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Implementation of Cooperative Training in the Wastewater Sector

Practice Guide



Contents

Abbreviations	4
1. Introduction	1
1.1 Background	1
1.2 Objective	2
1.3 Overview of the cooperative model of vocational training in the sewage sector	3
2. Overall process for the implementation of the cooperative training in the sewage sector	4
Phase I System analysis and networking	4
Phase II Establishment of structures and quality standards	7
Phase III Implementation and sustainability	10
A. Before the training	11
B. During the training	12
C. After the training	13
D. Standardised process for preparation, implementation and evaluation of in-company training phases	15
3. Supporting documents for practice guide (see annex)	18

Abbreviations

BMZ	<i>Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung</i> (Federal Ministry for Economic Cooperation and Development)
CTC1	College of Technical Construction Nr. 1 in Hanoi
DVET	Directorate of Vocational Education and Training
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH</i> (German Society for International Cooperation)
GTAI	Germany Trade and Invest GmbH
HueIC	Hue Industrial College
HVCT	College of Technology II in Ho Chi Minh City
KfW	<i>Kreditanstalt für Wiederaufbau</i> (German state-owned development bank)
MoLISA	Ministry of Labour, Invalids and Social Affairs
MoU	Memorandum of Understanding
NOSS	National Occupational Skills Standard
OS	Occupational Standard
TVET	Technical and Vocational Education and Training
VWSA	Vietnam Water Supply and Sewerage Association (<i>Vietnamesischer Trink- und Abwasserverband</i>)
WW-VT	Wastewater Vocational Training



1. Introduction

1.1 Background

Vietnam's market for environmental technology is growing. The consumption of drinking water in industry and households is increasing, but there is still a lack of wastewater treatment facilities to purify the water used. According to the 'Orientation Plan for Development of Water Sewage and Drainage Systems in Vietnam's Urban Centres and Industrial Parks Leading to 2025 and Vision for 2050', by 2025 all urban settlements should be equipped with centralised systems for collection, transport and treatment of wastewater. The government also wants to strengthen the competences of its own industry. The "Scheme on Development of Vietnam's Environmental Industry by 2025" adopted in February 2017 stipulates that technology and plants from Vietnamese production will account for 70 to 80 percent of total wastewater treatment by 2025 (source: GTAI).

Vocational training plays a central role in this process, as the demand for competent workers is constantly increasing with progressive growth, new professional and technological challenges and with a view to regional and international competitiveness. On the one hand, there is a shortage of skilled workers and technicians, and on the other hand, some 1.4 million people enter the labour market every year. The Vietnamese government has therefore declared employment promotion and vocational training to be its central development policy objectives. By 2020, the proportion of trained workers is to increase from currently 30 to 55 percent. In addition, vocational training is to be geared more closely to the needs of a "green" economy.

Vocational training is at the top of the political agenda in Vietnam, as it has been recognised that the development step from a low wage country to an industrialised country is not possible without the availability of qualified and competent labour for the modern industrial sector. Moreover, vocational training is an important factor for the social development and stability of the country.

German Development Cooperation supports the Government of Viet Nam with the programme for the "Reform of TVET in Vietnam". The programme is implemented on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) by GIZ (technical cooperation) in close cooperation with the Vietnamese Ministry of Labour, Invalids and Social Affairs (MoLISA). Together with the Vietnamese partners, the programme is implementing a comprehensive reform of vocational training introducing new careers and cooperative training schemes. Cooperative training has proven in central European countries such as Germany, Austria and Switzerland to be an excellent instrument to achieve relevance of technical training and to be a successful tool for the natural inclusion of students into productive life.

The programme provides policy and system advice and supports selected vocational training institutes in improving the quality of training and establishing a network of vocational competence centres. With the involvement of the private sector, concepts for regionally compatible vocational training are developed and implemented. Support for technical colleges focuses on the further development of training provision in economically dynamic sectors. The programme is geared to the country's "green" growth strategy. The measures include practical in-service training for teachers and trainers, counselling for school management, adaptation of existing training programmes and development of new ones, as well as the technical update of equipment.

Component 3 "Wastewater Vocational Training (WW-VT)" forms an integral part of the GIZ programme. Its objective is to develop, evaluate and multiply the demand-oriented model of cooperative vocational training in the wastewater sector in Vietnam.

During the period of Phase I from 2014-2018, component 3 organised, coordinated and supported Vietnamese partners in building an Occupational Standard (OS), developing a modular training programme based on the OS, qualifying school teachers and in-company trainers, establishing school and enterprise examiners, as well as implementing the vocational cooperative pilot training programme 'Sewage Engineering Technician'.

The pilot training at college level was conducted at the Ho Chi Minh Vocational College of Technology II (HVCT), with five partner companies and the participation of 22 trainees. After three years of study, 21 trainees graduated from college level (95.5%), of which 17 trainees (accounting for 81%) Obtained a certificate of equivalence to the German standard by the Dresden City Chamber of Industry and Commerce (Sachsen / Dresden) and the Dresden Sewage Company (SEED Dresden).

Based on these achievements, the programme "Reform of TVET in Viet Nam", the Directorate of Vocational Education and Training (DVET) and the Vietnam Water Supply and Sewage Association (VWSA) decided to support HVCT and two additional colleges in the North and Central regions to replicate the cooperative training programme for "Sewage Engineering Technicians". In 2019, these two colleges were selected for the cooperate vocational training: The College of Technical Construction No. 1 in Hanoi (CTC1) and the Industrial College in Hue (HueIC). VWSA assisted the new colleges expanding the cooperative network with the business sector. Five partner companies were identified. For HueIC: Hue Environment and Urban Infrastructure Joint Stock Company (HEPCO), Da Nang Drainage and Wastewater Treatment Company (DDC) and for CTC1: Bac Ninh Sewerage and Wastewater Treatment JSC -WASBACO, Hai Phong Drainage One Member Limited Company, Thai Nguyen Drainage and Urban Infrastructure Development One Member Limited Company. The HVCT continued to cooperate with the wastewater companies UDC, BUSADCO, KHAWASSACO, Cantho Water Supply - Sewerage JTC, BIWASE and Dong Nai.

