



# InnovATE Study: Agricultural Education and Training System in Tajikistan

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#### Disclaimer

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## Executive summary

The purpose of this report is to outline the current capacity of the Agricultural Education and Training (AET) system in Tajikistan, identify the drivers of change in supply of and demand for the agricultural workforce, and to identify strategic and appropriate investments that could help strengthen the human and institutional capacity of the AET system. The population of Tajikistan is largely rural, and agriculture remains the single largest employment sector in the country. The economic performance and impact of agriculture has decreased over the past two decades, but agriculture continues to contribute to economic stability in growth in Tajikistan. Post-Soviet restructuring of the economy, as well as land reforms, have shifted agricultural production patterns away from large-scale farming, and toward small-scale, diversified farms. There have been moves over the past 15 years to liberalize land markets, repair and expand irrigation infrastructure, and identify opportunities for diversification and economic growth in the agricultural sector. Several agricultural value chains, including fresh and extended season fruits and vegetables, have been identified and targeted as having the potential for both domestic trade and export growth. It is therefore important to characterize the skill needs and gaps in the agricultural workforce serving and supporting smallholder agriculture in Tajikistan, and to identify investments in the AET system that could help address these gaps and strengthen the agricultural workforce across the value chain.

The goals of the study are:

- To characterize the current capacity of the AET system in Tajikistan.
- To analyze the skills gaps in the AET system between current supply of AET graduates and current and projected workforce demands for skills needs in the agricultural sector.
- To identify good practices and recommendations for development of Tajikistan's AET system.

The main findings of the study show:

- That there are high levels of human capacity in the AET system. Knowledge is outdated but there is interest from individuals in updating their knowledge and teaching skills. However, the material and resource base of the AET system is extremely weak.
- The current generation of students in the AET system does not have adequate skills training, and employers are demanding both diverse and interdisciplinary skills, and also the ability to link technical training to real-world problem-solving. Graduates' training is highly technical and the emphasis on specialization limits their ability to work in the diversified agricultural and market systems that are emerging in Tajikistan.
- There is much interest from international donors in building human capacity for the agricultural system in Tajikistan, and there is a large amount of support committed to reforming educational institutions and support infrastructure improvements.
- The AET system in Tajikistan is not currently able to absorb large amounts of institutional or infrastructure investment. However, there are many opportunities for small investments in human capacity and the material base of the AET system institutions.

## Abbreviations

ACDC – Agrarian Career Development Center

AET – agricultural education and training

Bokhtar – Bokhtar Agricultural College

DSU – Dangara State University

GDP – Gross Domestic Product

GOTJ – Government of Tajikistan

HICD – human and institutional capacity building

Mastchoh – Mastchoh Agricultural College

PITTU – Polytechnic Institute of Tajik Technical University

QSU – Qurghonteppa State University

TAAS – Tajik Academy of Agricultural Sciences

TAU – Tajikistan Agrarian University

TUT – Technological University of Tajikistan

USAID – United States Agency for International Development

## 1. Introduction

Agriculture in Tajikistan has gone through major transitions since independence from the former Soviet Union. The population of Tajikistan is largely rural, and agriculture remains the single largest employment sector in the country; however, the economic performance and impact of agriculture has decreased over the past two decades. Post-Soviet restructuring of the economy, as well as land reforms, have shifted agricultural production patterns away from large-scale cotton and wheat farming, and toward small-scale, diversified farms. There are opportunities to modernize and strengthen the agricultural sector, but these will require overcoming environmental, institutional and human capacity challenges. Formal agricultural education and training (AET) institutions can be key players in the modernization of agriculture in Tajikistan if they can develop the capacity to better serve the growing need for highly qualified professionals in the agricultural workforce.

USAID/Tajikistan requested assistance from the Innovation for Agricultural Training and Education (InnovATE) project to provide specialized and strategic thinking on how to build capacity in the formal AET system that is relevant to the current and future needs of agriculture in Tajikistan. InnovATE is a USAID/Washington-funded project supporting the capacity development of agricultural training and education systems at all levels, from primary school through secondary institutions as well as youth programs, vocational education and training schools, and universities. The InnovATE program, implemented by a consortium of U.S. universities led by Virginia Polytechnic and State University and including Pennsylvania State University, Tuskegee University, and the University of Florida, aims to strengthen the range of institutions that train and educate agricultural professionals.

The total agricultural area of Tajikistan is roughly one-third of the country, but this includes permanent (tree) crops and pasture land. Arable land for field crops is roughly 6% of the country's total area, and much of this has been underutilized for the past 25 years. Agricultural land and arable land areas have both increased slightly over the past ten years, largely due to repairs and expansions of the irrigation infrastructure. The World Bank (2014c) estimates, however, that only two thirds of the land equipped for irrigation is in use because of the remaining poor infrastructure, further decreasing the amount of arable land in the country. Because of the necessity for irrigation and the relatively slow increase in irrigation infrastructure, agricultural efficiency and the economic return of agriculture have decreased over the past ten years. However, agriculture continues to contribute to economic stability in growth in Tajikistan, accounting for roughly 20% of annual gross domestic product (GDP) and comprising 45-66% of the labor market (World Bank, 2014c; Eurasian Development Bank, 2013). There have been moves over the past 15 years to liberalize land markets, repair and expand irrigation infrastructure, and identify opportunities for diversification and economic growth in the agricultural sector. Several agricultural value chains, including fresh and extended season fruits and vegetables, have been identified and targeted as having the potential for both domestic trade and export growth (Feed the Future, 2012).

Within Tajikistan, the continued role that remittances play in boosting GDP and household incomes means that domestic demand for high quality produce and livestock products continues to increase. Internationally, economic growth in Russia and continued interest in economic integration through a Customs Union could create opportunities for Tajikistan to increase agricultural exports if it can identify

key demands. The World Bank (2014c) identifies stone fruit, both fresh and dried, and onions, fresh and dried, as products and value chains that can be expanded for export to Russia and Turkey. Feed the Future (2012) adds tomatoes, cucumbers, early potatoes and cabbage as well. These and other vegetable crops could easily be cultivated in extended and winter season greenhouses, in order to capture higher prices for off-season produce both domestically and across the region. Value chains could be further developed if processing facilities for juice and wine are repaired or established, in order to create higher value fruit products (Shtalovna, 2013). However, recent economic decline in Russia has the potential to drastically reduce demand for Tajik exports. An additional challenge to establishing and expanding international export markets will be the ease with which trade occurs between Tajikistan and specific partners. For example, export of food products will be increasingly difficult as countries like Russia adopt food safety standards and harmonize regional trade tariffs that prioritize economic integration (Coulibaly, 2012). These value chain opportunities and the challenges associated with them provide an entry point for identifying labor market skills needs for employment in agriculture.

