

## AGRICULTURAL PRODUCTIONS IN KYRGYZSTAN, 1990–2014

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## СЕЛЬСКОХОЗЯЙСТВЕННОЕ ПРОИЗВОДСТВО В КЫРГЫЗСТАНЕ, 1990–2014

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**Аннотация:** В этом исследовании мы исследуем сельскохозяйственное производство в Кыргызстане — страна, которая испытала крах прежнего Советского Союза. Кыргызстан - горная земля и вторая самая бедная страна в Средней Азии. В частности, мы исследуем сельскохозяйственное производство с 1990 до 2014 г. Результаты ясно показывают, что инфляция увеличилась существенно за первые два - три года независимости страны. Экономика достигла нижнего предела в 1995 году. Это исследование дает предварительный взгляд на отсутствие продовольственной безопасности и сельское хозяйство в Кыргызстане в период пост Советского Союза.

**Ключевые слова:** Отсутствие продовольственной безопасности, сельскохозяйственное производство, урожай, домашний скот, Кыргызстан

**Abstract:** In this study, we examine agricultural production in Kyrgyzstan—a country that experienced the collapse of the former Soviet Union. Kyrgyzstan is a mountainous land and the second poorest country in Central Asia. Specifically, we examine agricultural productions from 1990 through 2014. The results clearly indicate that inflation increased dramatically in the first two to three years of the country's independence. The economy bottomed out in 1995. This study provides a preliminary look into food insecurity and agriculture in Kyrgyzstan in the post-Soviet Union period.

**Keywords:** Food insecurity, agricultural production, crop, livestock, Kyrgyzstan

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### Introduction

Food insecurity and agriculture continue to be challenges faced by developing countries.

The challenge is enhanced by population growth, urbanization, globalization, international geopolitics, climate change, and other factors

(Dethier & Effenberger, 2012). While the challenge and severity of food insecurity vary greatly across developing countries, countries that have limited arable land and at the same time experience geopolitical instability and dramatic changes in economic structure fare the worst (Dethier & Effenberger, 2012; Gerber et al., 2013).

If a country was in such a situation, how could it survive? In this study, we focus on the Kyrgyz Republic to examine agricultural production since 1990. Despite the multiple food insecurity challenges faced by Kyrgyzstan, there is very limited research on it and other Central Asian countries, partly owing to a lack of data. In this study, we utilize data from the National Statistical Committee of the Kyrgyz Republic and the Food and Agriculture Organization of the United Nations to shed light on agricultural production in Kyrgyzstan.

### Study Area

The Kyrgyz Republic was one of the poorest Soviet states, and some have argued it was one that suffered greatly from the Soviet collapse (Becker & Paltsev, 2004). In 1991, the Kyrgyz Republic officially withdrew from the Soviet Union and established itself as a sovereign state. The rapid transition and economic shocks led to drastic economic decline between 1991 and 1995 (Anderson & Pomfret, 2000). GDP fell by 60% in those four years (Becker & Paltsev, 2004).

In 1996, production of gold and increased agricultural output began to turn things around, though economic development was not equal across the country (Bernabi & Kolev, 2005; Atamanov & Van den Berg, 2012; Anderson & Pomfret, 2000). Around 400 collective state farms were redistributed into thousands of private farms across the population, and crop yield increased on these private farms (Tashmatov et al., 2000; Savastano & Scandizzo, 2009). Farming families worked together and formed smaller collectives to protect themselves from market fluctuations and assist each other in the face of unequal distributions of agricultural machinery and irrigation systems (Sabates-Wheeler, 2007). But even with these improvements, many farming families are among the working poor and only subsist off their production.

### Results

The total agricultural production from 1990–2014 for the Kyrgyz Republic can be found in Figure 1, along with a measure of the portion of GDP contributed by agriculture. Total agricultural production for each year, as well as the subcategories of crop production and livestock production, is measured in tons, while the share of GDP is measured as a percentage.

