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An Establishment of Agroclusters as a key for the development of Agro-Processing Industry in Uzbekistan

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Abstract

The aim of the study is to review the agricultural sector of Uzbekistan with the purpose of identifying the major constraints of development of the sector with special emphasis on fruit and vegetable subsectors, thereby to suggest policy recommendations for the development of the sector. Fruits and vegetables market and its supply chain potential has been studied in case of Samarkand region. Although analysis of recent reforms has provided opportunities for liberalization and modernization of agricultural production and marketing system in Uzbekistan especially for fruit and vegetable subsector, there is still a precondition for sustainable development of subsector. Hence policy suggestions are still in their implementation stage. Specific recommendations were also outlined pertaining to the key constraints identified; namely, pertaining to agricultural production and productivity, quality of land resources, irrigation, reforms, R&D, and agricultural marketing.

Keywords: Samarkand region, agricultural marketing, agro-processing, agroclusters, fruit and vegetable subsector.

1 Introduction and Research Questions

Agriculture plays a crucial role in improvement of rural livelihoods, food security and self-sustainability. Traditionally agriculture has been a strong and relatively stable contributor to Uzbekistan's economy. Between 2000 and 2013, the sector expanded at a robust average annual rate around 7,0 %. Despite this growth rate, however, the sector's share in GDP declined from 32% to 17.6 % between 1995 and 2013, as other sectors of the economy, such as industry and services, grew at a faster pace (World Bank, 2014).

Approximately 60 percent of the value of agricultural production comes from the crop sector and the rest from the livestock sector. Economically cotton is the most important crop in agricultural production, since independence, and as a result of ***the self-sufficiency food policy*** adopted by the Uzbekistan's government, wheat has become the second "strategic crop". It accounts for about 30 percent of the cultivated area. The rest of the cultivated area is used for growing fruits and vegetables (Uzbekistan continues to be one of the major suppliers of fresh and processed fruits and vegetables in the region), in addition to potatoes, tobacco and fodder crops.

Uzbekistan is one of the main producers of fruits and vegetables in the CIS, due to its conducive and very fertile land. It produces a range of high quality agricultural products, from basic commodities such as cotton and wheat to higher value horticultural products such as cherries, pomegranates, and other types of fruits and vegetables. The high quality and wide variety of products with an easy access to the growing Central Asian and Russian consumer markets, as well as vast pool of skilled and inexpensive human resources and wide variety of government incentives are contributing towards the attractiveness of this sector.

However, the processing sector in Uzbekistan has its challenges. Most fruit and vegetable producers in the are small and have low levels of mechanization; the distribution chain is developing, but still needs substantial investments; and quality standards are not uniform across products and producers. Moreover, much of the country's agricultural output goes unprocessed. In season, a lack of adequate packaging and storage facilities causes a large volume of produce to

be released onto the market, and this creates surpluses and steeply falling prices. In the off-season, basic produce such as apples are imported from China and Iran, and often cost up to five times as much as locally-produced fruits cost during the season.

One of the solutions might be through the application of agro-food clusters. The implementation of clustering would contribute a lot to enhancing the competitiveness of Uzbekistan's agricultural and agro-food sector thereby ultimately helping achieve sustained growth of the agricultural industry and improved livelihood in rural Uzbekistan.

2 Data and Methods

A simple definition of a cluster is "the geographical concentration of industries which gain advantage through co-location" (Bosworth and Broun, 1996). A broader definition is "the geographic concentrations of inter connected companies and institutions in a particular field" (Poerter, 1998).

The definitions of cluster have multiplied since the cluster has become popular to pursue a large variety of objectives. While, some emphasize location, some industry sector, and others innovation, ostensive definitions are commonplace: "Silicon Valley", "the California wine cluster or the Italian leather fashion cluster", etc. The common theme is that it is the linkages between firms and other organizations that provide the economic value of clusters (Johnston, 2003).

The study and methodology and techniques are calculated based on regional features such as cultivation, production, processing, and population. The candidate regions for the clustering of agro-food processing special zones are Tashkent, Andijan and Samarkand regions. The estimation formula for the Clustering Coefficient (CC) is demonstrated below (Lee et al. 2013):

$$C_c = C_p * C_s * C_{proc} * C_{pcp}$$

where

C_c - shows the coefficient of clustering potential;

C_p – represents the coefficient of production;

C_s - denotes specialization coefficient;

C_{proc} - indicates processing industry coefficient; and

C_{pcp} - means per capita production coefficient.