In addition to impacts that agricultural exports and imports have on national GDP, the agriculture sector provides employment for 45-66% of the workforce in Tajikistan. Agricultural employment in the formal sector includes ownership and management of an individual or collective dehkan farm, wage labor (primarily in cotton), work in the transport and processing sectors, and increasingly work in various private and public extension services. Employment opportunities in emerging agricultural value chains require a range of skills that have not historically been taught within the AET system, due to the segmentation and specialization that characterized the Soviet education system. In addition, skills taught in agricultural colleges and universities in the past were oriented toward the large-scale farming that characterized the Soviet period. With the agrarian reforms of the past ten years, agriculture in Tajikistan now looks very different. All actors in agricultural value chains, from farmers and farm workers to input dealers, food processors and those in marketing and export, need updated skills and new types of training. The AET system must adapt to and reflect the new agricultural conditions in Tajikistan to

This report first outlines the institutions and structure of the AET system in Tajikistan, and identifies diversity and equity issues related to geography, gender and socioeconomic status. The report then identifies key drivers of change in the agricultural sector in Tajikistan, and highlights the skills gaps and needs in emerging agricultural value chains. We then offer an analysis of the current strengths, challenges, and opportunities within the AET system, based on the interviews conducted by the InnovATE team in February 2015 (see Appendix 1 for a full list of the institutions and organizations visited). Based on this analysis, the report then identifies good practices in AET system development that could be relevant to the current AET system in Tajikistan. Finally, the report offers suggestions for areas in which investments can be made to strengthen and build capacity in the AET system.

## **2. AET system in Tajikistan**

There are seven higher education institutions in Tajikistan that offer at least one agricultural specialty at the bachelor's degree level. In addition, there are two vocational colleges that offer agricultural specialties at the technical degree level. The Tajik Academy of Agricultural Sciences (TAAS), a national



research institution that focuses on agriculture, also has a training program for Master's and Ph.D. students. Table 1 lists the institutions that offer agricultural specialties (the equivalent of majors in the U.S. system) and their enrollment levels. All estimates include both day and correspondence students. In total, we estimate roughly 10,000 students are currently studying agricultural fields at the college (technical degree) and university (bachelor's degree) level. Estimates from TAJSTAT (2012) and the recent World Bank (2014a) assessment of higher education suggest that there are currently roughly 190,000 students enrolled in higher education (college and university levels) in Tajikistan. This means that only 5% of students in post-secondary institutions are studying agriculture.

**Table 1. AET institutions in Tajikistan**

<b>Institution</b>	<b>Total number of students</b>	<b>Students in agricultural specialties (percentage female)</b>	<b>Agricultural specialties offered</b>
<b>Higher Education Institutions</b>			
TAU	7,659	7,659 (7%)	All specialties are agricultural
TUT-Dushanbe	2,200	450 (n.d.)	Food processing
QSU**	13,000	n.d.	Ecology (pedagogy/teacher training) Biology (pedagogy /teacher training)
TUT- Kulyab	1,610	543 (15%)	Agrotechnology
DSU	2,153	498 (4%)	Agronomy Food storage and processing technology Agronomy, economy and management Technology, economy and management Livestock product storage and processing Technology for natural fibers Technology for synthetic fibers
TUT-Isfara	500	174 (70%)	Food industry
PITTU-Khujand	3,200	200 (30%)	Agrotechnology
<b>Technical Colleges</b>			
Bokhtar	423	423 (8%)	Agronomy Dehkan farm operations technician Agricultural machinery technician Veterinary technician Accounting
Mastchoh	494*	494 (5%)	Agronomy Mechanics Accounting Veterinary
<b>Agricultural Research Institutions</b>			
TAAS	n.d.	n.d. (30%)	All areas of agriculture

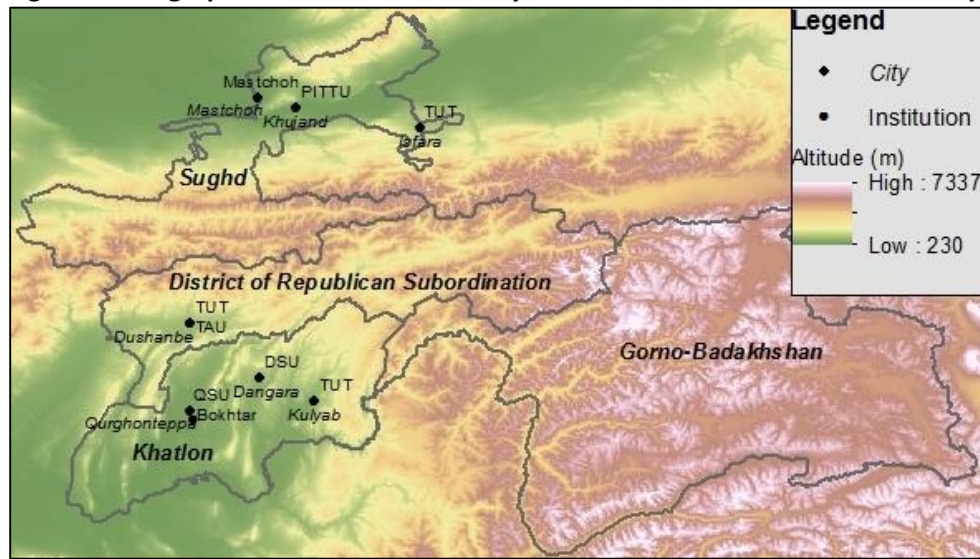
\*More than half of these students are in the correspondence program

\*\*QSU is a regional teacher training university with high enrollment levels. QSU has two specialties, Ecology and Biology, which have some overlap with agriculture.

Figure 1 shows the geographic distribution of the AET system institutions identified and visited during this scoping activity. To the best of the InnovATE team's knowledge, the list of AET institutions in

Tajikistan that are presented in Table 1 and Figure 1 is comprehensive. There are no agricultural secondary schools or TVLs in Tajikistan, although some TVLs include training in trades that could be used in agriculture, like machinery repair or construction. There are three technical colleges that train secondary school teachers to teach science, which could include agriculture. However, these colleges (in Rudaki, Jabor Rasulov and Zafarabad districts) do not provide any training for agricultural production or for agricultural professionals, and so they were not included in this study.