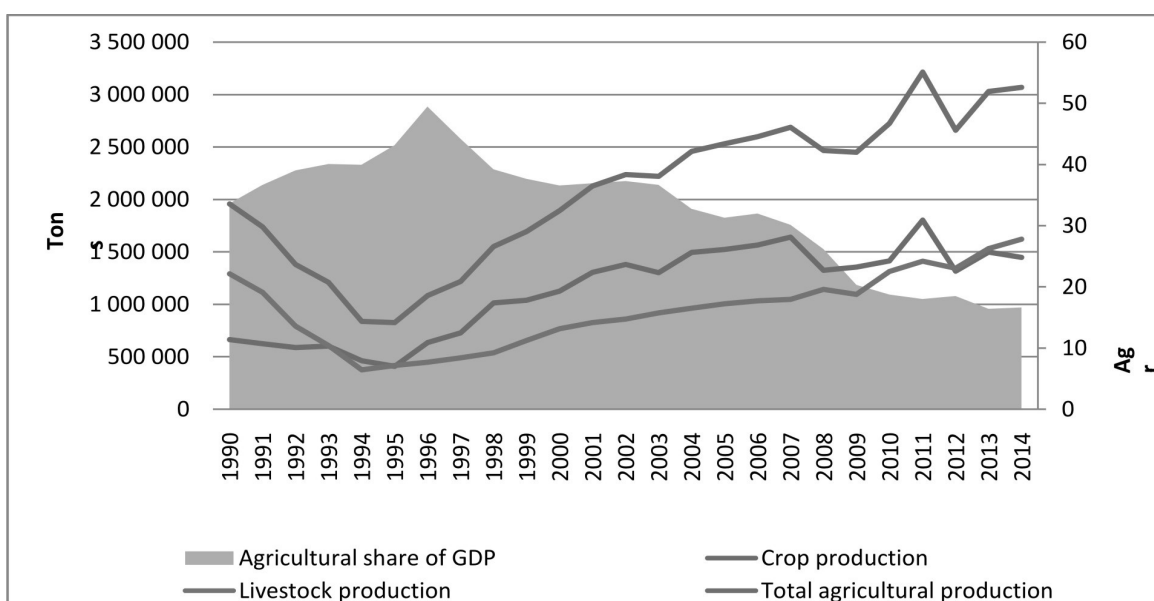
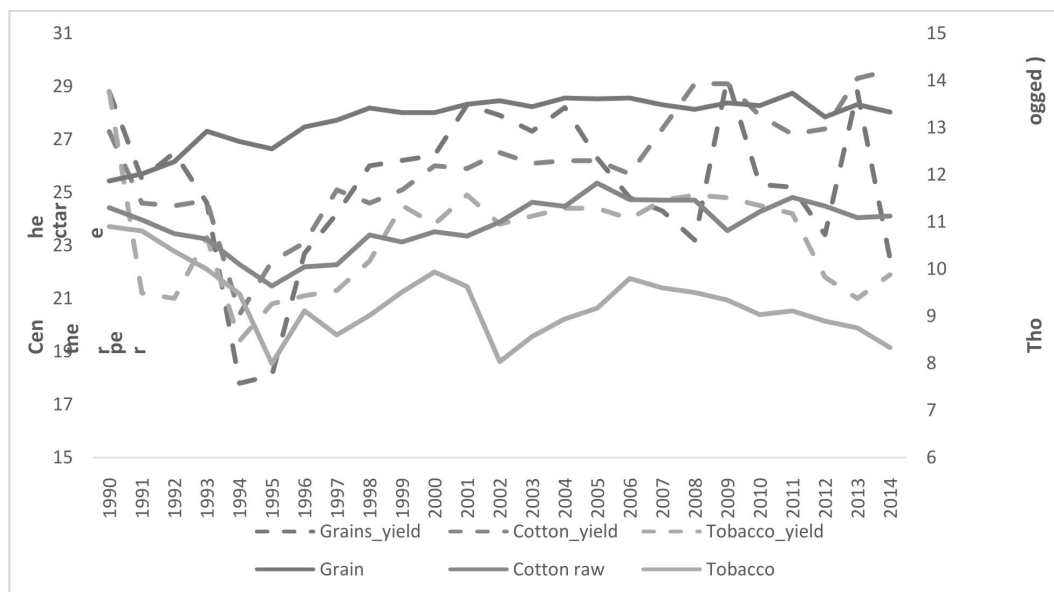


Figure 1. Agricultural Production (Tons) and Agricultural Share of GDP (Percentage), 1990–2014



**Figure 2. Production (Thousand tons) and Yields (Centner per hectare) of Grain, Cotton, and Tobacco, 1990–2014**

In the years immediately preceding and following Kyrgyz independence and the collapse of the Soviet Union, crop and livestock production both declined. Livestock production declined to its lowest—375,268 tons—in 1994. Crop production reached similarly low levels (409,265 tons) in 1995, before production began to rise. Economic, political, and social changes can largely account for these production declines. As part of the Soviet Union, agricultural production in Kyrgyzstan had been interconnected with other Soviet states. The Kyrgyz Republic was once a net importer of many crops and inputs such as fertilizers, but the shift to independent statehood caused an immediate need for self-sufficient production without the infrastructure or inputs to do so (Babu & Reidhead, 2000). During that time, agriculture occupied an increasing share of the Kyrgyz Republic’s GDP. Agriculture accounted for almost half of the GDP in 1996, reflecting the importance of even low production levels in the transitioning economy.

