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Modernizing Vocational Technical Schools to Develop a 21st Century Credentialed Work Force

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Introduction

The increased importance of value-chain development strategies requires a new approach to designing post-secondary agricultural education and training (AET) to meet skills requirements of developing economies. To produce highly skilled graduates, AET curriculum reforms need to be based on the labor markets of agricultural value-chains. The published literature on the best practices for AET reform indicates that aligning AET graduates' knowledge and competencies to the labor demands of value-chains is best achieved through partnerships with industry, work force credentials, equal gender opportunity, and professional development of teaching staff.

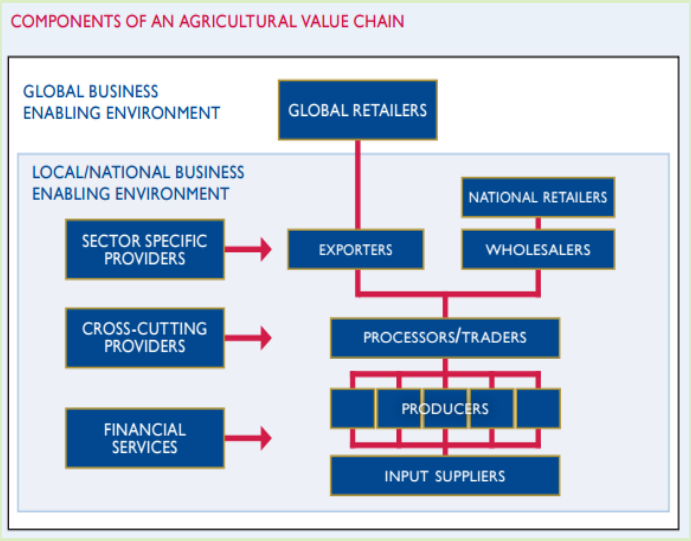
Aligning AET to Value-Chains

Since the late 1980s, value-chains have become an important concept in agricultural development. Agricultural development historically focused on intensifying production through research development programs such as the Green Revolution. A value-chain point of view widens that focus to include developing pre- and post-production aspects of the agricultural industry.

The diversifying labor markets associated with strengthening value-chains demand a corresponding shift in AET curriculum. Transitioning beyond traditional curriculum focused solely on production is required to align AET with value-chain labor needs. Reforming curriculum to match labor market demands of value-chains will contribute to more authentic work force development.

Competencies, Knowledge, and Skills

As part of the curriculum reform process, the AET profession needs to analyze the competencies required by value-chains to create relevant training programs. The process of identifying the skills required for all the components of a value-chain requires a collaborative process.



A value chain encompasses the full range of activities and services to bring a product or service from seed to sale in end markets, where each successive "link" in the chain adds value to the product or service. Thus, a value chain includes input suppliers, producers, processors, traders and buyers, supported by a range of technical, business and financial service providers.

(U. S. Agency for International Development, Bureau for Food Security, 2013, p. 94)

At the local level, stakeholders must assess the work force needs. Through skills gap analysis AET training can be realigned for programs offered at the local technical school to meet market needs. An iterative process including the technical schools and actors from across the agricultural knowledge system is required to identify the gaps in knowledge and competencies required in the agricultural industries. Educators must identify knowledge and skills in the current educational programs. This needs to be reviewed and discussed with stakeholders within the value-chains. A comparison of outdated knowledge or skills is made, given that the industry may have new technologies in use.

> **Professional competence is seen as the generic, integrated and internalized capability to deliver sustainable effective (worthy) performance (including problem solving, realizing innovation, and creating transformation) in a certain professional domain, job, role, organisational context, and task situation.**
>
> (Mulder, 2014, p. 111)

The second iteration needs to identify the gap in current industry practices and what is not integrated into the technical school curriculum. Prioritizing the level of use of a knowledge or skill by graduates highlights those training areas most needed by a graduate as he/she enters the job market. The employers participate in the iteration, however, they rate the quality of the graduate by indicating those knowledge areas or skills and the level of proficiency of the newly hired graduates entering their enterprises. These two analyses collectively provide the basis for realigning curriculum to current labor market needs. The co-creation of this knowledge and competencies list should include discussions of those parts of the curriculum taught in schools versus the opportunities for internship experiences within the enterprises as the preferred location for work-based learning.

As part of the design, key aspects of an AET program to analyze include the capacity of teaching staff, gender data, up-to-date and diverse types of equipment, quality of apprenticeship programs, entrepreneurial training and strength of partnerships with local businesses.

