

Professional development of water engineers, policy makers and technicians

Introduction

The Dutch water sector has proven to be a qualitative and trustful sector. The companies and institutions pay a lot of attention to technical as well as professional development of the staff. The professional development is organised for all levels, on academic, on lower, intermediate and higher vocational level. The institutions spend yearly approximately 2% of their personnel budget on education and development of the staff. Mostly the education programmes are external organised and diploma oriented.

SWO (short for Stichting Wateropleidingen) is the training institute for water management. Established in 1993 by the Dutch water sector in order to improve the quality of their employees with specific focus on water issues.

History

Since the fifties (1950-1970) the number of water companies increased and up to 99% of the houses were connected to the water supply network. In the environmental decennia (1970-1980) the environmental pollution was really an item and the interest for water related issues grew. The Clean Water Act (1970) was the trigger to collect the waste water and to establish waste water treatment plants. Around 1965-1975 the operating and maintenance of the plants was reserved to the engineers. The Technical Universities programmed studies on water supply, sanitation and water treatment. The water engineers associated themselves in a professional Water Association to exchange knowledge and experience. The engineers were very enthusiastic in sharing their knowledge. Studies on vocational level were general and not applied to the specific needs of the water sector. After the engineers built the (waste) water treatment plant, they stuck to operating and maintenance and the experienced a lack in technological knowledge on practical and vocational level. The Water Association organised training programmes for the employees of the water plants, based on the concept “for professionals, by professionals”. The interest for the training activities grew and in 1993 they reached the step of establishing a professional training centre. So an independent foundation was set up to organise all professional water education in the Netherlands.

SWO: broad experience in the water sector

SWO (short for Stichting Wateropleidingen) is a training institute for water management. Established in 1993 by the Dutch water sector in order to improve the quality of their employees with specific knowledge on water issues, SWO built up a broad experience. SWO offers very practical courses for all water related issues. Each year about two thousand employees working in the water sector participate in one or more of the eighty education programs and courses.



The SWO-concept

Both in the Netherlands and abroad, SWO offers training for all kinds of “water workers” on different levels in the water sector. Our courses are always up-to-date, directly related to daily practise. SWO is focussed on courses on all vocational levels. The courses and education programmes are based on the SWO-concept. During 15 years the SWO-concept has been developed and improved; the training centre is ISO-9001 certified since 1998.

The SWO-concept:

- training for professionals by professionals
- inspiring and practical courses, tailored to you
- not-for-profit, not-for-loss

Training for professionals by professionals

The first aspect of the unique concept of SWO is that the participants are trained by professionals from the water sector itself. About 250 teachers are available on a freelance basis for all types of courses, be it technical, financial, managerial, or communications skills. The teachers themselves work on different levels and in different disciplines: for drinking water companies, water boards, engineering bureaus, industries or the government.

SWO also trains professionals from the sector to develop their didactic skills and become good trainers themselves. The combination of technical training with a train-the-trainer program has proven to be very successful.

Inspiring and practical courses, tailored to you

SWO develops courses in cooperation with the water sector. Teachers working in the sector themselves, know best which knowledge and know-how is required. Examples from their own practice appear to be very inspiring. Our courses are of high quality and are frequently updated. SWO can offer you a program tailored to your company and to your employees.

Not-for-profit, not-for-loss

Being a training institute owned by the water sector, the primary goal of SWO has always been to teach practical and up-to-date knowledge on all water related subjects. Working on a not-for-profit, not-for-loss basis guarantees a sustainable organisation. All costs have to be paid by the participants or their company, but with a limited staff we keep costs moderate. Freelance trainers and authors receive a fee. Our courses offer value for money, both in the Netherlands and abroad.

The scope of SWO

SWO organises professional development for the employees in the water sector

- Diploma oriented programmes
- Short courses
- Training on skills

The titles cover a broad spectrum of subjects related to water: water systems, water supply (treatment and distribution), sewerage, waste water treatment and skills. Appendix 1 gives a full list of the current titles.