1.2 Objective

The processes and criteria described in this document amalgamate the experience of the colleges in the implementation of the cooperative training for 'Sewage Engineering Technicians'. Its aim is to present a general outline of the operational and management processes that the various actors in the education and business sectors (college, company, student) must carry out in order to provide the cooperative training, in accordance with the methodology and criteria established for its operation.

It is aimed mainly at actors in the education sector, specifically at TVET institutes that have decided to coordinate and join forces with one or more companies to offer the educational option of cooperative training in the wastewater sector. It also provides valuable information to wastewater companies, who wish to participate in the training that will take place both in the classroom and in the work place.

The document is a road map that will allow the college to organise, carry out, follow up and supervise the fulfilment of all the elements and processes of cooperative training in the wastewater sector, as well as to ensure its correct implementation. For this purpose, it provides templates and standardised procedures thus allowing for an expansion of the cooperative training to other localities in Viet Nam and the region.

It is important to note that this document is complementary to the general concept paper on 'Cooperative Training' by the programme 'Reform of TVET in Viet Nam'. It therefore concentrates on the specific conditions and solutions for the wastewater sector, based upon the overall procedures and regulations for cooperative training in Viet Nam as described in the general concept paper.

1.3 Overview of the cooperative model of vocational training in the sewage sector

The cooperative model of vocational training for Sewage Engineering Technicians comprises training in the company and in the college. The following graph shows the relations between the different key actors in the model.

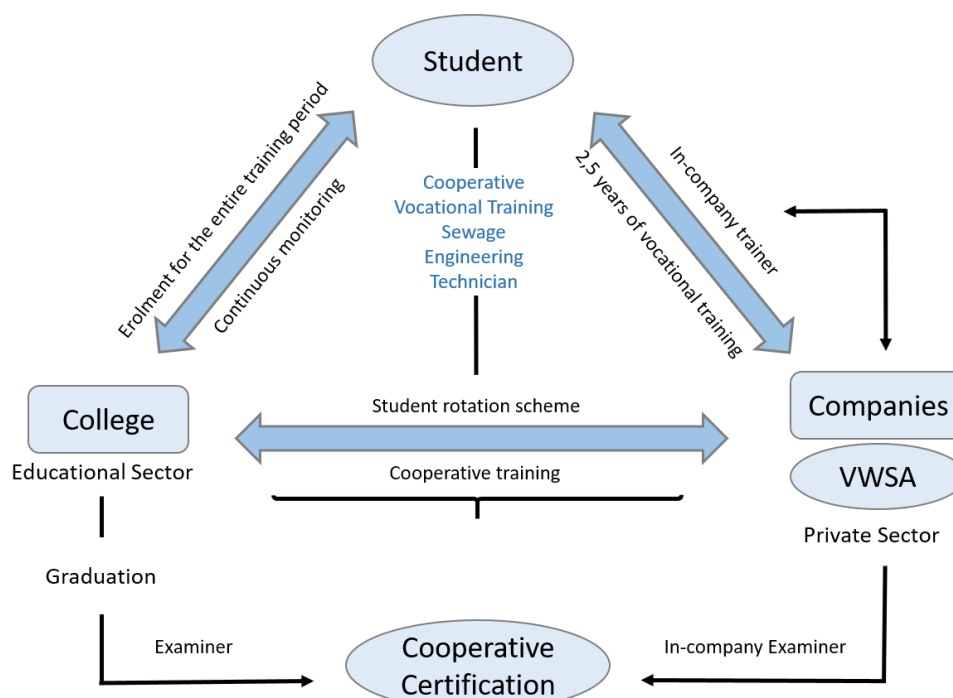


Fig.: 1 Structure of the cooperative model of vocational training in the sewage sector

A distinctive element of the cooperative model in relation to other TVET programmes is the active participation of the productive sector through companies and their organisations with the aim of integral formation of the student. Productive companies actively participate in the training of students in their plants for a determined period of time in close collaboration with the college that does not renounce its commitment to educate the student, above all in his or her basic and propaedeutic formation, in the generic competencies that develop his or her maturity for an adequate incorporation into the company, but also providing the necessary theoretical content that strengthens his or her practical learning in the company. The bases of the cooperative training are embodied in a cooperation agreement between the college and the company, in which the responsibilities of the actors, the period of cooperative training, as well as the existence of the plan for rotation of learning positions are established.