**Figure 1. Geographic distribution of AET system institutions visited for the study**



*Baselayer data from DIIVA-GIS, authors' representation*

The geographic distribution of AET institutions shown in Figure 1 presents challenges for rural student access to social and financial resources. If students want to study agriculture, they must go to either Tajik Agrarian University (TAU) in Dushanbe, or Dangara State University (DSU). If these are not their home areas, students are less likely to have family and social support networks, which might discourage their parents from supporting them. All of the state university rectors with whom we spoke emphasized that though they have students from all regions of the country, most of their students come from the region and districts directly surrounding the universities. The lack of agricultural specialties and faculties at most state universities limits students' ability to choose these career paths. A particularly glaring gap in geographic equity within the AET system is the lack of any agricultural university in the entire Sughd Region. Aside from the two individual specialties in food processing at the Polytechnic Institute of Tajik Technical University (PITTU)-Khujand and Technological University of Tajikistan (TUT)-Isfara, there are no other options for students to study agricultural fields in Sughd. This is especially detrimental to agricultural development since much of the food production and agricultural value chain activity occurs in Sughd Region.

There is also an added financial burden on those students who choose to study agriculture far from home. The socio-economic equity issues in higher education are interconnected with geography, since the presidential quota system is designed to provide financial support to underrepresented and disadvantaged students from each district of the country. Aside from these relatively few quota

scholarships, there are no other sources of financial aid based on need. Government budget seats are allocated based on student performance, and are the main source of funding for low-income, often rural, students. These scholarships are also one avenue for increasing gender equity in higher education. According to the World Bank (2014a) study, around 30% of students in the higher education system are female. As Table 1 shows, the presence of female students in agricultural specialties at universities and colleges is much lower (around 5-10%). TUT-Isfara and PITTU-Khujand are exceptions, and their higher rates of female students (70% in the case of TUT-Isfara) might be explained by the cultural climate in Khujand, as well as by the desirability of food processing careers to women. In general, however, women are sorely underrepresented, especially at TAU. One possible reason for the lack of female students at TAU is the fact that they would have to live in Dushanbe, which is potentially far from home and less desirable to parents. More generally, most agricultural specialties have historically been seen as male work (much as in other parts of the world), and women are less aware of and supported in pursuing agricultural specialties.

### **3. Drivers of change in supply and demand for the agricultural workforce in Tajikistan**

The primary drivers of change for AET should be the expansion of agricultural value chains. Agriculture is an important sector of the overall economy of Tajikistan, but its importance varies by region. The Khatlon Region accounts for almost 51% of total agricultural output followed by the Sughd Region (28%) and Districts of Republican Subordination (19%). Cotton is still the main agricultural export, followed by dried and fresh fruits and vegetables, which have the potential to take over cotton exports if production is increased and supported with operational value chain development (World Bank, 2014c). The rapidly evolving geo-political situation makes investments in AET critical, to assure continued, improved agricultural production. The country is not only dependent on domestic food production for its own security, but also for the growing demand from Russia and potential new markets in Europe and Asia. Despite the underdeveloped export infrastructure in the country, the economic blockade by regional neighbors (Uzbekistan often closes railroad links for Tajik transit), and costly traditional trade routes to markets (via air), Tajikistan is still an important food exporter to Russia (especially for certain products, such as early season onions, dried apricots and lemons).

#### **3.1 Impact of agrarian reforms**

In the late 1990s, the government started to carry out the transition from the Soviet agricultural policy and structure (large state and collective farms) toward market-based economic and agricultural systems. The dissolution of the over 600 state and collective farms resulted in the creation of over 165,000 small-scale (1-3ha each on average), commercial dehkan farms (World Bank, 2014c). The land reform process in Tajikistan granted producers use-rights and has led to positive, but small, production increases and increased crop diversification. Agricultural reforms have prompted Tajik fledging agribusinesses to explore opportunities outside the traditional export markets (Russia and Kazakhstan). Informants from the Agribusiness Association of Tajikistan indicated that they are seeking ways to enter European markets, which are more economically stable compared to Russia. However, they have also

acknowledged that agribusinesses are poorly placed to compete and need specialized skills (such as food safety and ISO certification) to promote Tajik agricultural products in the new markets.

Farm reorganization and the shuttering of agro-processing facilities from the Soviet era, have both led to value chain fragmentation and downscaling of agro-processing. The current value chains, even for staple foods, are focused on the production side, making the chain shorter and less profitable. Farmers barely reach surplus production due to the lack of technical farming skills and have limited working capital coupled with the lack of economies of scale. The 2013 Rural Investment Climate Assessment, cited in the World Bank's report (2014c), found that only one third of farmers sell their produce to commercial buyers, and 52% of those sell at the farm gate price. On the other side, the small-scale agro-processors and buyers struggle to secure reliable supplies of good quality raw materials while experiencing a constant lack of investment, and weak market links to explore expansion. Moreover, the agribusinesses and processors lack information and technical knowledge in improved processing technologies, modern product standards and food safety (ibid.).

### **3.2 Supply and demand of agricultural workforce**

While Tajikistan has only one agrarian university, we felt that there are far more graduates coming into the labor market than agriculture and related sectors can absorb, given the above constraints and the lack of employment opportunities. The isolation of TAU from the realities in the countryside is exemplified in the outdated curricula and offered specialties, which leads to disappointment upon the students' graduation. Employers do not want the types of graduates currently being produced (World Bank, 2014b). The expansion of greenhouse production and orchards demonstrates that there is a serious lack of workers trained in greenhouse or orchard management, including crop rotation, soil management, irrigation, pest control and harvesting. The lack of skilled labor leads to reduced production levels and poor quality products. The farms are less likely to be profitable, and investment in the sector is not encouraged. This situation indicates it is time for investment in modernizing the facilities and training of the agricultural labor force. To be fair, it is difficult to supply appropriately skilled and ready to work graduates well matched to the demands of the sector if the employers and the AET system do not communicate, and are constrained by government control. It will be important to seek ways that employers can communicate skills needed to the AET sector, solicit their response and encourage the students toward market-oriented skills acquisition.