Key Interventions

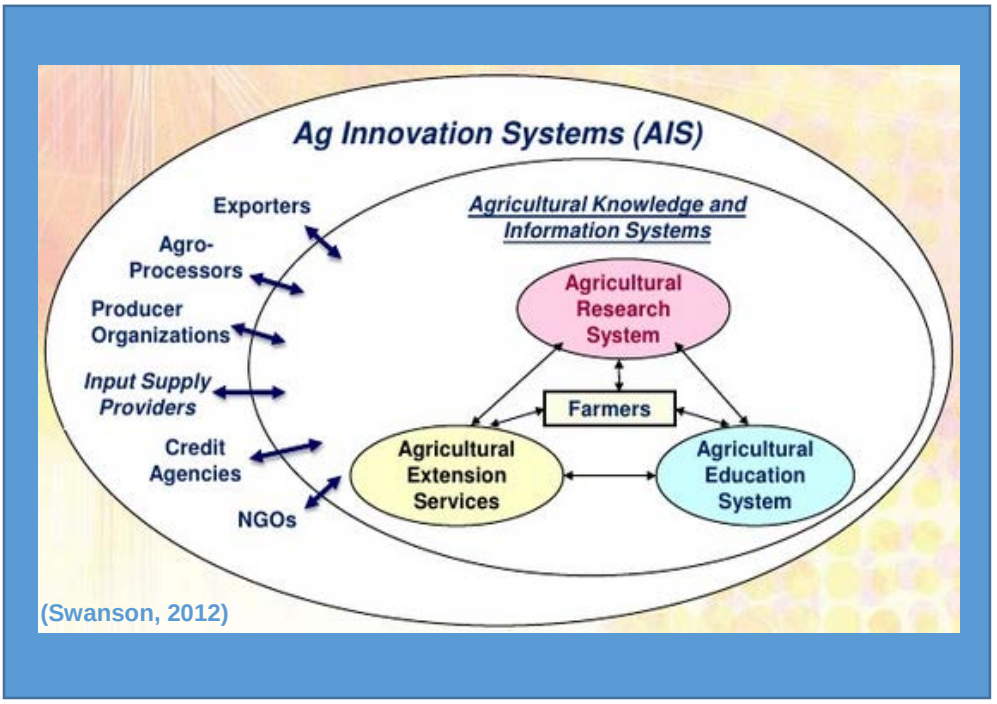
Partnerships with Value-Chains

Partnerships between AET institutions and agribusinesses enhance AET in many ways. Partnerships bring the agricultural innovation system (AIS) together. Opportunities are created which authenticate a skills gap analysis; contribute to professional development of teachers; co-create work force credentials; and structure apprenticeship programs. Partnerships can expand educational facilities, enhance educational services, improve operational services, augment management and professional services (Atsumbe, Emmanuel, Owodunni, & Bargu, 2013). Partnerships comprised of a diversity of stakeholders increase the variety of perspectives and opinions among teachers, employers, and human resources staff for program design (R. Mishra, Alseddiqi, & Pislaru, 2009).

Credentials for workforce development serve two purposes: program certification or acquiring proficiency of defined competencies. AET systems are a part of the wider AIS. Training credentials, developed jointly with stakeholders within the AIS, should be more relevant to the labor market needs. As such, vocational credentials built via strengthened linkages between the agricultural education system and varied sections of value-chains, like input suppliers and agro-processers, will create a stronger labor force for industry and a more valuable education for AET graduates. The diagram which follows shows the Agricultural Innovation System inclusive of the private sector enterprises that contribute to the overall functioning of the AIS. To be successful, credentials require strong collaboration from professional associations, practitioners and scientists with oversight by government regulatory agencies.

Partnerships can be a positive factor for professional development of teaching staff by providing opportunities for teachers to gain hands-on experience through site visits, workshops, and industrial attachments. Industrial attachments can be components of formalized professional development or in the form of a sabbatical.

Partnerships also contribute to entrepreneurial training. Most AET teachers are limited in their effectiveness in teaching entrepreneurship because of a lack of first-hand experience. Partnerships with local entrepreneurs give students a more accurate sense of both the hard and soft skills required for starting a new business or applying entrepreneurial skills.



(Swanson, 2012)

Entrepreneurship Training for Value-Chain Development

Entrepreneurship training is important for both the well-being of students and for value-chain development strategies. Training in entrepreneurship has positive effects on a nation's entrepreneurial activity (Nkirina, 2010). Encouraging the entrepreneurial spirit in young people develops value-chains by creating a more competitive business environment. This is particularly important in developing countries and in countries with high youth unemployment (Nkirina, 2010; Ogowewo, 2012).

Even for students who do not go on to start their own businesses, entrepreneurship training teaches valuable skills including soft skills like managerial skills (Ogowewo, 2012). It creates lifelong learners who are more resilient to the rapidly changing skills requirements of dynamic labor markets.

Work Force Credentials

Credentials for AET graduates improve the value of their degrees by developing standards alongside industry stakeholders. Work force credentials indicate professional proficiency. Using criterion referenced assessments, credentials are more meaningful to prospective employers because it indicates skill levels achieved. Credentials make AET more attractive to students, and AET graduates more attractive to employers.

Employers have a financial incentive to participate in the creation of credentials. They are best positioned to articulate the skill requirements of their work force. Therefore, developing credentials via partnerships is critical to meet their employment needs with well-trained employees. In addition, credentials co-created with stakeholders within the AIS maintain the current value of AET.

