSED ACTIVITIES

Based on the desk review and the key stakeholder interviews, this assessment agrees with the activities above in the Initial Proposal and highlights the key following activities moving forward:

NO.	ACTIVITY	STAKEHOLDERS
1	Aquaculture curriculum development	CDA, VOD, RUA, Czech Technical Expert, & Private GTHS (technical team)
2	Development of textbooks and teaching materials	Technical team
3	Capacity development of VOD lead contact	Technical team
4	Capacity development of VOD staff	Technical team
5	Capacity development of teachers	Technical team

<sup>31</sup> Richardson RB, Suvedi M. Assessing the Potential for Small-Scale Aquaculture in Cambodia. *Environments*. 2018; 5(7):76. <https://doi.org/10.3390/environments5070076>

6	Provision of necessary equipment (hard and soft components in consultation with the technical team)	CDA
7	Monitoring and evaluation	CDA, VOD, and external evaluation
8	Establish ongoing feedback mechanisms to the EU for the possibility of future collaboration if the proposed project is successful	CDA

There are a few comments on the proposed activities.

**Approach.** The approach was debated by the various stakeholders. For option 1, some stakeholders argued for a pilot project in one school that could be assessed and then, if successful, be considered for expansion. For option 2, other stakeholders noted that, in general, curriculum development should not be done as a because it is difficult to go back to the previous situation if the pilot is unsuccessful. Rather, curriculum development should be a long-term commitment that needs monitoring and adaptation along the way. Thus, these stakeholders recommended that all GTHS that currently run an aquaculture or similar programme should be included in the implementation phase directly. The ultimate decision about the approach is something that CZDA can consider with its partners during the proposal phase.

**GTHS engagement.** All stakeholders emphasized the importance of ensuring that the selected one GTHS (option 1) or all GTHS selected (option 2) are included in the development process.

**VOD cooperation.** The cooperation with VOD is essential to the success of the proposed project. One way to strengthen this cooperation, create ownership, and increase impact is to assign a dedicated person from VOD with the right skills set as the contact and lead person. If it is not possible to find the person with the right skill set at VOD, then perhaps a funded position within VOD might be considered.

**Czech expertise.** As CZDA is considering the inclusion of Czech expertise, it is important that they cooperate closely with RUA to ensure that the GTHS aquaculture curriculum development is aligned with RUA's current work on the GTHS curriculum for agriculture. Working alongside a local institution doing something similar will be helpful.

**Conclusion.** This assessment found that CZDA is well placed to lead the proposed support and development of educational programmes in the field of agriculture (specifically aquaculture) at GTHS in Cambodia. The proposed project is relevant (to the needs of the beneficiaries) and coherent (both internally to CZDA's strategic priorities and externally to other development and HEI initiatives) . There are clear gaps and opportunities for implementation and project expansion and alignment to other important initiatives (e.g., EU) if the project is successful.

# ANNEXES

## ANNEX 1: Documents Consulted and Resources

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## ANNEX 2: General Technical High Schools with areas of Specialisation

No.	Name of School	Location	Technical Skills Specialization
1	Anuwat General and Technical High School of the Kampong Chheur Teal Institute of Technology	K. Thom	Electricity, Electronics, Veterinary, Agronomy
2	Samdech Akka Moha Sena Padei Techo Hun Sen - Rota, Khsach Kandal, General and Technical High School	Kandal	Electricity, Electronic
3	Preah Bath Borom Neath Norodom Sihamoni General and Technical High School	K. Chhang	Agronomy, Veterinary, Electricity, Agro-Food Processing
4	Private Saint Francois General and Technical High School	Takeo	Veterinary, Tourism
5	Pouk General and Technical High School	Siem Reap	Electricity, Electronic
6	Hun Sen Chumpou Voin General and Technical High School	Phnom Penh	Mechanic, Electronic, Electricity
7	Bavet General and Technical High School	Svay Rieng	Agronomy, Electricity, Agro-Food Processing
8	Preah Reach Samphear General and Technical High School	Kampot	Electricity, Mechanic
9	Preah Norodom Sihamoni General and Technical High School	Kampot	Agronomy, Veterinary
10	Chea Sim Tbeng Meanchey General and Technical High School	Preah Vihear	Agronomy, Electronic, Veterinary
11	ACT Private General and Technical High School	PP	Digital Media Design, Accounting and Business Management, Tourism