Agriculture and careers in agriculture are perceived to be limited to agricultural production and agricultural production management. This mindset was found during focus groups with students, informal conversations with the general public, and to a lesser extent with some academic staff and administrators. In Tajikistan, there is little understanding that agricultural employment includes the vast array of employment opportunities along a comprehensive value chain (see Table 2 for value chain jobs needed) or includes any notion of entrepreneurship. The goal of most students seemed to be a government job or migration to Russia. At the tertiary education levels, faculty members were likewise unaware of employment opportunities throughout the value chain and were simply educating students in basic science, using traditional methods of pedagogy, presumably for centralized, planned economy jobs. Although everybody acknowledged that "new farmers" never farmed before and lacked substantial

technical skills, thus the search for jobs to serve this new generation of mixed and small-scale farmers were not considered. This could be due to several factors: first, that new farmers cannot afford hiring the graduates because of their production constraints, second, the lack of operational value chains, and third, the mistrust among farmers that TAU and related institutes produce skilled and experienced graduates who can immediately assume their responsibilities.

The focus on agricultural development in Tajikistan is on value chain expansion, which requires workforce development to expand and strengthen each chain in the value chain. Examples of the range of occupations and jobs available and possible in the fruits and vegetable value chains are highlighted in Table 2. Applying a workforce development frame to the value chain then requires identifying the current supply of the agricultural workforce as well as the demand for that agricultural workforce. Comparing the supply and demand in this section then leads to the analysis in the next section, of the current skills gaps in the agricultural workforce in Tajikistan.

**Table 2: Job profiles in the fruit and vegetable (greenhouse) value chain**

Select Positions	Formal education requirement	Skill level required
<b>EXPORT PRODUCTION</b>		
Harvest worker	No formal education required	L
Tractor/truck operator	License/certification	L-M
Greenhouse builder	License/certification	L-M
Chemical spray technician	Technical education	M-H
Irrigation technician	Technical education/BSc	M-H
Quality control	Technical education/BSc	M-H
Farm consultant	BSc/MSc	H
<b>PACKING AND COLD STORAGE</b>		
Packing worker	No formal education required	L
Labelers	Secondary school	L-M
Transport driver	License/certification	L-M
Managers (line/shift)	Technical education	M-H
Inspector	Technical education	M-H
Packing manager	BSc	H
Quality assurance manager	BSc/MSc	H
<b>PROCESSING</b>		
Line workers	Secondary school	L-M
Mechanics & machinery maintenance	Technical education	M-H
Production supervisor	BSc	H
<b>EXTENSION AND ADVISORY SERVICES</b>		
Extensionist	Technical education	M-H
Field consultant	BSc/MSc	M-H
KEY: L Low, no formal education; experience L-M Low-Medium, secondary school; experience M Medium, technical education, certification M-H Medium-High, technical education/undergraduate degree H University degree and higher		

*Adapted from Fernandez-Stark, Bamber and Gereffi, 2011, p. 54.*

### 3.3 Skills gaps and needs in the agricultural sector in Tajikistan

A number of informants noted a lack of entrepreneurial skills training in general in Tajikistan. Few students have the vision or the opportunity to pursue entrepreneurial ideas while in school and once out of school, do not have the skills to do so. One strategy would be to help graduates learn how to start a business - whether it is for profit or not for profit. TUT-Dushanbe presented the InnovATE team with examples of how they prepare students with entrepreneurial skills, by focusing on English-language skills and information technology use to engage with emerging economic value chain opportunities. Employers also note that students do not have adequate hands-on and practical training to build skills that are applicable in the context of changing production systems in Tajikistan. For example, there is a lack of good extension and advisory services available to farmers at all but the largest production levels. At the same time there are wide gaps in technical skills and confidence of agricultural graduates to meet the extension needs of the smaller farmers. The employers acknowledged that AET graduates learn about production from a theory perspective, but don't have the practical skills or experience to operate a farm business. Farmers, especially those that specialize in greenhouse production and orchards, need skills in marketing to promote and sell their output. They also need technical advice in modern production, harvest and storage technologies, and processing equipment. Finally, export-marketing skills in particular are in big demand. For the Tajik agriculture sector to be competitive especially in export markets, it needs to have employees that understand and possess skills in business planning, efficient processing, international marketing, and communication skills, including foreign language skills.

Other areas of skills gaps also reflect the changing agricultural and economic sectors in Tajikistan. Many farmers reside in rural areas where families are intergenerational and extended. In addition, out-migration of men from rural areas caused feminization of agriculture in Tajikistan (Mukhamedova and Wegerich, 2014). Women work as farm labor to weed, harvest crops, grow their own crops in the household plots, as well as process harvests into canned fruit and vegetable preserves for wintertime. Family and consumer sciences skills in nutrition, food preparation, family economics and natural resource management can benefit these women by creating job opportunities for them as well as improve rural standards of living. Many families also own a few cattle and small ruminants (sheep and goats), the skills in home economics with regard to livestock rearing and dairy processing could significantly increase female's participation in the livestock industry. Finally, the World Bank report on skills for employability (World Bank, 2014b) highlighted the need for skills to support the evolving domestic and international markets. They noted the need for high degree analytical and interpersonal skills in knowledge-intensive activities and services to support technological, business and trade activities in the country, which are also relevant to agriculture if efforts are put to intensify production and processing. The report also calls for "new economy" skills, which will be needed to support investments in the food industry and services such as credit or insurance services for producers and agribusinesses.

Interviews with employers noted several key areas where they find recent graduates lacking in their skills upon graduation from secondary and tertiary education. There are several reasons for these skills gaps. Teachers and professors teach as they were taught, have heavy teaching loads, with little time or reward for innovation in the classroom. In addition, they work with inflexible curricula, which don't

allow creative thinking. Employers are slow to communicate back to educators what skills they want to have in the graduates they hire. In addition, the limited availability of internships and practicums with the private sector ensures that only a few students have these opportunities. The job market in the agricultural production and value chains is ill-defined noting that not all jobs are in rural areas, and not all agriculture graduates work for farmers. The lack of career guidance, lack of communication from employers on skills they require, and the lack of discussions about career possibilities, prevents an expanded vision of the agricultural sector's employment opportunities. There is a failure to recognize the different employment opportunities inherent in each type of agricultural production, processing and marketing sectors and the need to tailor training and education of the workforce to the needs of those segments of the agricultural labor market. The skills needed are wide-ranging in skill levels (from basic pruning to export licensing), level of education (primary through tertiary including vocational), location (rural, urban, and international) and disciplines (agronomy, marketing, agribusiness and entrepreneurship).