In the following we give a description of the overall process for the implementation of the cooperative training in the sewage sector. The work steps, activities and framework conditions that are required for the analysis and strengthening of TVET for a skilled workforce in the sewage sector introducing an industry-driven cooperative training model are described in their ideal version along with a brief description and the reference to supporting documents. The steps and activities are divided into three phases:



2. Overall process for the implementation of the cooperative training in the sewage sector

Phase I System analysis and networking



The main objective of this first phase of the implementation process is to observe and analyse the situation and the initial context in which the activities are located. The main point is to gather the lessons learned from previous experiences, in order to add value to the implementation. During this phase, the college will work on information tools on the different aspects of the cooperative training, which allow a quick and precise advice to the companies about the cooperative model in the wastewater sector. It is essential to obtain knowledge about the relevant local partners, in order to bring companies together to involve themselves in the cooperative training model. Training that works when companies provide specific practical training, alongside with the colleges that add theoretical content to the training. In the following, we present the work steps of this phase:





Work step	Description	Supporting documents
1 Understand the conceptual foundations of cooperative training in the wastewater sector	A central requirement for the implementation is the availability of colleges and companies to become fully familiar with the concept of cooperative technical training in the wastewater sector. For this purpose, please see the above-mentioned concept paper of GIZ and the supporting documents.	1. MoU Cooperation in TVET for Sewage Engineering Technicians 2. Programme Brochure: Đào tạo hợp tác Kỹ thuật viên Thoát nước và Xử lý nước thải - Mô hình thành công tại Việt Nam. 18. Curriculum Sewage Engineering at College Level VN
2 Know the key actors in the sector	The Directorate for Vocational Education and Training (DVET) is a subordinate agency of the Ministry of Labour, Invalids and Social Affairs (MoLISA), which performs the function of providing MoLISA with advice and assistance in state management and organisation of VET-related nationwide law enforcement as well as management and provision, within its power as prescribed by legal regulations of VET-associated public services. DVET is responsible for approving changes in curricula and regulations and authorising the implementation of a new training programme.	
3 Involve VWSA	The Vietnam Water Supply and Sewerage Association (VWSA) is a social - occupational organisation representing companies, organisations and individuals that together with DVET forms part of the skills council in the wastewater sector. VWSA can support and advice on the implementation of cooperative training programmes for sewage engineering technicians on intermediate and / or college levels, participate in final examinations and train teachers and in-company trainers. VWSA can also foster awareness-raising and image promotion efforts as well as mobilising sewerage companies to offer cooperative training with TVET institutes.	
4 Benefit from the experience of HVCT	HVCT is one of the key educational institutions, implementing the vocational training program on Sewage Engineering Technicians in accordance with German standards. The college acts as competence centre for the implementation of the cooperative vocational training model in the wastewater sector by providing short training courses to lecturers from other vocational training institutions or technical staff of wastewater and wastewater treatment enterprises under the Ministry of Labour, War Invalids and Social Affairs (MOLISA)	
5 Relate to the sewage sector skills council	The sewage sector skills council is composed of representatives of DVET/MoLISA and VWSA. It works on improving occupational skills of technical trainees and workers in the sewage sector with the aim to meet the labour market's demand and approach international standards, by replicating and institutionalising the industry-driven cooperative training model.	
6 Analyse the possibilities to implement cooperate technical training in the wastewater sector at local level.	The local VET system and its actors should be analysed to determine whether there are points of connecting factors for the introduction of cooperative technical training in the wastewater sector, as well as impediments.	3. Contract for In-Company Training
7 Analyse the local conditions	Existing experiences of other colleges and specific regional sectoral conditions should be evaluated. The elements to consider, among others, are: - Equipment check available resources - Teacher qualifications	



Work step		Description	Supporting documents
		<ul style="list-style-type: none"> - Cost situation - Methodical/educational concept - Technological level of companies 	
8	Engage companies	A key element of the cooperative model is the active participation of sewage companies in the training of sewage engineering technicians. It is therefore important that colleges have a strong network of local public and private wastewater companies, which is the precondition for ensuring successful in-company training phases.	
9	Register the new vocational training programme with DVET	According to the Vietnamese regulations new vocational training occupations have to be registered at DVET according to the different levels specified in Decree 143/2016-NĐ-CP (chapter 3).	Decree 143/2016- NĐ-CP (Chapter III): https://thuvienphapluat.vn/van-ban/Dau-tu/Decree-143-2016-ND-CP-on-investment-and-operation-in-vocational-education-329326.aspx?tab=1 (VN)
10	Design and implement an operational plan	It is important to plan the necessary operational steps to implement the training programme for Sewage Engineering Technicians. For this purpose, an operational plan is set up that includes measures to disseminate the training programme, to facilitate the generation of alliances and membership of partners and to prepare the necessary framework conditions like infrastructure, qualification of staff, equipment etc.	
11	Perform PR activities	In order to achieve a better positioning as a continuous and reliable training provider for WW-VT, it is relevant to perform PR activities. The PR activities aim at facilitating the generation of alliances and adhesion of partners and the enrolment of students addressing parents and the students themselves. With this aim, it is suggested to carry out the following actions:	
11.1	Design a marketing and communication plan	Prepare a marketing and communication plan determining key messages, suitable dates, media and target groups. Since the image of the sewage sector is not so positive, and consequently it is hard to attract young people to jobs in this field we recommend to carefully prepare a successful marketing campaign. Sewage companies are ready to support with open days and field visits.	
11.2	Produce publications	In order to reach the relevant local target groups, it is recommended to publish meaningful and target group-oriented publications like articles, brochures etc. (see supporting documents for examples) on the cooperative model of vocational training in the sewage sector. If necessary, various formats should be adapted for the different target groups.	4. Flyer HVCT EN 5. Flyer HVCT VN 2. Programme Brochure 6. Brochure View 7. Standee HueIC Anh-Viet • Several Videos
11.3	Launch the training for Sewage Engineering Technicians	To start the activities, it is advisable to organise a suitable kick-off event that achieves an optimal result of public visibility.	
11.4	Disseminate the ongoing projects	Periodically report on ongoing projects in the appropriate media.	8. Newsletter Bản tin số 9 - Đào tạo nghề cho Xử lý nước thải

