



# The contribution of a Quality Infrastructure (QI) to rural development and to the promotion of agricultural value chains

## Introduction

This position paper explains the contribution which a Quality Infrastructure (QI) can make to the focal area of “rural development”. Furthermore, this paper presents proposals as to how QI can be used more strongly for rural development. These proposals are based on the many years of experience which the Physikalisch-Technische Bundesanstalt (PTB) has gained in promoting QI, with regard to the impacts which QI has on the economy and on the society of countries in transition and of developing countries. As an implementing agency of the German Development Cooperation, PTB

orients itself according to the requirements of the Federal Ministry for Economic Cooperation and Development (*Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung – BMZ*). The Sectoral Concept “Quality Infrastructure, Conformity Assessment – Metrology, Standardization, Testing (MSTQ, 2004)” defines the scope for the promotion of QI. The promotion of QI is relevant for sustainable economic development, as well as for “Aid for Trade”, and it contributes to a social and ecological market economy.

The contribution of QI to the field of rural development and to the promotion of agricultural value chains complies with the following provisions:

- An increased quality assurance in the production, processing and distribution of food improves the health value as well as the availability of food thus contributing to food security.
- Promoting the quality in agricultural production and in all the related concerns of processing and supporting services leads to an increase of added value and safeguards employment.
- If local capabilities exist in rural areas for the carrying out of competent and reliable laboratory analyses, this brings about health protection for the population as well as environmental protection for the population's living environment.
- The conformity with national and international guidelines and standards furthers competitiveness and creates favourable preconditions for a modernization of the state, for market transparency, and for a sustainable use of the natural resources.

## 2. Fields of action

The fields of action as well as the proposals for action – both described here and selected for the bilateral development cooperation – are geared to the fields of action of the special initiative “A World without Hunger” (SEWOH). The promotion of QI must be understood as part of the International Cooperation (IC). This part of IC unfolds its full potential within the scope of the fields of action of the special initiative and of the measures for rural development. The aim is to safeguard the effectiveness and the sustainability of development measures (e.g. the support of innovation centres, the promotion of value chains, and the provision of healthy food), especially via locally accessible and competent QI services.

The proposals for action contribute, in particular, to field of action 3 (Promotion of Agricultural Innovation) and to field of action 4 (Promotion of an Ecological and Socially Acceptable Structural Change) of the special initiative “A World without Hunger”. Due to their cross-sectional character, the QI services can be of relevance also for other fields.

### 2.1. Promotion of agricultural innovation

- **by providing local access to competent laboratory analyses and certification**

Innovation and research in the agricultural sector require significant capabilities for carrying out laboratory analyses. Part of the required capabilities can be made available centrally and will be based on the division of labour (for example, by using laboratories in the cities when complex research

topics are being dealt with or if special equipment is needed). In decentralized – i.e. rural – areas, however, an adequate laboratory infrastructure must be available in order to carry out reliable and competent laboratory analyses. Such laboratory analyses combine research and development in rural areas with personal competence and integrated QI approaches. In places where laboratories already exist, it is necessary to ensure and to extend the technical competence and performance.

In this way, results – such as soil, water and substance analyses – are furnished directly for taking decisions on what to grow and on the working equipment to be used. In addition, testing services are of importance – as they constitute a basis for product certifications and – thus – for market access. Only products which meet the requirements of the target market can be regarded as successful innovations.

- **by using standardization and certification for the application and dissemination of new technologies and production systems**

When new technologies and production systems are introduced and applied, standards and guidelines can contribute to the dissemination of information and knowledge about these. Example: In the case of an irrigation pump powered by wind energy, the rating of the pump must first be determined on the basis of technical facts and must then be agreed upon by all stakeholders. Then, the requirements are laid down and must be documented in a standard or in a guideline. The special characteristics of rural areas (for example, the educational level, the geographical position, and even possible illiteracy) as well as best agricultural practices will be taken into account when laying down these requirements. This means that both the suppliers of the new technologies and the users can orient themselves reliably according to these requirements. By awarding a certification, evidence can be given of the conformity of the products with standards, and





people's trust in the declaration of conformity can be increased. Further examples of how important standardization and the propagation of new technologies are for rural areas, are: the illumination in rural areas by means of photo-voltaics; the improvement of analysis data for the planning of what to grow; and the monitoring of ecosystems.

Proposals for action:

- Building up and safeguarding the competence of analysis laboratories in selected countries in centres of agricultural research and innovation
- Pilot measures for the development of a concept to disseminate technologies and production systems in rural areas by the use of standards and guidelines.