#### **4. Strengths, challenges and opportunities in AET system in Tajikistan**

In this section, we summarize the strengths, challenges and opportunities in the AET system in Tajikistan, in light of the skills needs and gaps outlined in the section above. Tajikistan has a strong history as an agrarian country, which is the strength for the burgeoning private agricultural sector. The country takes pride in this history and many understand that road to increased economic growth for the country begins in the rural areas. The current land reforms that are being implemented will help move the country towards a market driven system. Many Tajik producers and agribusiness have been successful in producing goods for global markets, building and extending agricultural value chains. These strengths are offset by several challenges related to supporting the AET system to be flexible and responsive to changes in the agricultural sector and the skills in demand for the agricultural workforce in Tajikistan. There are also several opportunities to build on the strengths and address the challenges in the AET system in Tajikistan.

##### **4.1 Strengths in the AET system**

The strengths that we identified in the AET system in Tajikistan are in fact very strong. The Government of Tajikistan (GOTJ) has a strong focus on supporting agriculture. Several people we spoke to in the MOES and at universities all mentioned the need to support the education of future agricultural professionals. The GOTJ wants to see the AET system produce better graduates who are ready to work to improve the agricultural system in Tajikistan (see GOTJ, 2012, for the national education strategy). Another clear strengths of the AET higher education institutions is the many individuals who are dedicated to education. The AET system in Tajikistan has a long and deep history of preparing students for the workforce. Many of the faculty and students we met expressed the reason they are focused on agriculture is to help develop their nation. The faculty we met with talked about how their teaching and research should help producers be able to use current technology to improve production. The idea that the AET system should support production is deeply engrained in the institutions. At the same time, there are individuals within the AET system in Tajikistan who know the system needs to reform. Many of



these individuals spoke about how they want to see the AET return to producing graduates with the skills required for the current rural marketplace.

As agricultural value chains continue to emerge and expand in Tajikistan, the types of skills and training necessary for a diversity of jobs also continues to expand. Table 2 above identifies the educational levels most appropriate to different types of jobs in fruit and vegetable value chains, and demonstrates the need for agricultural education across the pipeline, from secondary and vocational education to tertiary and post-graduate levels. The college and vocational education institutions are especially well-placed to play a key role in improving the economic viability of smallholder agricultural producers and to extend agricultural value chains in Tajikistan. The technical colleges have a history of producing skilled tradesmen with practical skills that are needed in the rural areas. The college faculty who were interviewed as part of this study expressed their desire to be able to once again produce the skilled workforce that is needed for their local community. Faculty at technical and vocational lyceums noted that many students are interested in gaining skills in a trade in addition to an upper secondary education. Since many of these students are the children of newly minted dehkan farmers, there is interest from both students and faculty to strengthen trades and courses that can support agricultural development.

Another strength of the AET system is the current climate for investments in Tajikistan, with considerable support and funding being funneled into education reform by the international community. The end result of these investments will hopefully be more autonomy for all educational institutions in Tajikistan. There are several “bright spots” in the AET system that support the types of change required to revitalize the system. Key individuals are interested in seeing more foreign language training, increased connections to the private sector and improved curriculum/pedagogy. All actors in the AET system and the private sector support the idea of Tajikistan developing a functioning extension and short-course training system. It is clear that individuals within the AET system have relevant local knowledge that would be useful to producers. In addition, AET system academic staff is all looking for ways to supplement their current low income. A key strength of the AET system is the presence of human resources, and the private sector has expressed the need for extension education. In addition, there is a strong interest among researchers at TAAS and TAU to link their work and knowledge to farmers.

## **4.2 Challenges in the AET system**

The InnovATE team identified several challenges in the AET system in Tajikistan. The current agricultural production systems in Tajikistan are still in transition, and will likely not be the agricultural system in Tajikistan once the agricultural reforms have fully taken place. For example, many people with whom we spoke talked about the necessity of creating a system to transfer land-use rights among holders, so that farm size can be expanded and economies of scale achieved. It is important that the AET system prepare now for the future changes. Instead of preparing to be responsive to a new form of command economy, the AET system needs to prepare how to be responsive to the emerging local trends as well as the global marketplace. The AET system still reflects the centralized Soviet educational and pedagogical model, making it difficult to adapt specialties, curricula and teaching approaches to the changing agricultural



and economic sectors. The slow pace of agricultural reform in Tajikistan has prolonged the period of time during which the country has had neither the Soviet command economy nor a free-market based economy with clear market signals. The AET system is stuck in a unique place where there are few true free market signals to which to respond for curricula and skills development.

The main internal challenge facing the AET system is the lack of autonomy that the institutions have in all aspects of the educational process, from curriculum development to accessing financing to engaging linkages to the private sector that strengthen relevance. For example, the curriculum approval process means that investments in curriculum reform must accompany investments in the material base of the institutions, in order to meet the government requirements for acceptance. In addition, the AET institutions are so underfunded and under-resourced that it is impossible for a single donor to take on this reform without a coordinated effort from other donors. The system is currently not capable of absorbing a major investment. The lack of funding and resources is the largest challenge that universities, colleges and vocational schools face. It seems that the current resource levels perpetuate the stereotype that agriculture education leads to careers that involve working as farm labor for low pay. One of the clearest indicators of the neglect was the fact the libraries in the colleges were full of old Soviet texts in Russian but less than 20% of the current college students speak Russian. TVLs are in much the same position, with weak physical infrastructure and little relevant teaching material.

Another challenge for AET system is that unlike the strong history in training students for the workforce, the AET system has little to no experience in extension education. In fact, the private sector feels it is more profitable for them to provide extension services and short-course trainings directly to producers, and do not involve the AET system in short-term training. However, a curriculum for extension specialists is currently being developed based on a GOTJ decree, to be based at TAU. In a similar manner, the international donor and project implementing community do not see a role for the AET system in delivery producer training. This approach leaves the AET system completely on outside of training capacity development work being done by many donor-funded projects. In addition, the AET system does not have a history of working closely with the private sector, and has historically been focused on teaching students theory and doing research that advances theory. Applied research based on demand from the private sector is not part of their history.