Phase II Establishment of structures and quality standards



Once the analysis of the situation and the general context has been carried out, in this phase of the overall process the necessary structures will be established to start the implementation of the cooperative training in the wastewater sector. It is necessary for the colleges to meet regularly with companies and experts so that they can share their knowledge. A space is needed where an exchange of information takes place, where the demand for technical training and changes in the labour market are discussed, common concepts are elaborated and training plans are developed or adapted. The cooperative model requires that organisational and implementation plans are developed to facilitate the interlinking of the two training locations college and company. It is important to introduce quality criteria to offer all companies procedures and structures, with high recognition value. In the following we give a brief description of the work steps of this phase:





Work step	Description	Supporting documents
1 Check resources of colleges	<p>The capacity of colleges to successfully implement the training programme for sewage engineering technicians is checked with the annexed guidelines and quality criteria. They focus above all on</p> <ul style="list-style-type: none"> • Employment-relevance of training: geared towards training demand, high proportion of practical training, development of workplace-related competences; cooperation with industry • Financial self-sustainability: Sufficient funds to recover current costs, re-investments and pay-back of loans. • Competence level of personnel: practical work experience and training competence of teaching staff, management experience of management staff. • Organisational set-up and efficiency: appropriate organisational structure and staffing concept, workshop organisation, maintenance, external relationships, etc. <p>In this context, it is important to evaluate the existing training equipment and to categorise materials that have to be completed (see examples of lists of equipment).</p>	9. Guideline and Promotion of TVET Institutes based on Criteria 10. Equipment DE XUAT THIET BI PTN & XTH 11. Equipment DE XUAT THIET BI XUONG DIEN
2 Check companies willing to commit	<p>Only if good training conditions are in place a high-quality implementation of the cooperative model for skilled workforce in the sewage sector can be ensured. As a rule, the suitability of a training company must be checked before the training begins. In addition, it makes sense to check the suitability again during the training, e.g. by a short visit to the company. The quality check of companies comprises the qualification of staff, technical equipment, but also the management of the company. For a company to be able to offer vocational training implies at least:</p> <ul style="list-style-type: none"> • to dispose of sufficient space for the in- company training and the appropriate work equipment • to be able to visualise the work processes required for the vocational training • to respect human rights, not to allow any discrimination, and to protect the personal sphere of the individual • to abide governing working hours, occupational safety and health protection and to offer fair remuneration <p>It is recommended to elaborate a quality check as a task of the advisory board.</p>	
3 Ensure quality of human resources	<p>Qualified in-company trainers are a key element of the cooperative model in the sewage sector. The company has the task of ensuring this qualification and must plan and execute the corresponding further trainings. In-company trainers should dispose of the necessary personal and technical skills to work in the training of young people. To this end, apart from solid technical experience, also pedagogical skills are required. One option for achieving pedagogical competence is to successfully complete the "Training of Trainers" course and obtain a certification according to German quality standards (AEVO). The "Manual for In-Company Trainers" is accompanying material to the course and describes the contents in Vietnamese (see document 12 in the annex). For the upskilling of technical competence, a number of technical short courses were set up by Stadtentwässerung Dresden (see overview 13). They are offered by master trainers of VWSA and HVCT for the operating and teaching staff (see MoU). Technical skills of school teachers and in-company trainers are determined by the requirements of the vocational training programme.</p>	12. Manual for Training of In-Company Trainers VN 13. Overview of Technical Short Courses 14. MoU between HVCT and VWSA VN



Work step	Description	Supporting documents
<p>4</p> <p>Establish an Advisory Board</p>	<p>The advisory boards are aimed at building cooperation among stakeholders to continuously improve the quality of vocational training for sewage engineering technicians at intermediate or college level. In alignment with the German dual apprenticeship system, the role of the advisory boards is to link colleges, employers, associations, trade unions and the Vietnamese-German programme Reform of TVET in Vietnam.</p> <p>The work of advisory boards aims to:</p> <ul style="list-style-type: none"> • establish close cooperation and relationships for mutual benefits in the WW-VT compiling and editing curricula, teaching and learning materials • design and implement in-company training / internship • support implementation of cooperative training, address training and work practice • raise, mobilise socialisation, support training funding • establish a partnership between the trainees and the company • deliver employment support for graduates • design and implement advanced training courses for technical staff of enterprises • promote participation of the business sector in the process of exam / evaluation of training results • support career orientation and improve the image of vocational education, for example, performing skills competitions, admission dates, etc. <p>The collaboration in the cooperative training model underpinned by the joint work in the advisory boards creates a win-win-situation. College and companies profit from each other. The companies provide training places and receive training courses for their employees. For further details see supporting documents.</p>	<p>15. Advisory Council Constitution (HueIC)</p> <p>16. Regulation on Operation of the Advisory Council CTC1</p> <p>17. Cooperative Agreement on the Establishment and Operation of the Advisory Board (HVCT)</p>
<p>5</p> <p>Assign cooperative training coordinators responsible for the cooperative training</p>	<p>Assign cooperative training coordinators with technical competence for the cooperative technical training who should network in the college to ensure optimal cooperation with the areas of service provision, partner activities, databases, events. This person works like a liaison officer and is responsible for the technical training in the company and vice versa. The objective is to develop a permanent range of services related to the cooperative training for the affiliated companies.</p>	
<p>6</p> <p>Develop a procedure for the review or adaptation of curricula</p>	<p>It is usually necessary to adapt the curricula especially when there are updates to the locally existing conditions and technological innovation, and according to specialisation. Adaptation processes should not be carried out randomly, but in a coordinated manner and with quality assurance. The basis for the review/adaptation is a process description, which should be established locally. A curricular framework (curriculum) should be discussed in the advisory board and developed together with the technical college, based on the contents of the training regulations.</p>	<p>18. Curriculum Sewage Engineering at College level VN</p> <p>19. Curriculum Sewage Engineering at Intermediate Level VN</p> <p>20. Curriculum Sewage Engineering from Intermediate to College Level VN</p>

Phase III Implementation and sustainability



The aim of this phase is to ensure sustainability in the implementation and operation of the cooperative technical training in the sewage sector. To this end, all steps of training must be described and planned, taking into consideration the aspects of time and content. Furthermore, the professional and personal aptitude of teachers and in-company trainers to transmit the professional contents and the suitability of the training company in terms of space and equipment must be ensured. In this phase four sub-processes are described: Before, during and after the cooperative vocational training and as a special process the in-company training phases.