The components of each coefficient are given as follows:

$$C_p = \frac{\text{the region's crop production (tons)}}{\text{the average regional production of the crop (tons)}}$$

$$C_s = \frac{\text{the region's share of the crops acreage to its national total acreage (\%)}}{\text{the region's share of the cultivated area to the national total cultivated are (\%)}}$$

$$C_{proc} = \frac{\text{the crop's processed amount in the region (tons)}}{\text{the crop's regional average amount of processing (tons)}}$$

$$C_{pcp} = \frac{\text{the region's share of the crop's acreage to its national total acreage (\%)}}{\text{the region's population share to the national population (\%)}}$$

The estimated figures of Cc, Cp, Cs, Cproc and Cpcp are presented in the Appendix.

Results of calculations by regions show that most great potential of clustering in fruit and vegetable subsector has Samarkand and Tashkent regions, as well as all regions of Fergana valley (Andijan, Namangan, Ferghana). The main activity of the clusters will include production, processing and marketing of fruits and vegetables.

Out of all mentioned regions, three regions with high potential for production and processing of fruits and vegetables were selected as target areas for clustering. In subsequent selection criteria using coefficients of clustering potential Samarkand province was selected for the pilot project for funding by Korean government's KSP (Knowledge Sharing Program) namely, "Development of Agro-Processing Industry in UZ: Korea's Experience and Knowledge Sharing" project.

The main potential cluster areas in the Samarkand region are the eastern districts, such as Bulungur, Urgut, Taylak, Jambay, Akdarya and Samarkand County, which are non-cotton cultivated areas. These candidate districts have high density and share in gross regional product in the region. However, Urgut district is producing roughly 80% of the total tobacco production in Uzbekistan, with most of the irrigated land covered by tobacco and wheat. Only in higher mountain areas of the district household farms are producing fruits like table and dried grapes, nuts, etc. Therefore, this district was dropped from the candidates list. The remaining districts were eligible candidates for cluster in the region, based on population density, surplus of labor forces working for processing companies, shares in regional gross product, conducive land and provision of adequate water.

To determine which district would be more suitable for agro-processing cluster piloting, a further study was conducted to assess the potential of each of these districts to select candidate areas for clustering. Accordingly, Bulungur and Jambay districts were selected as pilot for implementation of agro-based clustering for tomato and apple respectively. SWOT analysis was also conducted for each district.

An establishment of agro-food clusters is thought to ensure the achievement of sustainable agriculture and marketing system. The core principles underlying the clustering concept is networking and creation of value-added products based on R&D.

3 Main Results and Discussions

The current tomato production system does not have stability in Bulungur district. In 2012, a total of 232,160 tons of vegetables was produced in Bulungur district, of which only 2.6 % of these commodities were processed by the processing companies (excluding domestic processing). The total tomato yield in 2013 in the district was 76,090 tons, of which 77.5% was produced by farmers. The total cultivated land area allotted to tomatoes in the district was 2000 ha in the year 2013 (StatUz, 2012).

According to the data of Bulungur's district, farmers' land for tomatoes increased gradually, whereas smallholders' share in land usage didn't change noticeably. However, if we compare tomato productivity, smallholders' efficiency is higher than that of farmers'.

In most cases smallholders grow tomatoes not only for selling, but also for self-consumption and home processing. However, post-harvest losses are lower for households compared to farmers. In most cases, because of high costs of transportation, many smallholders do not have incentives to grow tomatoes for selling.

Farmers, households and agro-processors can get benefit from participating in Agro-clusters. The state is encouraging cluster-based policies to support agricultural units. Clusters are seen as being particularly beneficial for this group, as it allows them to achieve scale economies and share costs related to training, info sharing, and certification and technology application.

The main problem of tomato production in Bulungur district are related to post-harvest activities, as about 25-33% of commodities are lost during post-harvest season. Problems of transportation, unstable contracts between growers and processors and lack of storage houses in rural areas have worsened the postharvest losses. Lack of postharvest research and development programs aimed at generating appropriate postharvest technologies in Bulungur district is also in serious shortage.

Tomato is marketed primarily in fresh form. After collection from the fields, local farmers and household farmers supply domestic markets directly to retailers in Bulungur and Samarkand city. A co-operative marketing infrastructure is lacking. Centralized grading, packing, transit storage facilities, transportation and bulk storage facilities are greatly lacking. The market infrastructure in Bulungur is underdeveloped.

Although most farmers and household farmers in Bulungur district have enough knowledge in growing tomatoes, in most cases, they don't consider the consumer's need for the different varieties of tomatoes. Hence, enhancing the entrepreneurial skills of farmers is necessary. On-farm sorting, pre-cooling, packing and storage facilities for tomatoes are essentially required for distant/export marketing.