The higher education system faces several external challenges that work to limit the capacity of the AET system to recruit students and be responsive to the private sector. Many of the educated Tajik people do not view agriculture as a viable career, and those who receive agricultural degrees often do not end up working in agriculture. Because a large majority of students at the key AET institutions are on government scholarships, they are required to take low-paying job assignments upon graduation that might not reflect their specific interests or career goals. These perceptions are real and will need to be challenged if the AET system is going to recruit higher quality students. Impeding this type of change is the fact that connections between AET institution and the private sector has not been developed. Today, the AET system is receiving their curricular and skills development direction from GOTJ ministries in a manner that is very similar to the methods used to direct education under the Soviet system. The connection between AET institutions and the private sector will need to be established, while autonomy

of the AET institutions from the GOTJ must be increased if the AET system is going to be a relevant player in a market-based agricultural system.

A second challenge for the development of private sector capacity to employ the agricultural workforce is that agrarian reforms are ongoing and not yet complete. All land in Tajikistan is the property of GOTJ with producers having use rights that are not easily transferable, which limits innovation and adaptation by dekhon farmers. It is also challenging for the private sector to find quality experts in the workforce that was educated after the collapse of the Soviet system. The AET system is simply not producing graduates with the right set of skills for the mixed and smallholder farmers nor the market economy. At several meetings, the private sector and the AET system talked about how short the agricultural value chains are in Tajikistan. The private sector is working hard to fully plug into global markets but the process is challenging because the business environment does not fully support private enterprises and the available workforce does not have the required skills. In addition, regional instability is blocking important trade routes to major markets or causing delays that impact the profitability of exporting. Both the GOTJ and domestic businesses have little experience with negotiating and working with international markets, and not have complete information about foreign market demand upon which to develop export-oriented value chains.

### **4.3 Opportunities in AET system**

There are several opportunities within and around the AET system in Tajikistan on which reforms and investments can build. The private agricultural sector continues to grow, and will be a growing source of employment for agricultural professionals with a range of skills. Most conversations about agricultural exports involved increased access to Russian markets. Russian consumers know the quality of agricultural products grown in Tajikistan. In addition, the agro-climatic conditions allow Tajik goods to be the first on the market in comparison to neighboring countries. The silver lining to the large number of diaspora who are returning from Russia to Tajikistan is the fact these individuals have been exposed to different systems and gained new skills while working outside of the country. The returning diaspora have the potential to be a boost to the private sector. A related opportunity is interest from regional and international investors in developing new agro-industries in Tajikistan, including a textile factory in Dangara and fair-trade and organic certification to supply specific relationships with Europeans food processors. Finally, if agrarian reforms continue in Tajikistan, market mechanisms and price signals will begin to penetrate the country and farmers will be able to respond to these cues.

Opportunities also exist to prepare key faculty and students in a manner that will improve their human capacity in the short term and the institutional capacity in the long term. There are individuals within all AET institutions who are open to change. These individuals could be exposed to new training and pedagogy that will focus on developing their problem solving and critical analysis skills. This training will build the human capacity so in the future when major institutional capacity activities occur, these individuals will be in place to provide leadership and help create local solutions. There are also opportunities to increase relationships with the private sector by utilizing the student practicum requirement as a way to connect students to real-world experience, and in turn to feed that experience back into the classroom. In addition, there is higher and higher demand from the private sector for

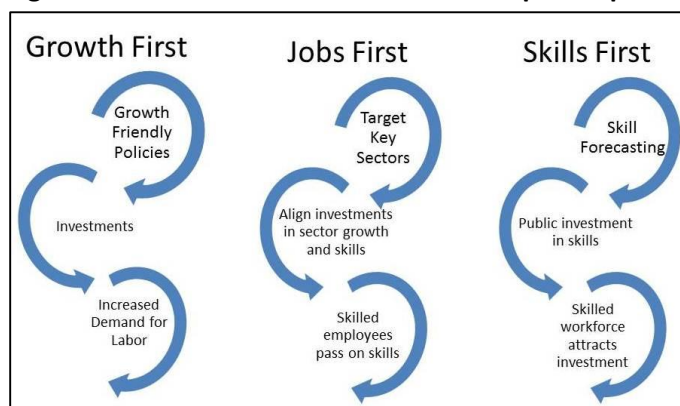
technicians who can install and maintain new technologies. Members of the private sector seem to prefer to hire college graduates because of their willingness to work in rural areas and work directly with farmers.

The main external opportunities for the AET system in Tajikistan come from the international donor community and the global market place. The international donors are targeting higher education and primary vocational education and training for major investments and reforms in the next few years (these projects are listed in Appendix 2). The international donors are interested in making changes to structural governance and financing, as well as to curricula and material resources. These changes will help build capacity in the AET system increase flexibility and connections to the private sector. Several international donors are interested in supporting the primary vocational system and helping technical and vocational lyceums become more relevant to workforce development. There are also many opportunities in that international donors are very interested supporting the development of an extension service. Many parts of the AET system want to develop the capacity to do extension work. Due to the increase in the number of farmers and in diversity of crops being produced on larger parcels of land, there are numerous demands for the extension services. Different international and private-sector projects are working to develop both fee-based and free (subsidized) extension service capacity in Tajikistan.

## 5. Good practices in AET system development in Tajikistan

In this section we offer reflections on good practices in AET system development that could be relevant to the current context in Tajikistan. The InnovATE project works within an overarching workforce development framework to support capacity building in AET systems. Rural workforce development is typically approached via one of the three paths. Each of the paths can lead to improved coordination between the job market and the workforce; however, it easy to overlook the role of the AET system in each of these three paths. Figure 4 presents the three models of growth first, jobs first and skills first workforce development. In this section we present some options on how best the AET system can be used to support rural workforce development in each of the three paths.

**Figure 4. Three common workforce development paths**



The growth first model is a private sector led model. In this path, the government creates a growth friendly policy environment, the private sector makes investments and then a new demand for skilled workers is created. In this model, the AET system would be at the end of this process and produce the skilled workers that are demanded by the private sector. In the growth first path, institutions at all levels of the AET system will need to be able to quickly change their curriculum, add new programs and provide training on a timetable that is focused on keeping the private sector functioning. The jobs first path advances workforce development by advancing current capacities. This path starts by finding the logical next steps to expand and extend key sectors that are currently functioning in an economy. Once the next level of skills is identified, the private sector investments in job creation and public sector investment in education and training work together to produce the skilled employees. The goal is to have the newly trained workforce available in time for private sector demands. This system would require an AET system that works in close cooperation with the private sector and has the flexibility to change curriculum and trainings in coordination with the private sector. The skills first path is based on the idea that the private sector is willing to invest in an area when the location has a properly trained workforce. This path requires a strong central agency that can complete accurate skills forecasts and can align the skills training system to produce a workforce with these skills. The private sector will then invest in a location once the trained workforce is in place. This path requires an AET system that can change based upon the demand of the central authority.