12	Poipet Don Bosco Private General and Technical High School	Poipet	Computer, Electricity
13	Community Development Institute of Chea Sim Kamchay Mear University	Prey Veng	Accounting, Veterinary, Electronic, Agronomy
14	Technical and Vocational Training Institute of Heng Samrin Tbong Khmum	Tbong Khmum	Agronomy, Computer
15	General Technical High School Banteay Chhmar	Banteay Meanchey	Mechanic
16	Hun Sen Peam Chi Kang Technical High School	Kampong Cham	Electricity, Agronomy, Electricity, Electronic
17	Techo Sen Koh Kong General & Technical High School	Koh Kong	Mechanic, Electronic
18	Cambodia-Japan Technical Education Center	Siem Reap	(Mostly Short Courses but maybe will upgrade soon) Japanese language, agriculture, computer, FO, FB, Food processing

Note: No. 18 is not considered as one of GTHS but was included in the monthly report to MOEYS for technical schools under MOEYS

## ANNEX 3: Student statistics in General and Technical High Schools (2017-2021)

No.	Name of School	Location	Student Dorm	2017-18		2018-19		Increase/ Decrease (+/-)		2019-2020		2020-2021		Increase/ Decrease (+/-)	
				Total	F	Total	F	Total	F	Total	F	Total	F	Total	F
1	Anuwat General and Technical High School of the Kampong Chheur Teal Institute of Technology	K. Thom	Yes	650	312	586	273	-64	-39	554	276	593	295	+39	+19
2	Samdech Akka Moha Sena Padei Techo Hun Sen - Rota, Khsach Kandal, General and Technical High School	Kandal	-	248	32	296	41	+48	+9	317	43	376	41	+59	-2
3	Preah Bath Borom Neath Norodom Sihamoni General and Technical High School	K. Chhang	Yes	239	94	332	116	+93	+22	421	172	472	216	+51	+44
4	Private Saint Francois General and Technical High School	Takeo	Yes	77	26	99	37	+22	+11	116	52	144	71	+28	+19
5	Pouk General and Technical High School	Siem Reap	-	37	0	83	1	+46	+1	115	2	194	6	+79	+4
6	Hun Sen Chumpou Voin General and Technical High School	Phnom Penh	-	75	10	110	14	+35	+4	230	30	274	41	+44	+11
7	Bavet General and Technical High School	Svay Rieng	Yes	49	14	77	28	+28	+14	124	44	163	64	+39	+20
8	Preah Reach Samphear General and Technical High School	Kampot	-	12	0	20	5	+8	+5	50	8	92	22	+42	+14
9	Preah Norodom Sihamoni General and Technical High School	Kampot	-	84	38	154	85	+70	+47	158	96	112	72	-46	-24

10	Chea Sim Tbeng Meanchey General and Technical High School	Preah Vihear	-	-	-	49	26	+49	+26	91	44	141	64	+50	+20
11	ACT Private General and Technical High School	PP	-	-	-	16	11	+16	+11	32	19	58	37	+26	+18
12	Poipet Don Bosco Private General and Technical High School	Poipet	Yes	-	-	33	14	+33	+14	73	32	100	43	+27	+11
13	Community Development Institute of Chea Sim Kamchay Mear University	Prey Veng	-	-	-	140	76	+140	+76	191	103	260	135	+69	+32
14	Technical and Vocational Training Institute of Heng Samrin Tbong Khmum	Tbong Khmum	Yes	-	-	108	57	+108	+57	141	79	135	81	-6	+2
15	General Technical High School Banteay Chhmar	Banteay Meanchey	Yes							15	0	24	0	+9	0
16	Hun Sen Peam Chi Kang Technical High School	Kampong Cham	-							72	36	138	71	+66	+35
17	Techo Sen Koh Kong General & Technical High School	Koh Kong	Yes									48	10	+48	+10
	Total			1,471	526	2,103	784	+632	+258	2700	1036	3324	1269	624	233



