



Qualification Standards for Technicians and Master Technician in Germany

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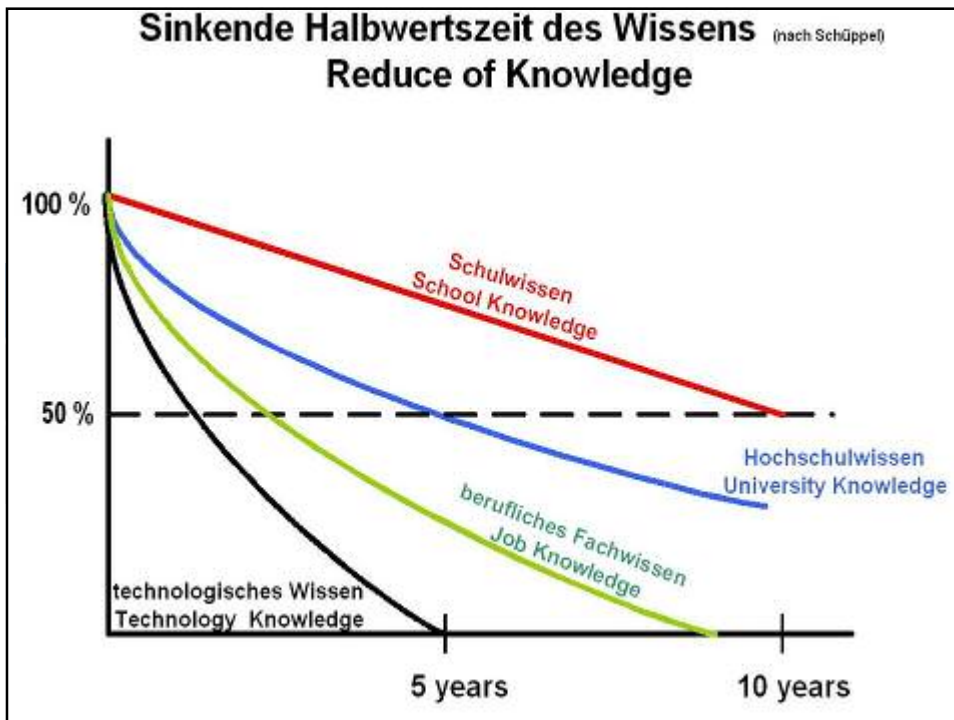
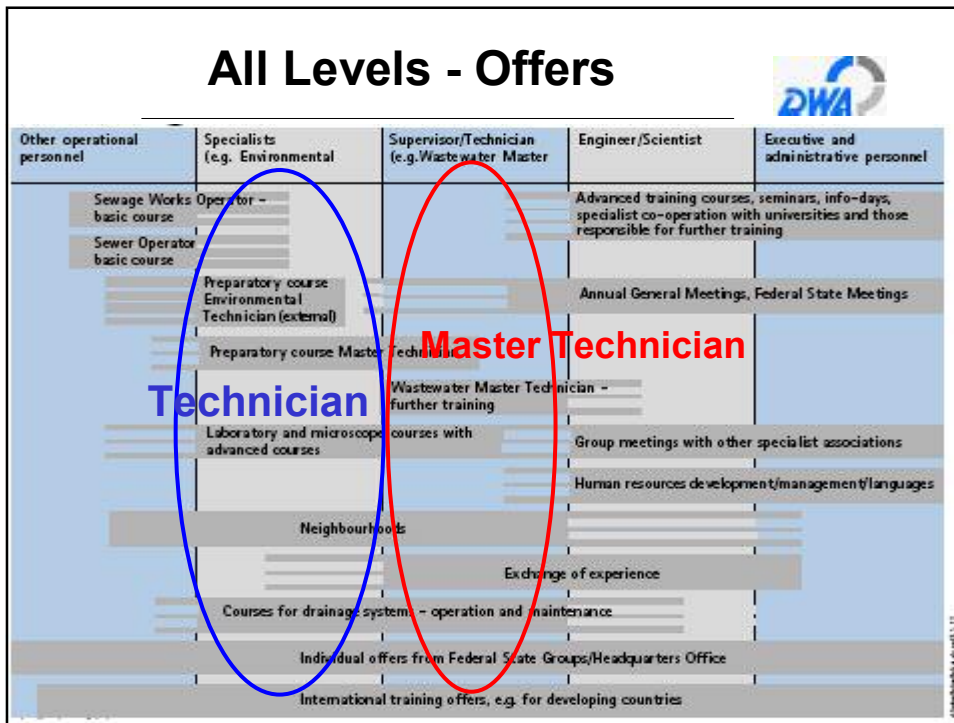
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Who is DWA?



