

DEVELOPING COUNTRIES

PTB's contribution to legal metrology in developing countries

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1 Introductory remarks

Since 1956, the Government of the Federal Republic of Germany has supported the economic development of many countries. Part of the fight against hunger and poverty is the establishment of an efficient economic system and its integration into the world economy. This will, however, only be successful if the technical infrastructure for a metrology, standardization, testing and quality assurance (MSTQ) system as well as an accreditation and certification system are built up at the same time. Metrology (and legal metrology in particular) are vital for economic and social development.

The responsible Federal Ministry for Economic Cooperation and Development (BMZ) therefore entrusts the PTB with the implementation of development projects in the field of MSTQ.

Further information is available in the brochure "PTB and Development Cooperation" which can be obtained from the PTB or from the author. Projects currently being implemented are given in the list at the end of this article.

Following some general remarks about Technical Cooperation, a summary of the activities undertaken since 1966 is given in section 3. Projects and activities implemented before 1966 are described in the paper "Strengthening of legal metrology in developing countries" presented at the OIML Symposium *Metrological Activities in Developing Countries* held in Beijing, China, in 1995; selected lectures have been published by the BIML.

2 General remarks on the PTB's Technical Cooperation

The PTB is the national institute of science and technology of the Federal Republic of Germany and is

the highest authority for metrology and certain sectors of safety engineering. The PTB makes use of the specialist technical knowledge of its staff to implement MSTQ projects all over the world. The PTB's contributions cover advisory services in the following areas:

- establishment and organization of structures and institutions;
- legal bases, technical rules and standards;
- planning and construction of laboratories with their technical equipment;
- equipping with measuring instruments and test devices;
- staff development and qualification;
- making political decision-making bodies and representatives of industry and economy aware of the significance of MSTQ matters;
- solution of special problems; and
- accreditation of laboratories.

Basic and advanced training

In addition to technical training ranging from several weeks up to one year, seminars and practical training courses are organized, sometimes in cooperation with international organizations, in which participants from countries with which no project agreements have been concluded can participate.

Supply of materials and equipment

Part of the project funds are used to equip the measurement and test laboratories with the necessary facilities. If necessary, the instruments are first tested or calibrated and then put into operation in the partner institutes' laboratories with support from experts. The instruments are selected so that they are appropriate for the tasks to be accomplished and do not cause follow-on costs that the partner is unable to bear in the long term. The supplies also comprise technical rules and standards.

Accreditation and certification

Project measures support the establishment of accreditation and certification systems in partner countries and thus facilitate access to international markets. By the accreditation of laboratories of the partner institutes in accordance with international guidelines, the competence of the partners is documented and the acceptance of their services and certificates also furthered at international level.

Table 1 Support for legal metrology through bilateral projects	Mongolia	Thailand	Turkey
<i>Project Partner</i>	National Institute for Standardization and Metrology	Dept. of Commercial Registration	General Directorate for Metrology and Standardization
<i>Duration</i>	1996–2001	1993–2003	1993–2002
<i>Germany's contribution in million DM</i>	1.0	4.2	6.2
<i>Long-term training in Germany (> 12 months)</i>	-	6 persons	10 persons
<i>Short-term training in Germany (< 3 months) and study tours</i>	3 persons	17 persons	16 persons
<i>Short-term experts</i>	3 persons, 3 months	11 persons, 13 months	15 persons, 8 months
<i>Workshops</i>	* Mass determination * Verification of fuel dispensers	* Non-automatic weighing instr. * Harmonization of technical regulations in Europe * Control of prepackages	* Weighing instruments * Flowmeters for water * Harmonization of technical regulations * Control of prepackages
<i>Equipment for verification of</i>	* weights (up to 500 kg) * prepackages * fuel dispensers	* weights (up to 500 kg) * prepackages * fuel dispensers	* weights * prepackages * fuel dispensers

Since projects are implemented in a spirit of partnership, the recipient countries must make contributions. The partner country makes available the funds for the necessary buildings, the personnel and the operating costs and provides the legal and administrative framework conditions for the project to be successfully implemented. In addition to sufficient political stability and appropriate legal framework conditions, the partner countries' commitment to making their own contributions as required is therefore also a prerequisite for the implementation of projects.

3 PTB's contributions

Bilateral projects exclusively intended to support relevant legal metrology are being implemented in Mongolia, Thailand and Turkey. Relevant information is given in Table 1.