#### ANNEX 4: Statistics of Students Enrolled in the First Year of Technical Education by Specialisation (2013-2021)

No.	Specialization	Aca. Year 2013-14	Aca. Year 2014-15	Aca. Year 2015-16	Aca. Year 2016-17	Aca. Year 2017-18	Aca. Year 2018-19	Aca. Year 2019-2020	2020-2021	
									Total	Female
1	Electricity	132	201	163	192	249	321	490	443	62
2	Electronics	62	66	124	94	123	175	155	224	37
3	Veterinary	76	115	86	85	88	159	117	84	57
4	Agronomy	38	48	170	95	186	294	266	263	152
5	Mechanics	-	-	-	-	17	15	49	54	9
6	Tourism	-	-	-	-	-	34	28	32	26
7	Computer	-	-	-	-	-	54	57	65	44
8	Accounting	-	-	-	-	-	56	28	50	44
9	Agro-Food Processing	-	-	-	-	-	-	57	56	49
10	Digital Media Design	-	-	-	-	-	-	13	14	3
<b>Total</b>		<b>308</b>	<b>430</b>	<b>543</b>	<b>543</b>	<b>663</b>	<b>663</b>	<b>1260</b>	<b>1295</b>	<b>483</b>
									<b>1,778</b>	

## ANNEX 5: Statistics of Students Enrolled in Technical Education by Specialisation (2013-2021)

No.	Specialization	Aca. Year 2013-14	Aca. Year 2014-15	Aca. Year 2015-16	Aca. Year 2016-17	Aca. Year 2017-18	Aca. Year 2018-19	Aca. Year 2019-2020	2020-2021	
									Total	Female
1	Electricity	248	373	259	298	493	625	880	1151	151
2	Electronics	144	167	229	220	334	367	391	508	96
3	Veterinary	89	93	244	262	239	304	301	317	207
4	Agronomy	178	234	229	267	386	575	709	726	437
5	Mechanics	-	-	-	-	19	33	80	121	10
6	Tourism	-	-	-	-	-	45	68	86	63
7	Computer	-	-	-	-	-	80	127	159	105
8	Accounting	-	-	-	-	-	74	74	108	86
9	Agro-Food Processing	-	-	-	-	-	-	57	122	105
10	Digital Media Design	-	-	-	-	-	-	13	26	9
Total		-	-	-	1147	1471	2103	2700	3324	1269