- ▶ **Founded 1948 by the Cities of Germany**
- ▶ **Non Profit - Non Government Organization**
- ▶ **Driven by 14 000 Members**
- ▶ **120 Employees in 8 Offices**
- ▶ **Information platform for Public and Professionals**
- ▶ **Supports the Government (Law making)**
- ▶ **Technical Standard Body**
- ▶ **Training and Continuous Learning**
- ▶ **Know-How Transfer**





Target Groups

- ▶ Technician
- ▶ Master Technician
- ▶ Engineers, Scientists
- ▶ Lawyer, Administration Staff



Jobs for Young People



**German
Technical
Vocational
Training
and Education
(TVET)**



Water Sector Technicians and Master Technicians

History of Occupations



- ▶ **1984**
Germany got the first occupation for Sewage-, Water Supply-, and Waste Engineering Technicians
- ▶ **1987**
Master Engineering Technicians were introduced
- ▶ **2002**
These “old byelaws” were updated and the new name Environmental Engineering Technicians (EET) was created
- ▶ **2005**
Based on these four occupations the Master Engineering Technicians were updated

Environmental Professionals



1. Technician for Water Supply Utilities
2. Technician for Waste Water Utilities
3. Technician for Waste and Recycling
4. Technician for Pipes, Sewer and Industry

- ▶ Profession 1-3 since 1984 with approx. 10 000 passed
- ▶ Profession 4 new since 2002
- ▶ Government recognised Qualification Level

Professional Qualification



- ▶ Duration: 3 Years (36 Month)
- ▶ Place: Utility and Vocational School
- ▶ Core Qualification: 15 Month
- ▶ Qualification: 21 Month
- ▶ Level: Primary school
- ▶ Tests: Pre test and final test
- ▶ Further Qualification: Master Technician

Waste Water Technician Training

- ▶ 13 weeks over 2 years
- ▶ 4 Places in Germany
- ▶ Test are done by the government

1	Kernqualifikation Grundlagen Teil 1 2 Wochen
2	Elektrotechnik in Theorie und Praxis 3 Wochen
3	Kernqualifikation Grundlagen Teil 2 2 Wochen
4	Fachqualifikation Abwassertechnik 4 Wochen
5	Fachqualifikation Abwassertechnik Labor in Theorie und Praxis 1 Woche
6	Stoffzusammenfassung 1 Woche
7	Prüfung

Waste Water Master Training

- ▶ 13 weeks over 2 years
- ▶ 4 Places in Germany
- ▶ Test are done by the government

