

Education and Training for Technician Development

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SYNOPSIS

The modern agricultural sector demands that technical vocational colleges or institutes produce highly skilled personnel who can manage a variety of farms and production units, run processing enterprises, service market chains, manage and repair farm and processing machinery, monitor food quality and safety issues, and support AIS actors in assessing the suitability of a particular innovation for specific persons, communities, farming systems, and value chains. In addition to technical knowledge, technical personnel need critical behavioral skills such as teamwork, diligence, creativity, and entrepreneurship. Reforms in the governance and management of training colleges and institutes are needed for traditional “agricultural technical-vocational education and training” (ATVET) and “vocational education and training” (VET) programs to deliver this array of skills in an equitable, gender-sensitive way. Demand for and content of vocational education and training must be clarified through dialogue with key sector actors (ministries of education and agriculture, employers of TVET/VET graduates, and staff and administrators of entities that train them for the public and private sectors). If the system produces graduates valued by stakeholders in the labor market, those stakeholders will help to sustain the system financially. The VET system must be underpinned by clear and supportive policy that defines the role of VET; guarantees public financial contributions to VET; clarifies roles and contributions of stakeholders who employ graduates; and spells out governance arrangements for the system. Based on documented needs and stakeholders’ expectations, invest in the capacity of teachers and instructors; develop certified programs that meet stakeholders’ needs (begin with a small number of good programs); and encourage cross-sector dialogue, because agricultural TVET/VET is often linked to other sectors’ programs and development plans (the environmental sector is a good example). IAPs 7, 8, and 9 examine specific investments in TVET and lessons learned.

BACKGROUND AND CONTEXT FOR INVESTMENT

Technicians interact on a regular basis with other actors in the AIS and are a unique repository of knowledge and—more important—skills that enable farmers and others to decide whether to adopt innovations. Public and private entities in agriculture have always relied on educated and trained technicians to undertake a range of tasks and activities that support production agriculture and form links in the value chain that leads to the local or international consumer. This reliance has been heightened by growth in agribusiness and the adaptation of advanced technology for producing, processing, and distributing agricultural goods and services (see also module 5).

Despite the need for skilled technical personnel generated by modern, knowledge-based commercial agriculture, with its emphasis on value-added and marketing, the demand for appropriately educated and trained technicians exceeds supply, and agribusiness entrepreneurs have difficulty hiring suitably qualified people. The shortage of qualified technicians persists amid significant reductions in public employment opportunities for technicians.

The shortage of skilled technicians is not new (it was noted during the 1970 FAO, UNESCO, and ILO Conference on Higher Agricultural Education). This shortage has been exacerbated in some countries by filling technician-level jobs with graduates who do not necessarily possess technicians’ practical skills and knowledge, to work directly with farmers (Muir-Leresche, pers. comm., 2010). A 2009 study (Blackie, Mutemba, and Ward 2009) showed that African university graduates typically lacked the hands-on skills and capabilities that farmers value most.

Government, the private sector, and civil society have a stake in ensuring that enough qualified, skilled agricultural technicians are available for the labor market. The preparation of technicians, traditionally sponsored largely by the public sector, can be expensive. It involves equipment, land, qualified instructors, and a low student-to-instructor ratio. While rapidly industrializing countries

are investing heavily in technical education and training to meet high demand for engineering and IT workers, public investments in formal agricultural diploma education (usually classified as ATVET) or certificate training (described as VET) vary and are unpredictable. The unevenness of investment gives rise to fluctuating student enrollment, poor staffing, weak program content, and a variable supply and quality of graduates.

As mentioned, modern agriculture emphasizes greater productivity, value added activities, and agribusiness. Agricultural products increasingly are consumed by growing urban populations or, in the case of high-value crops, sold in international markets. The focus on intensive farming and sustainability has created management complexity, altered energy requirements compared to traditional agriculture, and led to unforeseen consequences for human and animal health. The modern agricultural sector is also quite knowledge intensive. It demands highly skilled technical personnel who can manage a variety of farms and production units, run processing enterprises, service market chains, manage and repair farm and

processing machinery, and monitor food quality and safety issues (see also module 6, TN 5).

In addition, employers in many economies seek workers who possess behavioral skills such as teamwork, diligence, creativity, and entrepreneurship, which are essential to thrive in rapidly evolving, technologically driven, and globalized economies (Blom and Cheong 2010). For this reason, improvements only in workers' technical and vocational skills will not always meet employers' needs. Systems that build skills will also have to ensure that these added behavioral attributes are in place (Blom and Cheong 2010). Any realistic attempt to train technical personnel who can meet these various needs for 21st century agriculture must revitalize the knowledge and skills provided by traditional ATVET and VET programs (box 2.11) and reform the governance and management of training colleges and institutes.