## ANNEX 6: Status of Technical Staff for Academic Year 2020-2021

No and School Name	Technical Staff	Vocational Level								Certificate											
		Primary		Lower Secondary		Upper Secondary		Total	Female	Upper Secondary		Associate's		Bachelor's		Master's		PhD		Total	Female
		Total	Female	Total	Female	Total	Female			Total	Female	Total	Female	Total	Female	Total	Female	Total	Female		
<b>1. Anuwat Kompong Chher Teal High School, Kampong Thom Province</b> វិ.ច.ប.អនុវត្តកំពង់ឈើទាល ខេត្តកំពង់ធំ	Electrician	0		3	0	3	1	6	1	1	0	0	0	5	1	0	0	0	0	6	1
	Electronic	0	0	4	1	1	0	5	1	0	0	1	1	4	0	0	0	0	0	5	1
	Agronomy	0	0	5	3	0	0	5	3	0	0	1	1	4	2	0	0	0	0	5	3
	Aquaculture	0	0	10	5	0	0	10	5	0	0	1	1	9	4	0	0	0	0	10	5
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>26</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>22</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>10</b>
<b>2. Norodom Sihakmony High School, Kampong Chhnang</b> វិ.ច.ប. ព្រះបាទសម្តេចព្រះបរមនាថ នរោត្តម សីហមុនី ខេត្តកំពង់ឆ្នាំង	Electrician	0	0	1	0	7	0	8	0	0	0	1	0	7	0	0	0	0	0	8	0
	Agronomy	0	0	6	2	7	4	13	6	3	1	1	1	9	4	0	0	0	0	13	6
	Aquaculture	0	0	1	0	7	2	8	2	0	0	1	0	7	2	0	0	0	0	8	2
	Food processing	0	0	0	0	4	4	4	4	0	0	0	0	4	4	0	0	0	0	4	4
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>2</b>	<b>25</b>	<b>10</b>	<b>33</b>	<b>12</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>27</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>12</b>
<b>3. Private Stansorfone, Takeo</b> វិ.ច.ប. ឯកជនសន្តប្រាង្គស្នួរ ខេត្តតាកែវ	Agronomy	0	0	0	0	0	0	0	0	4	2	0	0	5	2	0	0	0	0	9	4
	Tourism	0	0	0	0	0	0	0	0	1	0	0	0	3	3	1	0	0	0	5	3
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>7</b>
<b>4. Bavet High School, Svay Rieng</b> វិ.ច.ប. បាវិត ខេត្តស្វាយរៀង	Electrician			1	0	8	1	9	1	1	0	0	0	8	1	0	0	0	0	9	1
	Agronomy			1	0	5	1	6	1	0	0	0	0	6	1	0	0	0	0	6	1
	Mechanic					1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0

	Food processing					2	1	2	1	0	0	0	0	2	1	0	0	0	0	2	1
	Total	0	0	2	0	16	3	18	3	1	0	0	0	17	3	0	0	0	0	18	3
5. Preah Norodom Sihakmonny High School, Kampot វិ.ច.ប. ព្រះនរោត្តម សីហមុនី ខេត្តកំពត	Agronomy	0	0	0	0	6	2	6	2	0	0	0	0	5	2	1	0	0	0	6	2
	Aquaculture	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
	Total	0	0	0	0	7	2	7	2	0	0	0	0	6	2	1	0	0	0	7	2
6. Chea Sim Tbey Meanchey high school, Preah Vihear វិ.ច.ប. ជា ស៊ឹម ត្បែងមានជ័យ ខេត្តព្រះវិហារ	Electrician	0	0	2	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	2	0
	Agronomy	0	0	0	0	3	0	3	0	0	0	0	0	3	0	0	0	0	0	3	0
	Aquaculture	0	0	0	0	3	1	3	1	0	0	0	0	3	1	0	0	0	0	3	1
	Total	0	0	2	0	6	1	8	1	2	0	0	0	6	1	0	0	0	0	8	1
7. Hun Sen Pean Chikorng High School, Kampong Cham វិ.ហ៊ុន សែន ពាមជីកង ខេត្តកំពង់ចាម	Electrician					4	1	4	1	1	0			3	1					4	1
	Aquaculture					4	2	4	2					4	2					4	2
	Total	0	0	0	0	8	3	8	3	1	0	0	0	7	3	0	0	0	0	8	3
8. TVET Institute, Tboung Kmom វិ.ស្ថានបណ្តុះបណ្តាលបច្ចេកទេស និងវិជ្ជាជីវៈ ខេត្តក្បួងឃ្មុំ	Agronomy	0	0	0	0	5	1	5	1			0	0	0	0	5	1	0	0	5	1
	Mechanic	0	0	0	0	1	0	1	0			0	0	1	0	0	0	0	0	1	0
	Computer	0	0	0	0	2	0	2	0			0	0	1	0	1	0	0	0	2	0
	Total	0	0	0	0	8	1	8	1	0	0	0	0	2	0	6	1	0	0	8	1
9. Community Development Institute, Kamchay Mear University, Prey Veng វិទ្យាស្ថានអភិវឌ្ឍន៍សហគមន៍នៃសាកលវិទ្យាល័យកំចាយមារ ខេត្តព្រៃវែង	Electronic			2				2	0					2						2	0
	Agronomy			1		2	1	3	1					1		2	1			3	1
	Aquaculture			1				1	0					1						1	0
	Accounting					1		1	0							1				1	0
	Total	0	0	4	0	3	1	7	1	0	0	0	0	4	0	3	1	0	0	7	1