Kontinuierliches Lernen – Selbststudienaufgaben, Projektarbeiten, Anordnungen, Hausaufgaben	Block 1 Grundlegende Qualifikation 2 Wochen	Grundlegende Qualifikationen <ul style="list-style-type: none"> ▶ Rechtsbewusstes Handeln ▶ Betriebswirtschaftliches Handeln ▶ Anwenden von Methoden der Informatik, Kommunikation und Planung ▶ Zusammenarbeit im Betrieb ▶ Berücksichtigen naturwissenschaftlicher und technischer Systemmöglichkeiten
	Block 2 Grundlegende Qualifikation 1 Woche	
	Zwischenprüfung Grundlegende Qualifikationen	
	Zusatzblock Ausbildungsprüfung 1 Woche	Berufs- und arbeitspädagogische Qualifikationen (Nachweis vor letzter Prüfung erforderlich)
	Block 3 Handlungsspezifische Qualifikation 2 Wochen	Handlungsspezifische Qualifikationen (Hochleistungsnetzwerk Technik) <ul style="list-style-type: none"> ▶ Betrieb ▶ Überwachung ▶ Instandhaltung
	Block 4 Handlungsspezifische Qualifikation 1 Woche	Handlungsspezifische Qualifikationen (Hochleistungsnetzwerk Organisation) <ul style="list-style-type: none"> ▶ Kostenwesen ▶ Betriebsführung, Betriebsüberwachung und Kundenorientierung ▶ Arbeit-, Umwelt- und Gesundheitsschutz ▶ Recht
	Block 5 Handlungsspezifische Qualifikation 1 Woche	Handlungsspezifische Qualifikationen (Hochleistungsnetzwerk Führung und Personal) <ul style="list-style-type: none"> ▶ Personalführung ▶ Personalentwicklung ▶ Managementsysteme
	Block 6 Handlungsspezifische Qualifikation 1 Woche	
Wärtsklopprüfung Handlungsspezifische Qualifikationen		

Technicians & Masters



- ▶ The Technician Training qualifies technicians from other occupations and non qualified workers to become a Sewage Engineering Technician Management of WWTP up to 30000 Population Equivalent (PE)
- ▶ Masters are allowed to manage sewer systems and waste water treatment plants (WWTP) up to 80000 PE



Technician



German Technical Vocational Training and Education (TVET) Schools

3 years dual-education

DWA - EET Training during 2 years 13 weeks training

Prequalification needed

Approx. 500 per year

Approx. 100 per year



Training Examples







Health and Safety Training







Master Technician

Waste Water Master Technician

* Government Regulation since 1987 updated 23.2.2005

* **Basic Qualifications**

- * Legal Acting
- * Economic Acting
- * Methods of Information, Communication and Planning
- * Scientific and Technical Applications (Basics)
- * Teamwork

* **Special Qualifications**

- * **Techniques**
- * **Organization**
- * **Leadership and Staff**

Special Qualifications

3 Tests (acting orientated), 2 written one oral

Techniques

- Operation
- Monitoring
- Maintenance

Organization

- Organize Operation
- Work, Environment and Health Safety
- Costs
- Law

Leadership and Staff

- Leading Staff
- Promoting Staff
- Management Systems

All 10 qualifications must be once asked in one of the three situation based tests

Techniques



- ▶ **Operation**
 - Control and optimizing the process as well as the mechanical and electronic devices
 - Emergency management
 - Set up and close down devices during operation
- ▶ **Monitoring**
 - Self monitoring
 - Monitoring effluent discharger to the sewer network
 - Avoid and protect emissions
 - Statistic and documentation
- ▶ **Maintenance**
 - Maintenance and inspection of civil works, pipelines and mechanical and electronic devices
 - Plans for inspections and maintenance
 - Documentation

Organization



- ▶ **Organize Operation**
 - Operation
 - Operation Monitoring
 - Customer Relation Management
- ▶ **Work, Environment and Health Safety**
- ▶ **Costs**
 - Cost planning, processing, monitoring
 - Methods of calculation
 - Processing commissions
- ▶ **Law**
 - Water Law, Government Emission Law, Recycle management and Waste Law
 - Technical Standards and Rules
 - Municipality Law

Leadership and Staff



- ▶ **Leading Staff**
 - Need Assessment
 - Staff plan
 - Management style
- ▶ **Promoting Staff**
 - Targets and criteria of success
 - Potential of staff
 - Matters of qualification of staff
 - Professional development of staff
- ▶ **Management Systems**
 - Impact to the company
 - Staff awareness
 - Guarantee, Improvement, Development
 - Continuous Acting