INVESTMENT NEEDED

Investment in technical education and training for agriculture has, like investment in all AET, been low. Much recent World Bank funding for formal TVET is industry-related,

Box 2.11 Producing Technical Human Resources for the Agriculture Sector in Australia

In Australia, technicians for the agricultural sector are trained through public and private institutions ranging from comprehensive technical and further education institutes or colleges, specialist agricultural colleges, private companies, to not-for-profit organizations operating as registered training organizations. Australia's six states and two territories have legislative responsibility for education. The national government has become more active in vocational education over the past twenty years, developing a national system for vocational training, providing significant funding to deliver training, and organizing national curricula around the principles of competency-based training.

Each sector of the economy, including agriculture, is covered by a comprehensive suite of competencies known as a "training package." The content of these training packages is based on the needs of the economy and industry, which are communicated through Industry Skills Training Councils.

Source: Agrifood Skills (<http://www.agrifoodskills.net.au>) and Cameron Archer (Principal, Tocal College, Paterson, NSW, Australia; see cameron.archer@industry.nsw.gov.au and www.tocal.com), personal communication, 2010.

The council covering vocational training in the agricultural sector, Agrifood Skills Australia, was established in 2004 as one of 11 Industry Skills Councils to provide accurate industry intelligence on current and future skill needs and training requirements for the agrifood industry. Agrifood is a public company with an industry-led board of directors and industry advisory committees. Funding is provided under contract by the Department of Education, Employment, and Workplace Relations. In New South Wales (NSW), Tocal College is a Registered Training Organization within the NSW Department of Primary Industries (DPI). A trademarked brand name—PROfarm—is used for all short courses for farmers run by DPI technical specialists through Tocal College. Attendance at PROfarm courses from the third quarter of 2009 to the second quarter of 2010 was 4,309, and the projected income was 862,377 Australian dollars. Full-time courses at this college have a 90 percent completion rate.

and recent projects supported in China and India reflect this trend.¹ In both countries, projects were designed to meet growing deficits in the availability of skilled workers, particularly in engineering and IT. These investments reflect the economic importance of engineering, manufacturing, and IT in both economies.

Innovative aspects of more recent TVET projects outside agriculture include:²

- Greater industry involvement in defining training standards.
- Development of public-private partnerships that enable costs to be shared.
- Creation of attachments and apprenticeships (see module 4, TN 2; and module 5, TN 1).
- A change in focus from training inputs to training outcomes (that is, competency-based training).
- Encouraging life-long learning by offering modular curricula that enable learners to enter and exit and continue to upgrade skills.
- Making the shift from teacher-centered to learner-centered pedagogy.
- Seeking accreditation for programs.

In Africa, these innovative aspects can be seen in Ethiopia, where TVET is provided to the agricultural sector under the management of the Ministry of Agriculture and to other sectors through the Ministry of Education and the Regional Education Bureaus. A 2004 World Bank Post-Secondary Education Project included a small component for TVET innovation to expand and deepen system reforms spearheaded by the Ministry of Education. Agriculture was not included in the project, but the project's five pillars of TVET transformation would be a good fit for vocational training in agriculture: (1) decentralization of service design and delivery; (2) strengthening partnerships among stakeholders, especially between training providers and employers; (3) development and implementation of a trades testing and certification system; (4) cost sharing by beneficiaries; and (5) an orientation to market-based demand to shape training.

A 2006 World Bank project in Ethiopia, the Rural Capacity Building Project, included an agricultural TVET component. The Project Appraisal Document notes that "capacity-building of middle-level technical workers is an important factor in the drive to enhance productivity, stimulate economic competitiveness, and raise people out of poverty." Implementation of the TVET component is encountering some difficulties, in part due to the lack of cooperation between the Ministries of Agriculture and Education and between central and regional governments.

POTENTIAL BENEFITS

The presence of skilled agricultural technicians has the potential to strengthen all links in the agricultural value chain and lead to still other benefits:

- Greater productivity and efficiency in public and private entities employing technically educated and trained graduates of the AET system.
- A VET system that is networked with stakeholders in the public and private sectors and with civil society organizations (CSOs).
- Well-crafted and successfully implemented policies to guide VET for the agricultural sector.
- Financing of TVET/VET on a sound footing that includes public and private contributions and fees levied on trainees or their sponsors.
- Assured quality of TVET/VET through certification of courses and programs by internal and external accreditation bodies.
- TVET/VET pedagogy that reflects a student-centered approach to learning, coupled with attachments and work experience opportunities with stakeholder enterprises, farms, and CSOs.
- TVET/VET networked with other parts of the AET system.
- Well-qualified and high-performing graduates of TVET/VET enrich the AIS through their interactions with a variety of actors in the system.

Investments in the production and upgrading of technical sector specialists ensure that the continued modernization and growth of agriculture and its numerous areas of focus meet the needs of a public sector that requires technicians to disseminate technology and undertake regulatory functions; of a private sector that invests in agribusiness, input supplies, and domestic and international marketing; of farmers' associations and cooperatives that represent producers; and of consumer organizations that rely on food supplies that are fresh and healthful.

Skilled technicians would also have the potential to be self-employed entrepreneurs who, in turn, create rural employment and serve as role models for farmers and others with whom they interact in the AIS.