10. Technology Institute, Kampong Speu វិទ្យាស្ថានបច្ចេកវិទ្យា កំពង់ស្ពឺ	Aquaculture	0	0	2	0	5	2	7	2	0	0	0	0	5	1	2	1	0	0	7	2
	Total	0	0	2	0	5	2	7	2	0	0	0	0	5	1	2	1	0	0	7	2
<b>Total</b>		<b>0</b>	<b>0</b>	<b>40</b>	<b>11</b>	<b>82</b>	<b>24</b>	<b>122</b>	<b>35</b>	<b>13</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>104</b>	<b>32</b>	<b>13</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>136</b>	<b>42</b>

ANNEX 7: Status of Staff in Agronomy, Aquaculture, & Food Processing for 2020-2021

No and School name	Technical Staff	Vocational Level								Certificate											
		Primary		Lower Secondary		Upper Secondary		Total	Female	Upper Secondary		Associate's		Bachelor's		Master's		PhD		Total	Female
		Total	Female	Total	Female	Total	Female			Total	Female	Total	Female	Total	Female	Total	Female	Total	Female		
1. Anuwat Kompong Chher Teal High School, Kampong Thom Province វិ.ច.ប.អនុវត្តកំពង់ឆ្នាំងឈើទាល ខេត្តកំពង់ធំ	Agronomy	0	0	5	3	0	0	5	3	0	0	1	1	4	2	0	0	0	0	5	3
	Aquaculture	0	0	10	5	0	0	10	5	0	0	1	1	9	4	0	0	0	0	10	5
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>13</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>8</b>
2. Norodom Sihakmony High School, Kampong Chhnang វិ.ច.ប. ព្រះបាទសម្តេចព្រះបរមនាថ នរោត្តម សីហមុនី ខេត្តកំពង់ឆ្នាំង	Agronomy	0	0	6	2	7	4	13	6	3	1	1	1	9	4	0	0	0	0	13	6
	Aquaculture	0	0	1	0	7	2	8	2	0	0	1	0	7	2	0	0	0	0	8	2
	Food processing	0	0	0	0	4	4	4	4	0	0	0	0	4	4	0	0	0	0	4	4
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>18</b>	<b>10</b>	<b>25</b>	<b>12</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>20</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>12</b>
3. Private Stansorfone, Takeo វិ.ច.ប. ឯកជនសន្តប្រុងស្នួរ ខេត្តតាកែវ	Agronomy	0	0	0	0	0	0	0	0	4	2	0	0	5	2	0	0	0	0	9	4
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>4</b>
4. Bavet High School, Svay Rieng វិ.ច.ប. បាវិត ខេត្តស្វាយរៀង	Agronomy			1	0	5	1	6	1	0	0	0	0	6	1	0	0	0	0	6	1
	Food processing					2	1	2	1	0	0	0	0	2	1	0	0	0	0	2	1
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>2</b>
5. Preah Norodom Sihakmony High School, Kampot វិ.ច.ប. ព្រះនរោត្តម សីហមុនី ខេត្តកំពត	Agronomy	0	0	0	0	6	2	6	2	0	0	0	0	5	2	1	0	0	0	6	2
	Aquaculture	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>2</b>
6. Chea Sim They Meanchey high school, Preah Vihear វិ.ច.ប. ចាមស៊ី ថេយ ម៉េងឆេយ ខេត្តប្រាសាទ	Agronomy	0	0	0	0	3	0	3	0	0	0	0	0	3	0	0	0	0	0	3	0