Level of Qualifications




Technician

- 3 years
- since 1984
- 30 000 PE


Master Technician

- 2 years
- since 1987
- 80 000 PE

400 - 500 each year



Continuous Learning



Model Neighbourhood

- ▶ Since 25 years in Germany and Austria
- ▶ Target group → Operators
- ▶ Regional Groups approx. 10-20
- ▶ 2-3 meetings per year
- ▶ Teachers get trained

3. Leistungsvorgleich in den Nachbarschaften

Mit den folgenden Zahlenangaben können sich die einzelnen Pflanzlagen in die Sauerstoff-Bedarfsstufen einordnen oder mit anderen Anlagen vergleichen. Letzteres erfordert die entsprechende Mindestzahl der 500- und 100-Gräber. Der einzelnen Nachbarschaften ist jeweils einer Durchschnittliche Zusammengefasst.

Sauerstoffbedarfstufen
unter 1,50
1,50 - 1,99
2,00 - 2,49
2,50 - 2,99
3,00 - 3,49
3,50 und größer

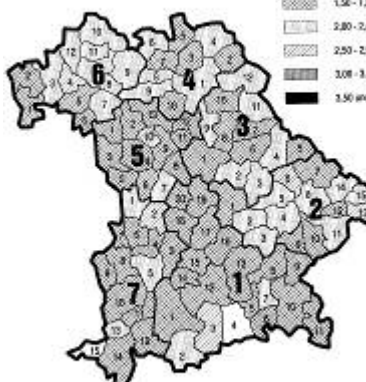
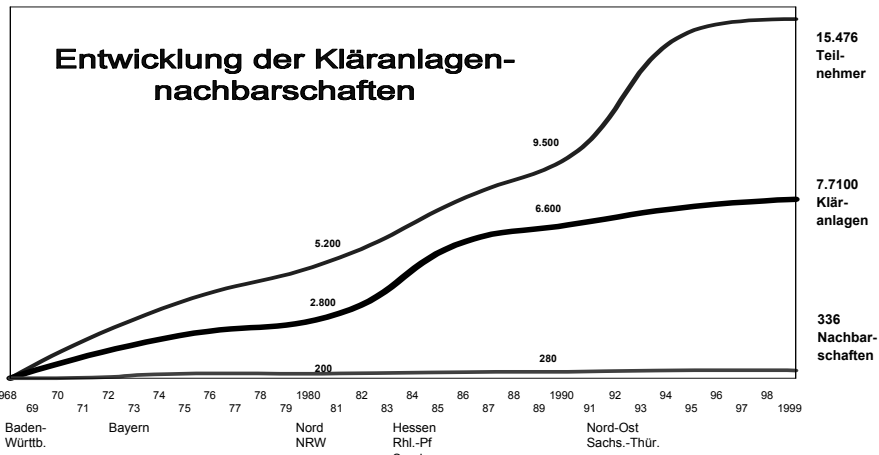


Abb. 13 Die Sauerstoffbedarfstufen 1999 in den bayer. Nachbarschaften - nach Anzahl der Kolumbarien ausgewertet-

Neighbourhoods



- ▶ 350 neighbourhoods, 7700 WWTPs, 15000 participants
- ▶ Waste disposal, Sewer system, Rivers and lakes