Education fields

Water systems
Water quality and water quantity
Enforcement
Safety and dikes
Water supply
Sewerage
Waste water treatment
Operation and maintenance

Key figures from SWO (2008)

2,5 mio € turnover
2500 students
250 free lance trainers
150 groups
80 different titles
70% graduation
18 staff members

SWO covers the complete life cycle of training programmes. We assess training needs and develop the course programmes together with the water organisations. We implement the course, select the teachers and organise the production of teaching material. Since both teachers and participants come from the water sector, SWO has a large network and can adjust to newest developments. We pay much attention to train the professionals (having the practical knowledge and expertise) to be a teacher and furthermore we pay continuously attention to the didactic support of our teachers and trainers.

Using the SWO-concept in other countries**Some starting statements**

- Worldwide there is an abundant amount of knowledge, know-how and expertise on water subjects, especially on higher and academic level
- Due to the millennium development goals lots of projects- world wide- are realised in order to provide continuously and healthy water
- Workers, operators, are not skilled in the field and the specific aspects of water

The SWO concept has proven to be very well applicable in other countries (Europe, Asia, and Africa). The results of the programmes organised in the Mekong Delta Region Vietnam were successful and the first steps are made in the set-up of a training centre in Vietnam, according the SWO-concept. SWO developed two courses on Operating and maintenance in distribution and Operating and maintenance in the treatment of drinking water for workers on vocational level. These courses were delivered to 2 groups of Vietnamese water professionals with the – expected- skills to become a trainer. The course programmes consisted of a 50-50 mixture of technical and practical contents and train the trainer skills: the intention was to train professionals to become a trainer. Special attention was paid on teaching methods and interactivity. Finally approx. 20 participants passed the train the trainer test. They will be future trainers in Vietnam. New projects have to be started up to coach the Vietnamese course manager to develop and organise the courses.

Blueprint training institute

Having many years experience running a training institute on a sound financial basis, the SWO way of working can be implemented elsewhere. We developed a blueprint for establishing a training institute abroad, based on the same unique three principles as in the Netherlands. Vietnam will be the first country for further implementation.

Blueprint

This blueprint describes an overall concept of setting up training centres on water related issues - water supply and sanitation - in developing countries as well as in countries in transition. Mentioned are a lot of tools which may be used in setting up such a Training Centre in these fields. Any Training Centre should provide specific training programmes, tailor-made to the requirements of the water companies (with regards to water supply) and communities (with regards to sanitation) complementary to the regular vocational education already available in that country.

The blueprint is based on the Wateropleidingen (SWO) concept, the educational concept of Wateropleidingen and the experience Wateropleidingen has with setting up a training centre in foreign countries, for example in Vietnam, Indonesia, South Africa and countries in Central and East Europe. Here you find more information about the projects in developing countries.

This blueprint consists of five parts. In the first part of the blueprint, the educational concept of Wateropleidingen is described. Also information about Wateropleidingen is given. In the second part, the institutional aspects of setting up a training centre are described. In the third part, the development of a course is explained. The fourth part elaborates of the organization of a course. The fifth and the last part starts with some general information, followed by a scheme with the steps that have to be taken in the design and organization of a course. In the last part of the blueprint, you will find information about the different roles in design and organize a course, and a time table for the development and organization of a course.

To keep this blueprint as practical as possible, the various steps of the schemes are made explicit by the use of practical examples.

Click on the below links to go to the other parts of the blueprint:

- part 1: information about Wateropleidingen/SWO and the educational concept
- part 2: institutional aspects of setting up a training centre
- part 3: the development of a course
- part 4: the organization of a course
- part 5: the roles and a time table

Tailored programmes for the water professionals

To develop a course the following steps are made:

1. Define the target group and the learning objectives
2. Select experienced professionals
3. Train the professionals to become trainer
4. Design the programme/schedule
5. Select teaching methods

6. Write or put together a course book (feed back questions, practice and (group) exercise
7. Compose students guideline and a teachers guideline
8. Organise the course (logistic arrangement, communication etc)

For every course the selection of trainers, of topics and teaching methods is specific. As well the element of teaching and interaction between the students is incorporated.