POLICY ISSUES

A major policy challenge is to arrive at an agreed formula for financing TVET/VET. Should the public sector fully underwrite such education and training, or should

employers and students share the costs? Given that stakeholders' involvement in describing the real needs of the labor market has been minimal and that the standards set by VET entities have been poor, the private sector has had little incentive to share the cost. Incentives for cost sharing emerge only when programs and courses meet labor-market needs, standards of education and training are high, and education and training entities are flexible and responsive to change.

Aside from policies that improve TVET financing, policies must ensure fair and equitable recruitment of students/trainees from all segments of society and seek a gender balance that reflects societal structure and labor-market needs.

Policies are also needed to support more effective governance of TVET. Such policies would formalize stakeholders' contribution to the content and focus of curricula and programs. They would also clarify the roles of ministries and regional bureaus in a decentralized education system and end the administrative paralysis that stems from poorly defined roles.

Policy guidance is also needed to ensure that apprenticeship and attachment programs are well designed, that responsibilities of TVET/VET entities and hosts are clearly defined, and that evaluation of student/trainee performance is fair and open. Finally, policies must guide TVET/VET entities to seek accreditation or certification for their education and training programs and courses.

LESSONS LEARNED

Supply-driven VET for agriculture has not been very successful for a number of reasons, including: weak or absent links to employer stakeholders; the poor quality of graduates resulting from inappropriate curricula and the poor availability and quality of teachers and instructors; intermittent funding; poor governance of the VET system; and the related absence of good policies to guide VET. Courses are rarely certified and competencies rarely tested, with the result that only a low value is placed on the VET system and its products.

Another lesson is that divided ministerial responsibility is a primary source of poor support for and performance of VET entities (just as it is a fundamental problem for all public agricultural education). For example, the ATVET component of the rural capacity project in Ethiopia proved difficult to implement because of poor coordination and cooperation between the Ministries of Education and Agriculture at the national and regional levels.

Policy to remedy this and other weaknesses of agricultural vocational education cannot be formulated in a vacuum. A precondition for sound policies is the development of a clearly expressed and understood needs statement from the concerned stakeholders. Policymakers must be convinced that technician education and training, if performed to a high standard, will produce graduates who will contribute to the productivity of the agricultural sector. To clarify the demand for and content of vocational education and training, key sector actors need to be involved in a series of dialogues. The key actors include ministries of education and agriculture, employers of graduates from TVET/VET, and staff and administrators of education entities that offer programs and courses that educate and train technical personnel for the public and private sectors.

Clearly, the sustainability of a quality VET system is based on its utility to the labor market. If the system produces graduates that are needed and valued by stakeholders, resources will be made available by those stakeholders. The VET system must be underpinned by clear and supportive policy that defines the role of VET; guarantees public sector financial contributions to VET; clarifies the roles and contributions of stakeholders who employ graduates of the system; and spells out the structure of the governance arrangements for the VET system.

The diverse and fragmented nature of the agricultural sector robs it of the high-profile, high-energy features of modern high-technology industries that generate jobs, export earnings, and strongly pressure decision makers to support education and training for those industries. Evidence of this phenomenon can be seen quite clearly in the lopsided investment profile in technical education and training in recent times.

RECOMMENDATIONS FOR PRACTITIONERS

By and large, developing countries have neglected TVET for the agricultural sector, but the time is right for new instruments to support the human resource needs of modern agriculture. Successful investments in ATVET require innovative governance and technical approaches, but they have high potential for making positive contributions to sector productivity. Recommended steps and considerations include:

- Initiate dialog with key stakeholders to clarify needs and expectations and share supply capacity and constraint information and data.

- Invest in dialogue with major stakeholders to arrive at a widely understood and supported view of the importance of TVET/VET.
- Involve stakeholders in high-level governance of ATVET.
- Create a shared and well-documented message for decision makers to get policy and material support for VET.
- Encourage decision makers to clarify responsibility for TVET. Is TVET solely a public responsibility, or is responsibility shared with the private sector?
- Undertake a collaborative assessment of labor-market needs and expectations from the TVET/VET system.
- Obtain agreement on funding for TVET, based on documented needs and stakeholders' expectations. For example, TVET could be funded through public-private partnerships that provide private support in cash or kind (equipment, facilities).
- Invest in the capacity of teachers and instructors; it is important for the viability of TVET.
- Begin with a small number of good courses or programs that meet stakeholders' most important human-resource needs.
- Form an active network with other TVET and VET systems and, when resources allow, undertake study visits.
- Ensure that TVET/VET is linked to AET.
- Encourage cross-sector dialogue, because agricultural TVET/VET is often linked to other sectors' programs and development plans.
- Seek certification of all TVET programs to ensure quality.
- Include environmental considerations in the preparation of technicians for agriculture, because the sector is recognized as a major contributor to pollution and environmental stress. Programs and courses for technicians should identify the issues of concern and underline the need for environmental sensitivity on the part of their graduates. The environmental focus of the curriculum would be examined in certification and accreditation exercises undertaken by internal and external bodies.