Besides such bilateral projects, further activities are carried out for training (summarized in Table 2) and for other activities (Table 3). Since regional cooperation and the formation of regional markets is gaining in importance, the PTB has also started Technical Cooperation with regions. A cooperation with SADC MEL, the regional organization for legal metrology of the ten Southern African Development Community countries, has been established. Besides consultancy on regulations for prepacked goods, the newly established SADC Resource Center for Metrology Education has been supported by training trainers in the fields of mass, temperature and prepacked goods.

In cooperation with the PTB's project partner in Thailand, a regional seminar on "*The Importance of Legal Metrology and Opportunities of Regional Cooperation*" was held in Chiang Mai, Thailand, on November 8–9, 1999. The seminar was attended by 46 participants from Cambodia, Lao PDR, Malaysia, Philippines, Thailand and Vietnam. Speakers from the BIML, the Asia Pacific Legal Metrology Forum (APLMF) and the PTB gave key information on:

- the global challenges to legal metrology;
- the necessity for a verification system and its benefit to society, commerce and industry; and
- actions that could be recommended for the development of a metrological infrastructure for consumer protection based on national and international requirements.

Table 2 Training Seminars and Workshops in legal metrology supported by the PTB, 1996-2000

Subject	Year	Organized by	Practical Training	Country	Support for participants
Legal metrology	1996	DAM	-	Germany	Chinese participants only
Prepackages	1996	DAM	DAM, Factories	Germany	22
Mass scale	1996	PTB / ARSO	KEBS	Kenya	14
Volume flow	1997	PTB / ARSO	KEBS	Kenya	11
Prepackages	1997	SABS / PTB	SABS, Factories	South Africa	13
Mass	1997	NML / PTB	NML	South Africa	12
Legal metrology	1998	PTB	-	China	Chinese participants only
Volume standards	1998	DAM	DAM	Germany	10
Weighing instruments	1999	DAM	DAM	Germany	6
Volume	1999	DAM	DAM	Germany	5
Temperature	1999	SADC MET	MBS	Mauritius	15
Prepackages (Regulations)	1999	SADC MEL	-	South Africa	12
Prepackages (Checking)	1999	DAM	DAM	Germany	8
Legal metrology	1999	PTB / GDWM	-	Thailand	40
Volume	2000	DAM	DAM	Germany	2
Flow meters	2000	DAM	DAM	Germany	10
Weighing instruments	2000	CBWM	CBWM	Thailand	6
Measuring instruments in road traffic	2000	DAM	DAM	Germany	9
ARSO:	African Regional Organization for Standardization		MBS:	Mauritius Bureau of Standards	
CBWM:	Central Bureau for Weights and Measures (Thailand)		NML:	National Metrology Laboratory (South Africa)	
DAM:	Deutsche Akademie für Metrologie		SABS:	South Africa Bureau of Standards	
KEBS:	Kenya Bureau of Standards				