Gender Equity

Gender equality is important on both human rights grounds and for economic reasons in value-chain development strategies. Women around the world face restriction from accessing education, particularly in technical-vocational education and training (Masri, 2009), limiting their economic output. Young women face many hurdles when making career decisions, including those posed by culture, social norms, religious beliefs, discrimination, curriculum bias, poverty, sexual harassment, and violence.

AET institutions often have far fewer programs for traditionally female-dominated fields, and women feel discouraged from participating in male-dominated fields. Therefore, AET is typically built as a male system without a female equivalent.

Lack of confidence in math and science subjects diminishes female participation in math and science fields and is often cultivated in girls throughout primary and secondary school. Mentoring and gendered guidance counseling help give girls the confidence necessary to enroll and succeed in male-dominated subjects, as well as lessening gender-based isolation and alienation.Moreover, entrepreneurship training as discussed above is particularly beneficial to female students. It helps women to overcome unemployment, unfair wages, and discrimination in the labor market (Masri, 2009).

Print and television media representations of AET fields have often exclusively portrayed men, causing both male and female students to internalize messages about gender roles. Intentionally portraying females in vocational fields, as well as publicizing examples of successful women, sends more inclusive messages, changes perceptions, and provides role models for girls.

Gender equality is a systemic issue. Equality in postsecondary AET cannot be achieved without equal opportunities for women before and after postsecondary school. Without full female participation in primary and secondary schools that effectively work to reverse gender biases, women will not enroll in technical schools. Without equitable employment opportunities and compensation, women will rightly find little value in AET.

Aligning AET in Morocco

In 2008, the Ministry of Agriculture and Maritime Fisheries began to implement the Green Morocco Plan. In this strategic plan, the government made the commitment to develop agriculture using a value-chain approach; there are 19 value-chains.

In support of the program, the creation of interprofessional associations which are a form of collective organization occurred. These interprofessional associations co-ordinates the member's action in order to ensure common objectives are achieved. In Morocco, these associations are involved in research and development, improvement and upgrading of quality of products to meet market demand. They consolidated the links across the pre-, production, and post-production segments of the value-chain.

This structure within the agriculture sector provides the network of stakeholders critical to all aspects of the agricultural innovation system. Not only is there the value-chains and interprofessional associations, the Kingdom of Morocco has 52, two-year technical schools found in all regions of the country. Together these entities are the basis for the partnership described in this thematic brief. The stakeholders would be able to create the process for analysis of knowledge and competencies for each value-chain. The partnerships are key to identifying the gaps in training and prioritizing based on the structure of each value-chain (input supply, financing, processing, production, and marketing) the components and credentials for AET required to support the sector.

AgriCorps is an NGO working to promote youth agricultural entrepreneurship through 4-H programs as a co-curricular part of secondary schools. AgriCorps members, who must be former 4-H or Future Farmers of America members, serve a minimum one year term as a teacher, advisor and extension agent in a community in Ghana. Home-based entrepreneurship projects are taught to students using school facilities. AgriCorps members facilitate linkages between students, local markets and input providers. Through home entrepreneurship projects, students are able to establish an income-generating enterprise and learn business skills in school.

To promote gender equality, The Pandit Sunderlal Sharma Central Institute of Vocational Education in Bhopal, India created both informational and motivational videos that included interviews with successful women entrepreneurs. The school also initiated research and developed linkages with industry. In one instance, industry representatives were brought to the school and were "surprised by the confidence level of girls and agreed to employ them."

(Mishra, Khanna, & Shrivastava, 1999)

Professional Development of Teaching Staff

A well-trained, professional teaching staff is critical to valuable AET programs. The goal of professional development is to improve teacher effectiveness (Paleocrassas et al., 2009). Effective professional development programs combine content and pedagogical training. Where either is lacking, professional development can be designed to address the skills gaps of that particular system.

Public-private partnerships contribute to meaningful professional development programs by providing industrial attachments for instructors. Industrial attachments help teachers to stay up to date on rapidly changing industrial practices, provide concrete examples for instruction, and help teachers to build the relationships that aid in finding internship placements for students or opportunities for field trips (Stier, 2001). Companies have even provided instructors to work together with teachers (Mustapha, 2001).

Quality formalized professional development programs include active learning principles. Active learning encourages teachers to reflect on their practice, identify weaknesses, and test new ideas (Ingvarson, Meiers, & Beavis, 2005).

Conclusion

AET reform aims to create a work force development strategy that is responsive to dynamic changes in labor markets. Implementing these recommendations requires a combination of a supportive national policy environment and private industry cooperation. The partnerships between value-chains and AET institutions are in the best interest of all parties to actively participate to carry out AET reforms. The partnerships must work to analyze competency needs in the work force, compare skills and knowledge gaps existing between educational programs and industry while assessing the proficiency of students and prioritizing the work force skill needs of the employer. As part of this effort, rethinking policies to sustain technical education programs in AET programs is necessary. The foundation of these reforms centers on entrepreneurship training, gender equality, work force credentials and professional development of teachers. These interventions can be a driving force for meaningful AET reform that supports national value-chain development goals by providing a competent and credentialed work force.

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