Example of the water education programme: Comprehensive water treatment techniques

- Target group: operators of waste water treatment plant
- Intermediate vocational level
- 36 lessons of 2,5 hour each with 4-6 different trainers (professionals with specific expertise)
- Course book of 350 pages
- Study load: 200 hours
- 2 written assessments

Recommendations

From the experiences SWO, training centre for water management, the following recommendations can be made:

- Make a connection to a water professionals association in order to come in touch with experienced professionals who are willing to share their experience;
- Use the “for professionals, by professionals- concept”. The professionals have specific knowledge, always practical and up-to date. They share their tacit knowledge and the training centre “fixes” this knowledge in course books;
- Train professionals didactically to become a teacher. A didactical training is useful because most professionals like to “preach”; they are less focused on the target group and the they knowledge need;
- Develop tailored courses and training programmes to fit the target group and the learning goals. The target group will be interested if they can use the knowledge from the lessons tomorrow in their own work;
- Establish an institution focussed on professional training; Training courses for professionals are quite different from secondary and tertiary education programmes;
- Organise long lasting courses; The water problems are huge and wide spread. The solutions are divers and the policy makers and technicians need advanced practical knowledge.
- Assure a continuous improvement; as the water sector develops, also the solutions for problems are developing. All courses need to be up-to-date.

Summary

Wateropleidingen (SWO) has developed the SWO concept, during the 15 years of experience and improvement.

The SWO-concept consists of 3 main aspects:

- training for professionals by professionals
- inspiring and practical courses, tailored to you
- not-for-profit, not-for-loss

The first aspect of the unique concept of SWO is that the participants are trained by professionals from the water sector itself. About 250 teachers are available on

a freelance basis for all types of courses, be it technical, financial, managerial, or communications skills. The teachers themselves work on different levels and in different disciplines: for drinking water companies, water boards, engineering bureaus, industries or the government.

SWO also trains professionals from the sector to develop their didactic skills and become good trainers themselves. The combination of technical training with a train-the-trainer program has proven to be very successful.

SWO is a foundation, self-financed.

The SWO concept has proven to be well applicable in other countries, for instance the Mekong Delta in Vietnam. Focus of the SWO-concept is the long lasting and sustainable organisation and delivery of practical courses. The practical knowledge is available everywhere, and has to be transferred in a way that the students will have to improve competence to fulfil their jobs.

The course fee have to be that amount that a sustainable organisation can be se up.

SWO/Wateropleidingen

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Water courses

Water systems

Integrated water management
Integrated water management and maintenance
Aquatic ecology
Dams and weirs
Licences for dams and weirs
Sampling surface water and sewage
Mud removal
Basics in hydrology and hydraulics
Water mark management
Urban water plans, development of a perception of urban water management.
Ecological restoration of minor waterways.

The abstraction and production of drinking water

Basic training in the production of drinking water.
Selected topics about drinking water production.
Training for positions in processing, production and quality assurance.
Professional training for positions in project-oriented activities to realise production installations
Modern purification technologies for the production of drinking water.
Membrane filtration

The distribution of drinking water

Basic training in the distribution of drinking water.
Selected topics in the distribution of drinking water.
Training for positions in the design of pipelines.
Training for positions in project management for the execution and management of distribution.
Training for positions in supervision and consultancy involving drinking water installations.
Legionella
Sampling at water supply companies.
Microbiological sampling.
Cleaning water supply networks.
Preparing flushing plans for drinking-water supplies.
Hygienic working practices.

Sewerage

Technical aspects of sewerage
Basic training in sewerage
Selected topics about sewerage
Fluid mechanics of sewers.
Measuring sewerage systems

Waste water treatment

Water treatment techniques.
Comprehensive water treatment techniques
Higher water treatment
Removal of nitrogen compounds and phosphates.
Polishing effluent
Selected topics in waste water treatment
Membrane bioreactor
Anaerobic treatment

Water and communication

Effective governing for board members
Governmental sensitivity
Asset management
Maintenance
Train the trainer
Didactical workshops
Presentation techniques