Regardless of the path to workforce development, it will be necessary to support human and institutional capacity development (HICD) within the AET system to as a part of the process. Within the context of USAID programming, HICD is defined as “structured and integrated processes designed to identify root causes of performance gaps in host country partner institutions, address those gaps through a wide array of performance solutions in the context of all human performance factors, and enable cyclical processes of continuous performance improvement through the establishment of performance monitoring systems” (USAID, 2010: 7). It is paramount that the AET system in Tajikistan begins the process of improving system efficiency to improve the agricultural system in Tajikistan. The path forward for HICD activities in Tajikistan will benefit from focusing on the local context and key individuals, and by employing a modular approach to curriculum development that can remain responsive and flexible.

HICD training works best when the majority of the training is focused on local solutions and held in the local environment. Trainings that pull individuals out of their environment can also be successful, and have been a key feature of many of the HICD efforts of international donors in Tajikistan in the past, by supporting faculty and student exchanges. However, there is an increasing awareness of the benefits of having the trainings within the local environment helps both the implementers and the trainees adapt the training to local conditions and create an institutional platform that can continue after donor funding ends. HICD training should initially focus on key individuals who are open to the idea of change. Not everyone in the AET system in Tajikistan will welcome the idea of HICD, nor will everyone have the same ideas about what changes are needed. Since the AET system has had so little exposure to the ideas of HICD, it would be best to work with the most progressive faculty and administrators to build specific

problem-solving and facilitation skills. Once the ideas of HICD are presented to key individuals, they will be able to slowly engage the broader AET system in conversations about change.

HICD training is most effective when it is responsive to local needs and adapted to local conditions. In addition, HICD projects have been successful when the training was flexible enough to be responsive to locally identified needs. The modular methodology for education, training and reform supports the end goal of engaging the HICD training participants play a key role defining training topics. Therefore, the implementing agency will need to be able to respond to the local needs, and to develop modules that meet specific, local needs of AET system individuals and institutions. Working with institutions and individuals to modularize a portion of their curriculum can get individuals to begin thinking about different knowledge delivery models. Modularization of a portion of the curriculum works best when the AET system works with the private sector to identify the specific parts of the curriculum that best meets the current training needs of the private sector. If completed successfully, private sectors might be willing to pay for this training and could open up a new revenue stream for the AET system.

## **6. Recommendations**

The results of this study suggest that AET system in Tajikistan is not ready to absorb a multimillion dollar investment in infrastructure or curriculum development because it does not have the human or institutional capacity to absorb an investment. A major concern of the InnovATE team is the AET system is currently under-valued and under-resourced within the educational and occupational context of Tajikistan, and is at risk of falling even farther behind, to the point of becoming irrelevant. This is particularly true for TAU, the only agricultural university in the country, and Bokhtar and Mastchoh Agricultural Colleges. The loss of the capacity and potential at the university and technical college levels would greatly limit the possibilities for agricultural development and growth in Tajikistan, as these are the only institutions with curricula focused on the production side of agriculture. Building the human capacity of TAU and college faculty and students over the next few years will support the process of strengthening institutional capacity to engage with education system reforms as they begin to occur. Building the capacity of TAU, faculty and college students, many of whom will go on to work in the agricultural sector, will also strengthen the institutions that demand change from the AET system, further emphasizing the need for AET system reforms.

### **6.1 Agrarian Career Development Center at Tajik Agrarian University**

The InnovATE team proposes the establishment of the AET-system wide Agrarian Career Development Center (ACDC) that will train both students and reform-minded faculty and administrators on innovative models of teaching, learning and problem solving. The ACDC will slowly prepare the human capacity to be able fully process and adapt the ideas for institutional capacity. The ACDC will work to capacity in key individuals throughout the AET system. These individuals will then become the local, internal change agents that will drive institutional reforms. The ACDC takes a realistic approach to HICD in the AET system in Tajikistan by focusing first on developing soft skills and supporting innovative individuals within the institution. Building human capacity now will position the AET system institutions to better capitalize on structural and institutional reforms that are hopefully coming down the pipeline. In

addition, the ACDC takes a modular approach to training, by identifying discrete skills and concepts upon which to focus ongoing but segmented training activities. With proper support and investment, the ACDC will strengthen the agricultural workforce through training future graduates and young faculty, who will be the next generation of agricultural experts in Tajikistan.

The goal of the ACDC will be to build the human capacity necessary to capitalize on donor investments in institutional and systemic reform now and in the future. For example, the World Bank Higher Education Project will first work to reform some aspects of the higher education system at the ministry level, paving the way for a more flexible and decentralized curriculum development process. The Higher Education Project has then proposed to follow its efforts at systemic change with a grant program for institutional capacity building through curriculum development and modernization. The faculty training and experience that will occur within the ACDC will build the human capacity necessary to make TAU and the agricultural colleges able to generate competitive, innovative ideas for institutional change when the opportunity exists. The ACDC will also help TAU, the agricultural colleges and the agricultural faculties at other universities extend and expand the updated curricula and courses being taught at the primary VET level. And in turn, sending students into the field to engage in community development work will leverage donor investments in local capacity building and will help link future agricultural experts to demand for their skills in the field.

## **6.2 Other scenarios for AET investment**

Funding a semi-independent training center within an existing institution is a cost-effective strategy for building human capacity and laying the foundation for institutional capacity building. It is also a way to incorporate jobs-led workforce development into the educational system. Developing, staffing and maintaining a center does have costs however, and it is not the only way to invest in the AET system in support of similar goals of HICD and jobs-led workforce development. Small investments could be made in publishing updated teaching materials in the Tajik language. Stipends could be provided for students to do their practicums with field-based NGOs that might not have the funds to cover their expenses. Small applied research grants could be made to university faculty to conduct research relevant to smallholder farmers, with the condition that results must be published in formats suitable for students and farmers. Other investments in the short-term that would support HICD include updating technologies and expanding practice facilities for various faculties at TAU and the agricultural colleges.