វិ.ច.ប. ជា ស៊ីម ត្បែងមានជ័យ ខេត្តព្រះវិហារ	Aquaculture	0	0	0	0	3	1	3	1	0	0	0	0	3	1	0	0	0	0	3	1
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>1</b>
7. Hun Sen Pean Chikorng High School, Kampong Cham	Agronomy					4	2	4	2					4	2					4	2
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
ហ៊ុន សែន ពាមជីកង ខេត្តកំពង់ចាម																					
8. TVET Institute, Tboung Kmom វិទ្យាស្ថានបណ្តុះបណ្តាលបច្ចេកទេស និងវិជ្ជាជីវៈ ខេត្តត្បូងឃ្មុំ	Agronomy	0	0	0	0	5	1	5	1			0	0	0	0	5	1	0	0	5	1
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>1</b>
9. Community Development Institute, Kamchay Mear University, Prey Veng វិទ្យាស្ថានអភិវឌ្ឍន៍សហគមន៍នៃសាកលវិទ្យា ល័យកំចាយមារ ខេត្តព្រៃវែង	Agronomy			1		2	1	3	1					1		2	1			3	1
	Aquaculture			1				1	0					1						1	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>
10. Technology Institute, Kampong Speu វិទ្យាស្ថានបច្ចេកវិទ្យា កំពង់ស្ពឺ	Aquaculture	0	0	2	0	5	2	7	2	0	0	0	0	5	1	2	1	0	0	7	2
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>2</b>
<b>Total</b>		<b>0</b>	<b>0</b>	<b>27</b>	<b>10</b>	<b>54</b>	<b>21</b>	<b>81</b>	<b>31</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>69</b>	<b>26</b>	<b>10</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>35</b>