A. Before the training		
Work step	Description	Supporting documents
1	<p>Develop a detailed implementation plan, including schedule, budget, staffing requirements, costs</p> <p>The implementation of the cooperative training must be conceived, planned and calculated for the entire training period, taking into consideration the aspects of time, staff and finances.</p>	
2	<p>Recruit trainees</p> <p>As in many other neighbouring countries in Viet Nam, TVET is often regarded as the second choice after university education, which results in a low enrolment rate in TVET institutes. To attract young people to the sewage sector poses a particular challenge. Therefore, make use of all the marketing materials available, involve companies in the sector, and organise 'Open days' to promote TVET as a career option to high school students. Open Days can be a powerful instrument to change students', parents' and teachers' perceptions towards TVET. A tour of the school can provide them with an opportunity to experience the school's practical learning environment including wastewater workshop, academic building, study spaces and laboratory facilities. Besides, a round table with the business sector is valuable to provide young students a clearer image of their future working fields.</p> <p>However, not only bring high school students to the college, but also try to reach through onsite events. Visit high schools and Education Centres to introduce the training for Sewage Engineering Technician directly to the target group of 15 to 18-year olds. With interactive and informative activities and stories from successful TVET graduates, young people, parents and teachers understand more about the career of a sewage engineering technician. A two-minute video has been produced to showcase a typical working day of a sewage engineering technician. In the video, following young technicians in their daily tasks, audiences can observe the actual working conditions of wastewater sector in Viet Nam. Above all, the video demonstrates the pride of the technicians who choose a career as a sewage engineering technician. Field visits to wastewater companies can also help to attract students to the career.</p>	<p>4. Flyer HVCT EN</p> <p>5. Flyer HVCT VN</p> <p>2. Programme Brochure</p> <p>6. Brochure View</p> <p>7. Standee HueIC Anh-Viet</p> <p>8. Newsletter Bản tin số 9 - Đào tạo nghề cho Xử lý nước thải</p> <p>- Several Videos</p>
3	<p>Enrol trainees</p> <p>Trainees are enrolled according to the regulations of the college. Besides, it is recommended to conclude training contracts between college, enterprise and the trainees assigned to the enterprise.</p>	



B. During the training

Work step	Description	Supporting documents
1	<p>Develop an in-company training rotation plan</p> <p>College and company jointly prepare the in-company training phase for each student based on the training regulations and the training curriculum framework. The implementation plan must be adapted to the special conditions that exist in the company. The plan defines the functional and chronological structure of training for the company and the student. The existing implementation plan of in-company training (see supporting document 19) must be adapted to local conditions and needs. For further details see chapter D.</p>	<p>3. Contract for In-Company Training</p> <p>21. Implementation Plan of In-Company Training</p> <p>22. Workbook for all In-Company Training Modules</p> <p>23. Minutes of Meeting Preparing In-Company Training Phase</p>
2	<p>Organise the monitoring of the training in the company</p> <p>The companies and the colleges must monitor the training. This is done in particular by reviewing the suitability of the companies and the competence of in-company trainers, by tracking student's progress using the training diary and the feedback sheets and by regular visits to the companies, including meetings with the persons involved.</p> <p>Monitoring systems register number of trainees, number of training days for theoretical and practical modules, performance indicators etc. Besides the standard monitoring and evaluation instruments of the college, for the cooperative model some additional instruments have been developed. It is recommended to make use of these ready-made templates and to adjust them for individual needs if necessary. The learning progress of trainees and their performance are primarily recorded by the following three central documents:</p> <p>Training diary: to be maintained by the trainee. Besides documenting any difficulty or highlight in the learning process, the training diary is also an important tool for reflection. By reflecting and evaluating the learning progress made, the trainee gains consciousness of the advancements and consequently motivation. The training diary is countersigned by the 'in-company trainer' and the TVET institute's teacher.</p> <p>Feedback from trainee: The feedback sheet is another tool for reflection and focuses more on the emotional side</p> <p>Assessment after In-Company Training Phase: This sheet serves the evaluation of student's performance by the in-company trainer. It is signed by the in-company trainer and the student.</p>	<p>24. Training Diary</p> <p>25. Feedback from Trainee</p> <p>26. Assessment after In-Company Training Phase</p>
3	<p>Accompany and support companies to maintain quality level</p> <p>This is done in particular by checking whether the companies and the in-company trainers maintain the quality level of training on a permanent basis. For this purpose, regular visits to companies are recommended. The college must draw up a plan for visits and support which is defined by the situation in the training companies. During the visits, the enterprises should be consulted on training-related aspects, with regular inspection of the training diaries and feedback sheets of trainees. The aim is to ensure that the training is carried out on the basis of jointly defined quality standards.</p>	<p>24. Training Diary</p> <p>25. Feedback from Trainee</p> <p>26. Assessment after In-Company Training Phase</p>