Jambay is the district selected as a pilot for agro-processing cluster of apple. There is favorable climatic condition for growing orchards, especially for apple in the district. The district has also several manufacturing companies, including five companies engaged in food processing. Among these the biggest ones are: "Lazzat-Meva" (for processing apple and tomato juices, jams), "Samaoil-Zenit" (for dried fruits), "Samarkand Aqua-Line" (for apple juice, jams, and bottled mineral water). There is also a relatively large number of skilled-labor, with rich experience in growing apples. The government has issued state program that led to abandoning of cotton cultivation in the district and encouraged production of fruits and vegetables. As a result, in 2012 growers in the district started cultivating 300 ha new apple trees. This intensive gardening of apple is a government initiative as part of nation-wide program for establishing intensive orchards.

There is a need to ensure the production of adequate volume and stability of apple production in the district. In particular, government should facilitate smallholders to be integrated in the supply chain of apple in the district. Currently, the share of smallholders in the total production of apple in the district is very low. There is relatively sufficient infrastructure, especially storage facilities. However, these facilities are largely underutilized. Smallholders could be made to benefit by getting the storage facilities. In addition, contract farming arrangements could be implemented between the smallholders and the big producing companies or the owners of the intensive gardens.

As indicated above, 12-15% of apple produced in the district faces postharvest losses. Similar to the situation in Bulungur, there is critical shortage of postharvest technology due to lack of sufficient R&D in producing appropriate postharvest techniques. Although postharvest loss in the case of apple is relatively lower than that of tomatoes in Bulungur, the estimated loss is still significant and calls for similar actions as for tomatoes. In addition, the R&D programs to be implemented at national level should also take apple into consideration in terms of establishing appropriate postharvest technologies.

4 Conclusions

The increased emphasis on intensive gardening in the case of apple, provides an opportunity for economies of scale advantage in availing services of quality control and assurance centrally. Contract farming arrangements between smallholder growers and the bigger producers should also be strengthened.

Since there is lack of a network of local markets, and poor access to market information, National/Regional information networking system should be established. There is also a need to develop market centers at different levels to fill the existing gap in market infrastructure. Last but not least, forging strategic alliances with multinational companies and corporations would enhance the marketability of apple both domestically and internationally.

Ensuring of stable supply of vegetables and fruits requires a long-term approach to processing and distribution rather than a short-term perspective aimed at only increasing production. In particular, strengthening a stable production system coupled with capacity building of farmers is important for smooth implementation of agro-processing cluster. Stability of production does not only entail stability of quantity, but attention should also be paid to ensuring stability of quality of the products. In particular, quality standards are to be maintained for food safety, security and international trade.

Enhancing value-addition in the subsector and expansion of market access could be achieved through such interventions as: promoting commercialization of production, identifying potential markets, promoting private sector participation in agro-processing and value addition, ensuring quality standards, promoting joint-marketing and distribution channels, adopting new varieties and production technologies, adopting efficient processing methods, developing high quality processed food for export markets, supporting processed food, expanding R&D in processing, establishing specialized research institutes and realizing geographical advantages with better understanding of the characteristics of export markets.

Human resource development is required at all levels. Education and training of scientists, processors, extension agents, farmers, industrialists and marketing agents is also required. All human resource programs should consist of long- and short-term activities. Promoting attitude of self-help, cooperation and hard work among farmers and bringing about changes in mental reform is also very important. Provision of extension services and training in postharvest treatment and management to farmers, processors, researchers and government staffs from relevant ministries working in fruits and vegetables subsector is also beneficial.

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Appendix

Calculated Coefficients for Determining the Coefficient of Clustering Potential (C_c)

Region	C_p		C_s		C_{proc}	C_{pcp}	
	vegetables	fruits	vegetables	fruits	vegetables and fruits	vegetables	fruits
Republic of Karakalpakstan	0,27	0,19	0,70	0,50	0,10	0,36	0,25
Andijan	1,77	2,73	1,34	2,07	0,30	1,49	2,31
Bukhara	0,73	1,15	0,61	0,96	0,40	0,97	1,53
Jizzakh	0,47	0,43	0,70	0,63	0,30	0,91	0,83
Kashkadarya	0,66	0,56	0,60	0,51	0,80	0,54	0,46
Navoiy	0,31	0,47	0,54	0,82	0,30	0,77	1,18
Namangan	0,90	0,96	0,94	1,00	2,00	0,86	0,92
Samarkand	2,15	1,76	1,27	1,04	7,20	1,48	1,22
Surkhandarya	1,00	0,70	0,97	0,68	0,10	1,03	0,73
Syrdarya	0,37	0,15	0,76	0,30	0,20	1,13	0,45
Tashkent	2,66	1,06	1,56	0,62	0,60	2,22	0,89
Ferghana	0,94	1,95	0,89	1,85	0,20	0,66	1,37
Khorezm	0,77	0,90	0,95	1,10	0,30	1,07	1,24

Source: Lee et al. 2013