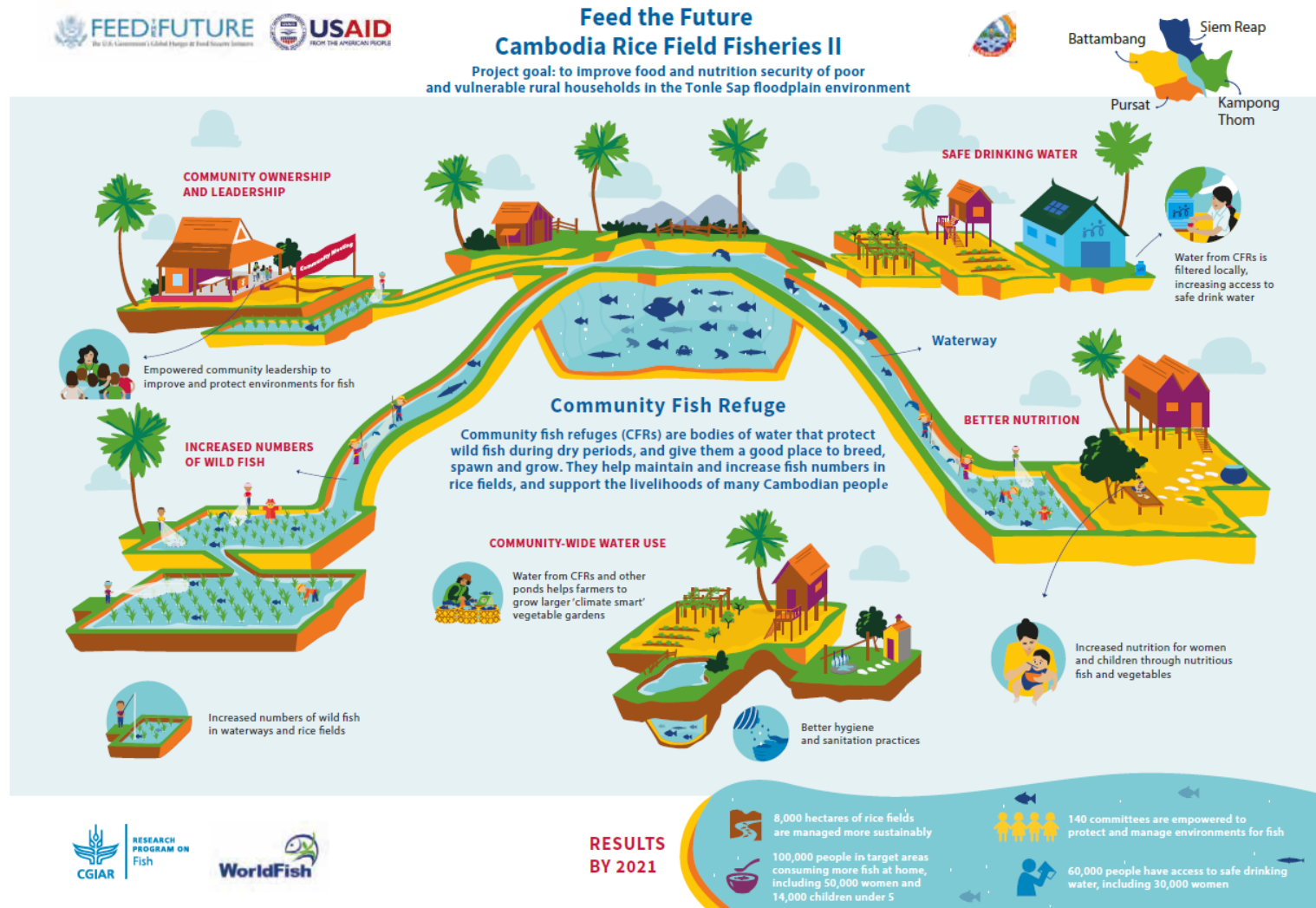
ANNEX 8: Students & Technical Teachers in Agronomy, Aquaculture, & Food Processing for 2021-2022

No and School Name	Major	Number of Students								Number of Teacher	
		Year 1		Year 2		Year 3		Total	Female	Total	Female
		Total	Female	Total	Female	Total	Female				
1. Anuwat Kompong Chher Teal High School, Kampong Thom Province វិ.ច.ប.អនុវត្តកំពង់ឈើទោល ខេត្តកំពង់ធំ	Agronomy	56	29	46	33	33	26	135	88	5	3
	Aquaculture	61	35	50	35	53	42	164	112	10	5
<b>Total</b>		<b>117</b>	<b>64</b>	<b>96</b>	<b>68</b>	<b>86</b>	<b>68</b>	<b>299</b>	<b>200</b>	<b>15</b>	<b>8</b>
2. Norodom Sihakmony High School, Kampong Chhnang វិ.ច.ប.ព្រះបាទសម្តេចព្រះបរមនាថ នរោត្តម សីហមុនី ខេត្តកំពង់ឆ្នាំង	Agronomy	25	16	16	10	14	13	55	39	13	6
	Aquaculture	17	9	10	3	16	6	43	18	8	2
	Food Processing	53	52	36	32	41	36	130	120	4	4
<b>Total</b>		<b>95</b>	<b>77</b>	<b>62</b>	<b>45</b>	<b>71</b>	<b>55</b>	<b>228</b>	<b>177</b>	<b>25</b>	<b>12</b>
3. Private Stansorfone, Takeo វិ.ច.ប. ឯកជនសន្តប្រុងស្ទើរ ខេត្តតាកែវ	Agronomy	21	6	26	8	20	2	67	16	9	4
<b>Total</b>		<b>21</b>	<b>6</b>	<b>26</b>	<b>8</b>	<b>20</b>	<b>2</b>	<b>67</b>	<b>16</b>	<b>9</b>	<b>4</b>
4. Bavet High School, Svay Rieng វិ.ច.ប. បាវិត ខេត្តស្វាយរៀង	Agronomy	17	11	13	8	16	7	46	26	6	1
	Food Processing	12	11	14	9	0	0	26	20	2	1
<b>Total</b>		<b>29</b>	<b>22</b>	<b>27</b>	<b>17</b>	<b>16</b>	<b>7</b>	<b>72</b>	<b>46</b>	<b>8</b>	<b>2</b>
5. Preah Norodom Sihakmonny High School, Kampot	Agronomy	10	4	14	11	20	16	44	31	6	2