C. After the training

Work step		Description	Supporting documents
1	Prepare trainees for periodic and/or final exams	Once the list of trainees taking the exam has been verified, and in relation to the skills to be evaluated, a preparation programme for the exams, whether periodic or final, must be drawn up. The programme should take into account the theoretical and practical parts of the exam and simulate real evaluation situations.	
2	Prepare exam at college	The students take their graduation exam according to the regulations of the college and in accordance with the standards of MoLISA/DVET. A periodic or final exam consists of theoretical and practical parts, in which the participation of an examiner from the business sector is a precondition. Teachers and trainers produce a bank of exam questions for periodic or final exams.	
3	Award formal certification	After a successful graduation examination, the formal certification of the qualification in accordance with circular 10/2017/TT-BLDTBXH amended by circular 34/2018/TT-BLDTXH on granting college and intermediate degrees takes place. The TVET institute has the authority to assess and certify that the graduate has successfully passed the graduation examination.	
4	Prepare practical joint assessment	According to the philosophy of the cooperative model, college and company not only share the responsibility for the training but also for the assessment of the training process and the learning outcomes. A final assessment should be performed within the framework of the agreed requirements on skills, knowledge and attitudes agreed by the college and business sector (reflected in the DACUM chart) for the sewage engineering technician. The practical assessment should <ul style="list-style-type: none"> • be accepted by the business community • allow for the assessment of the performance in a differentiated way • be neutral, independent, fair, recognised and uniform In order to guarantee this, the learning outcomes (LO) developed according to circular 56/2018/TT-BLDTBXH on minimum knowledge amount and required competences for learners upon graduation of the intermediate and college qualification level in water treatment as well as the DACUM chart developed in cooperation with the business sector should be the points of reference for the assessment and certification system. This means: <ul style="list-style-type: none"> • The subjects of the examination are occupational skills, which are defined in the learning outcomes. • An examination must be able to reproduce the characteristic requirements of professional practice 	
4.1	Appoint examiners	The examiners must be recognized by the business community. They should have mastered those occupational skills defined in the NOSS that are assigned to their examination areas. Assign staff from both college and the enterprise(s) to participate in the teams for assessing and scoring the practical skills examination. Experiences from the pilot in the wastewater field have shown, that this role is best taken-up by TVET institutes' teachers and in-company trainers that obtained specific training as examiners. A group of examiners has been prepared and is available to execute the practical exams (see 27 Examiner Certificate DE_VN).	27. Examiner Certificate DE_VN



C. After the training

Work step	Description	Supporting documents
4.2 Execute cooperative examination	<p>Since evidence is required that the students are competent in their specialty, the final exam is applied with highly practical content integrating the following:</p> <ul style="list-style-type: none"> • Ability to solve the problem • Ability to coordinate with an internal supplier • Ability to coordinate with an internal customer • Planning, order and systematic methodology applied in the work • Knowledge of theoretical foundations • Documentation of the work executed • Time spent on the task • Attitude and aptitude of the student for and towards work <p>Numerous practical assignments, task sheets, protocols and assessment sheets are available (see examples in the supporting documents).</p>	<p>28. Overall Assessment Sheet Practical Exam VN DE</p> <p>29. Attestation of Examination Result VN DE</p> <p>30. Attestation of Examination Partial Results DE VN</p> <p>31. Protocol Practical Exam VN DE</p> <p>32. Protocol Written Exam VN DE</p> <p>33. Task Sheet Maintenance VN</p> <p>34. Assessment Sheet Maintenance VN</p> <p>35. Task sheet Power Unit VN</p> <p>36. Assessment Sheet Power unit VN</p> <p>37. Task sheet Sewer Entry VN</p> <p>38. Assessment Sheet Sewer Entry VN</p> <p>39. Task Sheet Typical Parameter VN</p> <p>40. Assessment Sheet Typical Parameter VN</p>
4.4 Recognise cooperative examination	<p>It may be advisable to additionally involve VWSA in the certification process. Thereby it would be confirmed that the training programme and respective examination has been implemented in consent with the business sector. It is also recommended that, DVET and relevant line ministries should consider mechanisms to align cooperative training certification based on LO with the NOSS qualification in the respective occupation. This would increase the potential recognition of cooperative training regionally and internationally.</p> <p>In the case of the 'Sewage Engineering Technician' the German Chamber of Industry and Trade of Dresden, a responsible German body, has confirmed the equivalence to the German standard.</p>	
5 Accompany the process of labor integration	Generate a fluid coordination with the business to support graduates in finding a job. Follow up on the cohort of graduates each year.	
6 Maintain an updated database of alumni	Maintain up-to-date records of trainees completing the dual technical-vocational training at the high school.	



D. Standardised process for preparation, implementation and evaluation of in-company training phases

The tasks described in the following process are applicable to all in-company training phases. Timelines can be defined flexibly in each specific phase, but not earlier or later than two weeks as required in the process.

Note: Tasks of in-company trainers are highlighted in blue for better follow-up.