Transfer to other countries



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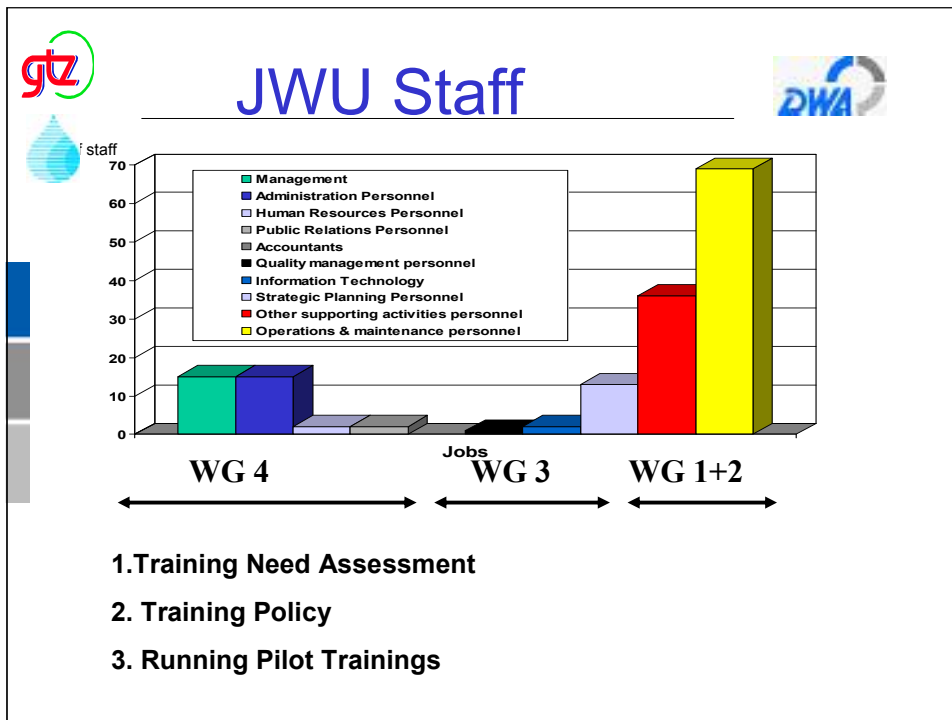


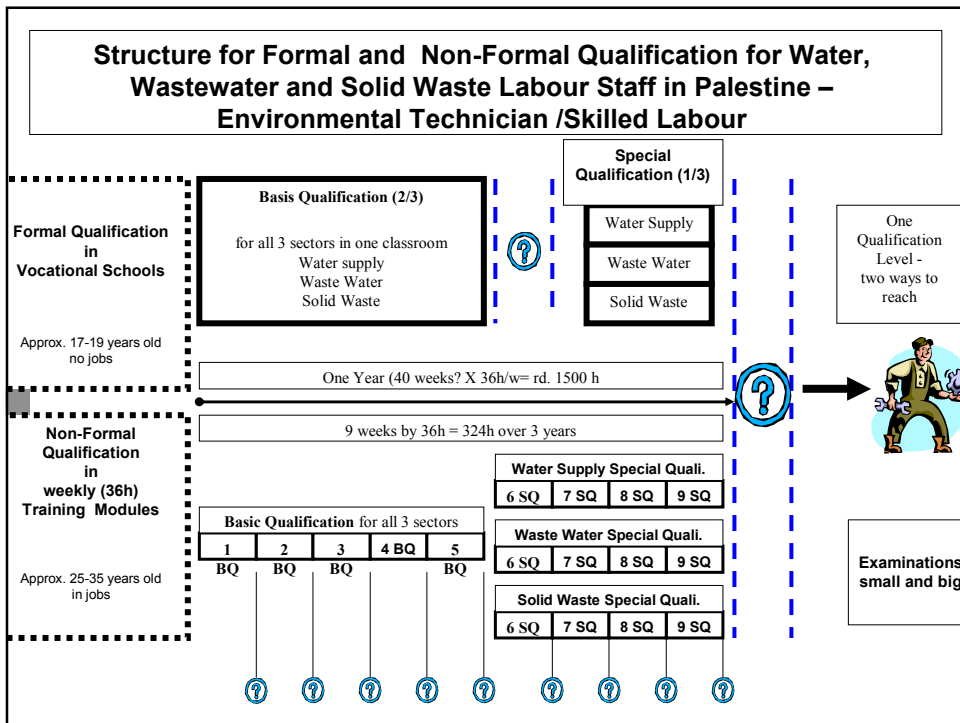
GTZ Palestina



Support to the Palestinian Water Authority in Managing and Coordinating Training in the Water Sector in Palestine







Delegations welcome



Meet the German Water Industry



Syria 2005



Palästine 2004



Palästine 2003



Poland, CZ, H, Rumania 2001



China 2004

Thank you



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