វិ.ចប. ព្រះនរោត្តម សីហមុនី ខេត្តកំពត	Aquaculture	11	4	11	3	0	0	22	7	1	0
<b>Total</b>		<b>21</b>	<b>8</b>	<b>25</b>	<b>14</b>	<b>20</b>	<b>16</b>	<b>66</b>	<b>38</b>	<b>7</b>	<b>2</b>
6. Chea Sim Tbey Meanchey high school, Preah Vihear	Agronomy	15	8	23	16	26	18	64	42	3	0
វិ.ចប. ជា ស៊ីម ត្បែងមានជ័យ ខេត្តព្រះវិហារ	Aquaculture	4	1	8	1	0	0	12	2	3	1
<b>Total</b>		<b>19</b>	<b>9</b>	<b>31</b>	<b>17</b>	<b>26</b>	<b>18</b>	<b>76</b>	<b>44</b>	<b>6</b>	<b>1</b>
7. Hun Sen Pean Chikorng High School, Kampong Cham	Agronomy	4	4	32	23	18	15	54	42	4	2
វិ.ហ៊ុន សែន ពាមជីកង ខេត្តកំពង់ចាម											
<b>Total</b>		<b>4</b>	<b>4</b>	<b>32</b>	<b>23</b>	<b>18</b>	<b>15</b>	<b>54</b>	<b>42</b>	<b>4</b>	<b>2</b>
8. TVET Institute, Tboung Kmom	Agronomy	28	18	24	12	8	3	60	33	5	1
វិ.ស្ថានបណ្តុះបណ្តាលបច្ចេកទេស និងវិជ្ជាជីវៈ ខេត្តត្បូងឃ្មុំ											
<b>Total</b>		<b>28</b>	<b>18</b>	<b>24</b>	<b>12</b>	<b>8</b>	<b>3</b>	<b>60</b>	<b>33</b>	<b>5</b>	<b>1</b>
9. Community Development Institute, Kamchay Mear University, Prey Veng	Aquaculture	0	0	9	4	12	7	21	11	1	0
វិទ្យាស្ថានអភិវឌ្ឍន៍សហគមន៍នៃសាកលវិទ្យាល័យកំចាយមារ ខេត្តព្រៃវែង	Agronomy	18	8	39	23	20	12	77	43	3	1
<b>Total</b>		<b>18</b>	<b>8</b>	<b>48</b>	<b>27</b>	<b>32</b>	<b>19</b>	<b>98</b>	<b>54</b>	<b>4</b>	<b>1</b>
10. Technology Institute, Kampong Speu	Aquaculture	19	10	0	0	0	0	19	10	7	2
វិទ្យាស្ថានបច្ចេកវិទ្យា កំពង់ស្ពឺ											
<b>Total</b>		<b>19</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>10</b>	<b>7</b>	<b>2</b>
<b>Total</b>		<b>371</b>	<b>226</b>	<b>371</b>	<b>231</b>	<b>297</b>	<b>203</b>	<b>1039</b>	<b>660</b>	<b>90</b>	<b>35</b>

ANNEX 10: Graphic: Feed the Future Cambodia Rice Field Fisheries II



Source: [https://fish.cgiar.org/wp-content/uploads/2021/12/RFF-II-Infographic\\_English.pdf](https://fish.cgiar.org/wp-content/uploads/2021/12/RFF-II-Infographic_English.pdf)