	Work step	Person in charge	Timetable	Notes and supporting documents
General Preparation	Ask the company for the time preferences for the all in-company training phases of the coming training year	Dean of faculty/ coordinator of college	2 weeks before the end of the 2 nd term of the school year	Contact the in-company trainer in advance for their production/activity plan to identify the best time to conduct the training modules in the company.
	Contact for confirmation of timing for in-company training phases with training the coordinator of the company	Dean of faculty Teacher - coordinator of college	The last week of the 2 nd term of the school year at the latest	Mrs.- Company A, Mrs.- Company B, Mrs.- Company C (Communication is carried out in written form e.g. by emails in order to document the time planning from the companies)
	Do the time planning for the college - and in-company training phases for the coming term and send it to the department of training	Dean of faculty	The last week of the 2 nd term of the school year at the latest.	Based on the time schedule with the coordinator from the company
	Collect the exams' marks for all college-modules	Teachers	Soon as completion of all the exams of the 2 nd term	The marks will be indicated in the attached annex of the official letter to the company (see the annex)
	Organise trainees' meeting	Dean of faculty	Before the holiday	Meeting for final review of the school year, and cross-check of the trainees' health and accident insurance, work safety equipment;)
Before In-Company Training	Divide trainees in groups for in-company training	Dean of faculty	In the first two weeks of the term	Swap the groups, mix between good trainees, average and weak ones. Ensure the trainees to have chances of practical training in several companies. Possibly support trainees by organising transport and accommodation near the training places before the first in-company training phase
	Send the official letters to companies (mailing + fax + email (file scan) – Deadline for provision of feedback to be at least 4 weeks before starting the in-company training phase)	Dean of the faculty	At least 8 weeks before starting the in-company training phase	The contents of the official letter should clearly indicate the place, the timing, modules (including the training hours), the in-charge teachers and trainees lists, attached with trainees' transcripts as an annex. Email should address both to company's leadership and the coordinator. (See template of the official letter and the Annex)
	Follow-up the feedback from the company, remind the coordinator of the company	Dean of the faculty/ coordinator of college	At least 5 weeks before start	To cross-check with the company for the feedback letter



D. Standardised process for preparation, implementation and evaluation of in-company training phases

The tasks described in the following process are applicable to all in-company training phases. Timelines can be defined flexibly in each specific phase, but not earlier or later than two weeks as required in the process.

Note: Tasks of in-company trainers are highlighted in blue for better follow-up.

	Work step	Person in charge	Timetable	Notes and supporting documents
Before In-Company Training	Exchange information of the modules during each in-company training phase	Teacher/ in-company trainers	On receipt of the feedback from the company	The teacher in-charge will consult with the in- company trainers for supportive information
	Review of the knowledge and contents delivered during the previous in-company training phases which relates to the coming in-company modules	Teacher/ in-company trainers	At least three weeks before start	The communication about the training contents between in-company trainers will help to avoid the repetition of the knowledge delivered to the trainees (Email-request for confirmation)
	Review of the knowledge and contents delivered during the previous in-college phase which relates to the coming in-company modules	Teacher	At least three weeks before start	The content has to be the same to all the trainee groups. Send to in-company trainers (<i>Email- request for confirmation</i>)
	Information for making detailed training schedule	Teacher	At least two weeks before start	After sending information (as indicated 2.5 and 2.6), further explanation should be provided to the in-company trainers about the knowledge that were already delivered to trainees at the college and during the previous in-company training phases in other companies. (<i>Call for cross-check</i>)
	Make the detailed training schedule and send it to the faculty	In-company trainer	At least one week before start	Contact persons from companies (....-Com. A,-Com. B,-Com. C) send to dean of faculty/ coordinator of college. (<i>Email - request for confirmation</i>)
	Review of instruction materials based on the training plan	In-company trainer	At least one week before start	Based on the training plan and the contents delivered to trainees in the previous in-company training phases
	Meeting with trainees before start	Dean of the faculty/ coordinator of college	At least one week before start	To announce the information about the coming in-company training phase including timetables, place, regulations and requirements of the college and company To review the health and accident insurance of the trainees, safety equipment, name tags Check the logistical preparation including accommodation, traveling options for trainees that have to go to other provinces (Cần Thơ, Vũng Tàu), if needed.
	Contact persons from companies prepare printings of the training materials, blank table sheet for filling on weekly basis and trainee assessment sheets.	In-company trainer	At least one week before start	Make sure there are sufficient copies for the trainees in the respectively required weeks (<i>the template for weekly training diary</i>)



D. Standardised process for preparation, implementation and evaluation of in-company training phases

The tasks described in the following process are applicable to all in-company training phases. Timelines can be defined flexibly in each specific phase, but not earlier or later than two weeks as required in the process.

Note: Tasks of in-company trainers are highlighted in blue for better follow-up.

	Work step	Person in charge	Timetable	Notes and supporting documents
During In-Company Training	Accompany the trainees to where the in-company training will take place, needed for the first time	Teacher	The first day	To be applicable to the first or second time. The availability of accompanied trainer for the next phases will be optional, depending on specific conditions: trainee groups and location of the companies
	Provide guidance for the trainees Request the trainees to fill in the weekly training diary at the company	In-company trainer	During the time	The contents which are missed during the current training phase due to a change in the production plan, will be noted down for the next phase
	Communication between the teachers and the in-company trainers will be carried out on a regular basis to follow up the current in-company training phase	Teacher/ Training Coordinator of the company	During the time	The knowledge to be delivered at the company should be followed closely by the responsible teachers for possible support, if needed. During the first and second phase, this should be carried on a weekly basis
	Test to end up the whole phase Check the training diaries at the company, trainees' assessment sheets including all the required information and signatures	In-company trainer	The last week	The test should be organised after finishing one module or at the end of the whole phase (See the template training diary and assessment sheets)
	Collect test sheets, training diaries, assessment sheets	Teacher	The week after the in-company training phase	Fully filled forms, sheets with signatures
After In-Company Training	Collect the test results of all trainees from the last in-company training phase. Hand over all test sheets, weekly training diaries, trainee assessment sheets to college management	Teacher	The week after the in-company training phase	The results of the in-company training phase will be attached in the annex of the official letter sent to company (<i>See the annex</i>)
	Group reports by the trainees	Trainee Teacher Dean	One or two weeks after the internship	Practical contents related to training modules will be noted by the teacher; dean delivers final remarks
	Teachers and in-company trainers conduct the final review of the last in-company training phase	Teacher/ contact person of company	The 2 nd -4 th week after the in-company training phase	Meeting in person or communication on phone to withdraw lessons learnt and develop the content for the next in-company training phase. (<i>email for confirmation</i>)

3. Supporting documents for practice guide (see annex)

The following documents are considered as essential documents to be applied while implementing the cooperative training model.