List of projects currently being implemented (as of July 2000)				
Country	Project partner	Project title	Period	Germany's contribution (million DM)
AR	Instituto Nacional de Tecnología Industrial, INTI	Promotion of Legal Metrology and Calibration Services	1985–2001	4,8
AR	Centro de Investigaciones Acústicas y Luminotécnicas, CIAL	Support for Audiometry and Noise Level Measurements	1995–2000	0,2
AR	Instituto Nacional de Tecnología Industrial, INTI	Advice on the Establishment of a National Quality System	1999–2002	2,7
AM	Instituto Centroamericano de Investigación y Tecnología Industrial, Guatemala	Promotion of standardization, testing and metrology at ICAITI		
BO	Viceministerio Nacional de Industria y Comercio Interno, VICI	Build-up of the Bolivian System of Standardization, Metrology, Accreditation and Certification	1998–2001	2,2
BR	Centros de Referencia em Tecnologias Inovadoras, CERTI	Establishment of a Calibration Laboratory	1993–2002	3,5
BR	Instituto Nacional de Metrologia Normalização e Qualidade Industrial, INMETRO	Amelioration of Preconditions for Certification	1995–2000	0,8
BG	State Committee for Standardization and Metrology	Support of Metrology in Bulgaria II	1996–2001	0,8
CL	Instituto Nacional de Normalización, INN	Establishment of a Metrology Net	1997–2001	1,8
CO	Superintendencia de Industria y Comercio, SIC	National Accred. and Certif. System	1999–2001	1,1
EC	Instituto Ecuatoriano de Normalización, INEN	Technology Transfer in Metrology	1999	0,1
GR	Hellenic Institute of Metrology, EIM	Establish National Metrology System	1994– ---	
HR	State Bureau for Metrology and Standardization	Amelioration of Croatia's Metrological Infrastructure	1998–2001	1,0
JM	Jamaica Bureau of Standards, JBS	Bureau of Standards	1994–2001	1,6
MN	National Institute for Standardization and Metrology	Support for Legal Metrology	1996–2001	1,0
MX	Centro Nacional de Metrología, CENAM	Cooperation in Metrology	1989–2000	3,6
NI	Dirección de Ciencias y Tecnología en el Ministerio de Economía y Desarrollo	Advice on Metrology	1993–2003	0,1
RO	R & D Institute ICMET	Support of ICMET Craiova	1995–2001	0,9
RO	National Metrology Institute, INM	Amelioration of Metrology	1996–2001	1,2
SL	Standards and Metrology Institute of Slovenia	Improve Slovenia's Metrological Infrastructure	1995–2000	1,2
TH	Department of Commercial Registration	Amelioration of Legal Metrology	1993–2003	4,2
TH	National Institute of Metrology (Thailand), NIMT	Support Metrology & Nat'l Calib. Service	1999–2003	2,6
TR	General Directorate for Metrology and Standardization	Support of Legal Metrology	1993–2002	6,2
TR	National Metrology Institute	Establishment of a Metrology Institute and a Calibration Service	1991–2000	6,5
TR	Türk Standardları Enstitüsü, TSE	Support for Turkey's National Standards Institute	1987–2000	9,2
TR	Undersecretariat for Foreign Trade	Support for the Establishment of a Turkish Accreditation System	1999–2003	2,0
UY	Laboratorio Tecnológico del Uruguay, LATU	Support of the National MSTQ System	1992–2000	2,3
UY	Organismo Uruguayo de Acreditación	Advisory Support for Accred. Body of Uruguay	1999–2000	0,2
VE	Servicio Autónomo Nacional de Metrología, SANAMET; Comisión Venezolana de Normas Industriales, COVENIN	Support of the National MSTQ-Services	1989–2003	4,1
	Regional Project	Support for MSTQ	1998–2001	1,4
	Regional Project	Support of MSTQ in African and Arabian Countries	1998–2002	2,0
	Regional Project	Support of Metrology in Middle and East European and CIS Countries	2000	0,3
	Regional Project	Improvement of relations between MSTQ projects and projects promoting economic development and employment	2000–2003	1,0

Table 3 Support for legal metrology in developing countries as part of PTB's project activities 1996–2000

Country	
Argentina	Consultancy, seminar, evaluation of the national legal metrology system
Chile	Consultancy on national measurement standards
Bolivia	Supply of mass standards, training
Costa Rica	Training in mass, pressure, length, volume, density, viscosity
Ecuador	Consultancy
India	Supply of a test rig for volume flow
Jamaica	Training in volume measurement
Panama	Supply of measuring equipment, training, calibration of standards
Peru	Training in mass, calibration of mass standards
Uruguay	Consultancy, calibration of measurement standards, training
Vietnam (EU-project)	Consultancy

After hearing reports on legal metrology in the countries represented at the seminar, the participants identified needs for and evoked possibilities of cooperation in legal metrology among the countries of this region. It was agreed to hold a follow-up seminar in October 2000 in conjunction with the meeting of the APLMF.

An assessment of the legal metrology system in Malta is under preparation and the PTB will send two experts to Malta for discussions on the system and on the formulation of the terms of reference for this assessment.

With the aim of strengthening legal metrology services in developing countries, the United Nations Industrial Development Organization (UNIDO), the OIML and the PTB signed a Letter of Intent in 1999. Provided financial resources are available and in accordance with its approved program of work these organizations will contribute to achieving this objective. The activities will be focused on least developed countries in Africa. The beneficiaries will be selected taking into account their commitment to making contributions and their ability to ensure success of the project and to achieve sustainable effects.

Other institutes and donor organizations are invited to join this initiative. Preparatory work has been started by the PTB to gather relevant data of African countries. A first mission to West African countries is scheduled for November 2000 and the OIML is expected to provide model laws and regulations. Projects will be funded from UNIDO and PTB resources but cooperation with and contributions from other organizations are welcome. ■

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