Long-term investments in the AET system will require the combined efforts of donors, the GOTJ and the private sector. Donors are currently focused largely on building the educational pipeline, from primary and secondary school through primary VET. At the other end of the system, there are major efforts in the works, largely through the World Bank and the GOTJ, at reforming the entire higher education system. These reforms will provide myriad opportunities for HICD in the AET system, from curriculum reform to updating pedagogy to increasing engagement with the private sector to better meet workforce demands. Without incremental investment in human capacity and the material base of the AET system in the short term, however, these long-term investments will be less likely to effect the kind of institutional change that is necessary for the AET system and agricultural production in Tajikistan to diversify.

## 7. Conclusion

Agriculture remains an important sector of the economy of Tajikistan as a whole, and an important source of rural livelihoods, and food and nutrition security in rural areas of the country. However, the skills needed to work in agriculture are changing, as the structure of agricultural production has moved away from the highly specialized, large-scale farms of the former Soviet Union, to small diversified family and commercial farms of today. The AET system is not currently equipped with the material or human capacity to address and supply the changing skills demand in the agricultural sector, in part because of low levels of investment in AET since the end of the Soviet Union. However, several opportunities exist to support complementary financial and expertise investments by the GOTJ, the international donor community and the private sector to build capacity in the AET system.

Based on the assessment presented here of the current skills gaps between demand for and supply of an agricultural workforce, and of the current capacity of the AET system to adapt to meet these gaps, this study concludes that the most realistic avenue to increase the capacity of the AET system is to invest in human capacity. Building human capacity of students, faculty and administrators through short-term training, updated training in soft skills, and the creation of updated teaching materials will have both short-term and long-term impacts. In the short-term, those students and faculty with an interest in innovation and change will be better equipped as members of the agricultural workforce with the skills necessary to improve agriculture in Tajikistan. Over the long-term, building this human capacity within AET institutions will embed individuals within these institutions who have the capacity to visualize local solutions when opportunities for change begin to emerge. As the international donor community begins to focus on improving the efficiency of the education system in Tajikistan, there will be a few opportunities for the AET system to benefit from the programs. An investment in the human capacity of the AET system will prepare the institutions to take full advantage of the upcoming programs.

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## Appendix 1: Schedule of Appointments

Date	Activity	Location
Sat.-Sun., Feb. 7-8	Travel to Dushanbe	To Dushanbe
Mon., Feb. 9	In-briefing with USAID mission In-briefing with Ministry of Education	Dushanbe
Tues., Feb. 10	World Bank Tajik Agrarian University	Dushanbe
Wed., Feb. 11	Technological University of Tajikistan World Bank Tajik Academy of Agricultural Sciences	Dushanbe
Thurs., Feb. 12	FAST (Farmer Advisory Services Tajikistan) project Tajik Agrarian University National Agricultural Training Center	Dushanbe
Fri., Feb. 13	Sarob meeting Agribusiness Association of Tajikistan National Association of Dehkan Farms	Dushanbe
Sat., Feb. 14	Tajik Agrarian University	Dushanbe
Sun., Feb. 15	Recap of first week	Dushanbe
Mon., Feb. 16	Travel to Qurghonteppa Bokhtar Agricultural College NGO “ Nuri Khatlon” Vocational Technical Lyceum	Qurghonteppa
Tues., Feb. 17	State University of Qurghonteppa Travel to Kulyab	Qurghonteppa
Wed., Feb. 18	Khatlon Livelihood Support Project (IFAD) Agricultural Training and Advisory Center Technological University of Tajikistan Food processor	Kulyab
Thurs., Feb. 19	Dangara State University Travel to Dushanbe EU Delegation	Dangara/Dushanbe
Fri., Feb. 20	FAO GIZ meeting (Technological University of Tajikistan) JICA (Serena Hotel)	Dushanbe
Sat., Feb. 21	Work on report	
Sun., Feb. 22	Travel to Khujand	Khujand
Mon., Feb. 23	Technological University of Tajikistan	Khujand
Tues., Feb. 24	Polytechnic Institute of Tajik Technical University Neksigol/Sugdagroserv Mastchoh Agricultural College	Khujand
Wed., Feb. 25	Work on report JICA agricultural survey team	Dushanbe
Thurs., Feb. 26	Prepare for out-briefing	Dushanbe
Fri., Feb. 27	Out briefing with mission Out briefing at USAID	Dushanbe
Sat., Feb. 28	Depart Dushanbe	

## Appendix 2: Donor investments related to the AET system

Donor	Project title	Timeline	Total budget	Activities related to AET	Education level
WB	Agriculture Commercialization Project	2015-21	\$22 mil	Curriculum modernization (teaching plans) at TAU, focused on small-scale farming needs and commercial agribusiness, correspondence courses to retrain graduates (\$500,000)  Update curricula, facilities and materials at Bokhtar and Mastchoh Colleges, linked to changes at TAU (\$350,000)	University  Technical college
WB	Higher Education Project	2015-18	\$15 mil	Work with MOES on curriculum standards for selected departments or programs that will be key to Tajik economy in coming years  Competitive grant process for innovation and capacity development at individual universities (\$8 million)	University
EU	[exploratory phase]	2016-22	€75 mil	Teacher retraining and professional development for teachers  Buying equipment for selected lyceums to create regional training centers (€1 million)	Primary VET
ADB	Strengthening Private Sector Participation in Technical and Vocational Education and Training	2016-20	\$20 mil	Upgrade 17 trades (including some in agriculture) at 21 lyceums, including physical facilities, teacher training, curricula	Primary VET
FAO	Strengthen Veterinary Education to Enhance Meeting Farmers and Other Stakeholders Needs	2013-15	\$406 K	Invited international consultants to make recommendations on veterinary curriculum at TAU (pending)	University
FAO	Preparation of Agriculture Commercialization Project	2015	\$535 K	Contributing to WB ACP by analyzing ag value chains and extension services to support curriculum development (possibly in extension)	University
GIZ	Professional Education and Training in Central Asia	2010-18	€20 mil	Curriculum development, provision of equipment, teacher training for food processing at TUT	University
IFAD	Khatlon Livelihood Support Project	2008-15	\$15 mil	Consulted with TAU about building research capacity in pasture grass varieties and renovated lab at TAU  Hope to host students from the new pasture specialty at TAU (first cohort entered in 2013) – had no input into the new curriculum	University