No.	Documents	Page
Introductory documents		
1	MoU Cooperation in TVET for Sewage Engineering Technicians MoU between DVET/MoLISA, VWSA and GIZ to continue and strengthen the cooperative training in the sewage sector	01-12
2	Programme Brochure Đào tạo hợp tác Kỹ thuật viên Thoát nước và Xử lý nước thải - Mô hình thành công tại Việt Nam	13-32
3	Contract for In-Company Training specific agreement between college and each enterprise to be concluded for all in-company training phases	34-36
Marketing Material		
4	Flyer HVCT EN advertising flyer informing about the vocational training for sewage engineering technicians and job opportunities in English	37-38
5	Flyer HVCT VN same flyer in Vietnamese	39-40
6	Brochure View marketing brochure informing about the technical fields of activity of a sewage technician	41-64
7	Standee HueIC Anh-Viet advertising Material for roll-ups with statements for graduated sewage engineering technicians in Vietnam	65-66
8	Newsletter Bản tin số 9 - Đào tạo nghề cho Xử lý nước thải example for the marketing of training activities in the sewage sector published by DVET, HVCT and GIZ in Vietnamese	67-72
Quality criteria and infrastructure		
9	9 Guideline and Promotion of TVET Institutes based on Criteria guideline describing the selection criteria for colleges willing to execute employment-related training programmes in cooperation with the industry	73-85
10	Equipment DE XUAT THIET BI PTN & XTH equipment list for the laboratory and the mechanical workshop for the implementation of the vocational training for sewage engineering technicians	86-107
11	Equipment DE XUAT THIET BI XUONG DIEN equipment list for the electrical workshop for the implementation of the vocational training for sewage engineering technicians	108-114
Training of teachers and in-company trainers		
12	Manual for Training of In-Company Trainers VN supporting learning material for the qualification of in-company trainers	115-136
13	Overview of Technical Short Courses overview of technical short courses that can be conducted by master trainers for the qualification of teachers and in-company trainers	137
14	MoU between HVCT and VWSA VN MoU to cooperate in key areas to strengthen the implementation of the cooperative vocational training in the sewage sector.	138-143
Advisory board		
15	Advisory Council Constitution (HueIC) example for the constitution of an advisory board at college level	144-145
16	Regulation on Operation of the Advisory Council CTC1 regulation prescribing the organization and operation of the Advisory Council of the Sewage Engineering Technician Department of Construction College No. 1	146-148
17	Cooperative Agreement on the Establishment and Operation of the Advisory Board (HVCT) regulation prescribing the organization and operation of the advisory board of the Sewage Engineering Technician Department	149-157

Curricula		
18	Curriculum Sewage Engineering at College Level VN curriculum describing objectives, subjects, modular structure and distribution of time	158-395
19	Curriculum Sewage Engineering at Intermediate Level VN curriculum describing objectives, subjects, modular structure and distribution of time	396-573
20	Curriculum Sewage Engineering from Intermediate to College Level VN curriculum describing objectives, subjects, modular structure and distribution of time	574-728
Instruments for Conducting In-Company Training Phases		
21	Implementation Plan of In-Company Training to be developed for all in-company training phases by the in-company trainers for each company, based on the curriculum	729-745
22	Workbook for all In-Company Training Modules workbook for each in-company training module to be developed by in-company trainers for each company	746-749
23	Minutes of Meeting Preparing in-Company Training Phase meeting of in-company trainers and college teachers for exchanging information and lessons learnt to be conducted before an in-company training phase.	750-752
M&E Instruments		
24	Training Diary to be kept by the student during college and in-company training phases. The training diary is complemented by an analysis of the training process and results achieved, to be countersigned by the in-company trainers and the college teacher	753-756
25	Feedback from Trainee questionnaire for evaluation of the in-company training and college Phases to be filled in by trainees	757-758
26	Assessment after In-Company Training Phase Questionnaire for evaluation of the in-company training phase to be filled in the in-company trainer and signed by the student	759-760
Practical examination and certification		
27	Examiner Certificate DE VN certificate confirming the nomination of a person as examiner	761-762
28	Overall Assessment Sheet Practical Exam VN DE displays the evaluation results of the individual parts/tasks of the practical exam	763
29	Attestation of Examination Result VN DE confirms that the exam was passed or failed	764
30	Attestation of Examination Partial Results DE VN states the individual results of the written and practical exam	765-766
31	Protocol Practical Exam VN DE records the execution of the practical exam	767-768
32	Protocol Written Exam VN DE records the execution of the written exam	769-771
33	Task Sheet Maintenance VN task sheet for the testing of the subject maintenance	772
34	Assessment Sheet Maintenance VN assessment sheet for the testing of the subject maintenance	773-774
35	Task Sheet Power Unit VN task sheet for the testing of the subject power unit	775
36	Assessment Sheet Power Unit VN assessment sheet for the testing of the subject power unit	776-777
37	Task Sheet Sewer Entry VN task sheet for the testing of the subject sewer entry	778
38	Assessment Sheet Sewer entry VN assessment sheet for the testing of the subject sewer entry	779-781
39	Task Sheet Typical Parameter VN task sheet for the determination of typical parameters of the treatment plant	782
40	Assessment Sheet Typical Parameter VN assessment sheet for determination of typical parameters of the treatment plant	783-784