## 2.2. Safeguarding of the drinking-water quality in rural areas

**– by means of standardization and by providing local access to reliable analysis capabilities**



In order to make sure that programmes which are implemented to promote the drinking-water sector in rural areas achieve their objectives, analysis procedures are required which can be used to characterize the specific requirements with regard to purity and a sufficient amount of drinking water. Standards can be developed to determine these specific requirements. Some of the drinking-water analyses can be carried out centrally by external laboratories (in the cities). Others, however, must be carried out decentralized. It suggests itself that the available laboratory infrastructure (e.g. of research and innovation centres) must be optimized and used for different purposes. Laboratories for water analysis can be used in two ways: on the one hand, in connection with sewage and irrigation and, on the other hand, for product testing and drinking-water analysis. The operators of water supply systems in rural areas – irrespective of their size – must set up the respective networks or fall back on

existing networks to be able to cover the multifaceted demand for analysis data.

Proposals for action:

- Development or adaptation of standards as well as building up and safeguarding analytical competence for a reliable analysis of the quality of water in rural areas
- Setting up of networks between quality-assuring institutions (QI) and the operators of the water supply systems

## 2.3. Proper and sustainable use of fertilizers and pesticides

**– by gaining local access to affordable and competent laboratory analysis**

The means of production (fertilizers, pesticides, additives) used for the manufacturing, processing and marketing of food and animal feedstuff have an impact on occupational safety and food safety as well as on environmental pollution. The nutritional values of soils and plants, any residues in products, the pollution of products or of the ecosystem, as well as the blood values of male and female workers are determined by means of suitable laboratory analyses. These data are used, on the one hand, to prevent the improper use of problematic substances and the negative effects of these and, on the other hand, to optimize the application of substances, used for the improvement of the production process. Here, too, a locally established and integrated QI system for agricultural production can contribute decisively to complying with the requirements of health protection, consumer protection, and protection of the environment and it finally can contribute essentially to satisfy the demand of the international markets for recognized certificates.

The implementation and maintaining of recognized control systems, require as well proof of competence in testing services and certification processes.

Proposals for action:

- Building up internationally recognized competence in the fields of metrology and testing (in all participating technical institutions of QI [metrology, testing, conformity assessment], as well as in subject-related specialized institutions of the agricultural sector or engaged in rural areas)
- Supporting technical institutes of the agricultural sector in building networks and in using the national Quality Infrastructure for the implementation and consolidation of the systems for the monitoring of work safety, food safety and environmental protection in rural areas.



#### 2.4. Promotion of agricultural value chains and of food safety

##### – by means of quality assurance in production processes and products

Quality improvement and quality assurance in agricultural value chains

- improve the further processing and the marketability of agricultural products,
- ensure the food safety of agricultural products,
- reduce post-harvest losses and increase the productivity of local value chains, and
- contribute to the strengthening of the participating producers.

If the offer of QI services (such as standardization, laboratory testing and certification) is increasing locally, those services can increasingly be used for the agricultural production as well as in the related business environment. In consequence, the quality aspects can be taken more into account (depending on the requirements in the individual segments of a value chain). This will lead, all in all, to a higher productivity and better availability of agricultural products. If technical QI competence is anchored locally, it will be possible to better unite the requirements of the target markets with the productive potential of the rural areas. Not only competitiveness, but also the possibilities of the creation of added value will increase; employment will be secured and a higher market transparency will improve the entrepreneurial environment.

Proposals for action:

- Analysing the quality requirements of selected value chains (CALIDENA method) to find out how far a locally available QI is needed and how the services of such a QI can be strengthened and geared to the respective demand.

### 3. Conclusions

Offering a well-balanced palette of competent and recognized QI services (e.g. laboratory testing, calibrations and certifications) in rural areas represents a great challenge for developing countries. Purchasing and maintaining a technical infrastructure is – to some extent – quite cost-extensive; whether there is a demand for such services depends vitally on the efficiency and capability of the QI system and requires well-trained personnel. If the situation in rural areas is to be enhanced by improving the quality of the services rendered by the laboratories and certification bodies in these areas, then the competence of these service providers must also be ascertained by accreditation bodies which are able to render these services in rural areas. Against this background, the decentralized availability of certain QI services, the use of laboratories and equipment for multiple purposes and the coordination of competences by means of a synergetic division of labour is of great advantage. Due to the fact that PTB has been collaborating with almost all institutions of QI in the world for many years, the proposals for cooperation described above can be implemented very well and serve as proposals for action for designing the fields of action.

Before setting up an entirely new infrastructure, it should generally be checked, if there are already existing facilities which can be supported and further developed. An essential requirement is, however, that the QI services must be oriented according to international framework conditions and that they should be embedded in the corresponding regional and international structures through recognitions.

Last but not least, the demand for well-trained technical personnel offers a chance to promote the creation of jobs in rural areas and to contribute to an increased attraction of rural areas and to a better quality of life in these. The implementation of a Quality Infrastructure is therefore a systemic part of a programmatic approach to the promotion of rural development.