However, after 1995, agricultural production began to rise and continued to rise until the global economic recession in 2007. Crop production dipped during the recession and continues to fluctuate between 1,350,000 tons and 1,800,000 tons in the years after the recession. Livestock production leveled off during the recession years but has since continued on an upward trend. In 2013, livestock production surpassed crop

production, a trend not seen since the formation of the independent state of Kyrgyzstan. At the same time, the share of GDP occupied by agriculture declined to less than 20% in 2014. This trend reflects the concept that increased agricultural productivity frees labor to pursue other forms of production, which some studies have found to aid in development (Dethier & Effenberger, 2012).

To contextualize the changes seen over time for each of the agricultural products, we compared the total production in tons and the yield (measured by centner per hectare) for grains and cash crops (Figure 2), fruits and vegetables (Figure 3), and livestock production (Figure 4). One of the primary goals of agricultural development is the improvement of production efficiency, which means increasing yield (Dethier & Effenberger, 2012). Because the production of the agricultural products are left skewed, to facilitate the comparison, we further transformed the agricultural production into their natural log form.

As illustrated in Figure 2, grain production fluctuated from year to year but had a generally positive trend until 2004. Production then leveled off and even slightly declined in more recent years. Production of cotton and tobacco, cash crops that once had guaranteed markets in the Soviet Union, both decreased until 1995. While cotton production rose and remained fairly stable at an

average of 90,000 tons per year since the turn of the 21st century, tobacco production experienced a generally downward production trend. The yield per hectare does not quite follow the same trend for each of these crops.

Yield of grain crops declined from 1990, to 17.8 tons per hectare in 1994, and remained low in 1995. The yield improved after those transition years but fluctuated in most of the recent years. Cotton and tobacco yields also declined in the early

1990s and only gradually improved over time. Interestingly, cotton yields eventually surpassed their original rates, with 29.6 tons per hectare in 2014, but grain and tobacco yields did not reach their original production rates.

Figure 3 shows that fruit and vegetable production and yield followed similar trends to each another in the early 1990s. Potatoes and “other vegetables”—a catchall category for unspecified vegetable crops—dipped to their

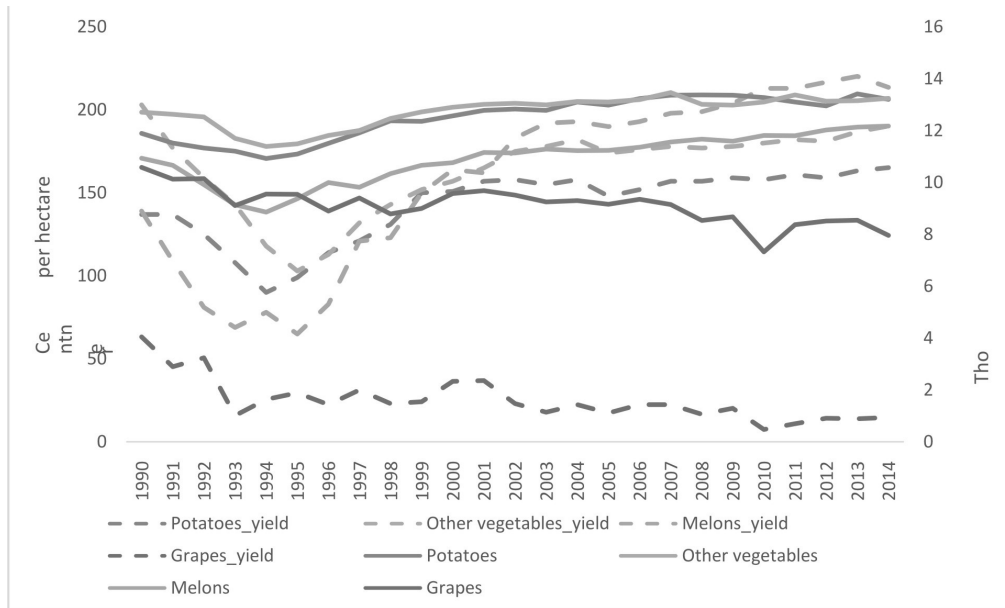


Figure 3. Production (Thousand tons) and Yields (Centner per hectare) of Fruits and Vegetables, 1990–2014

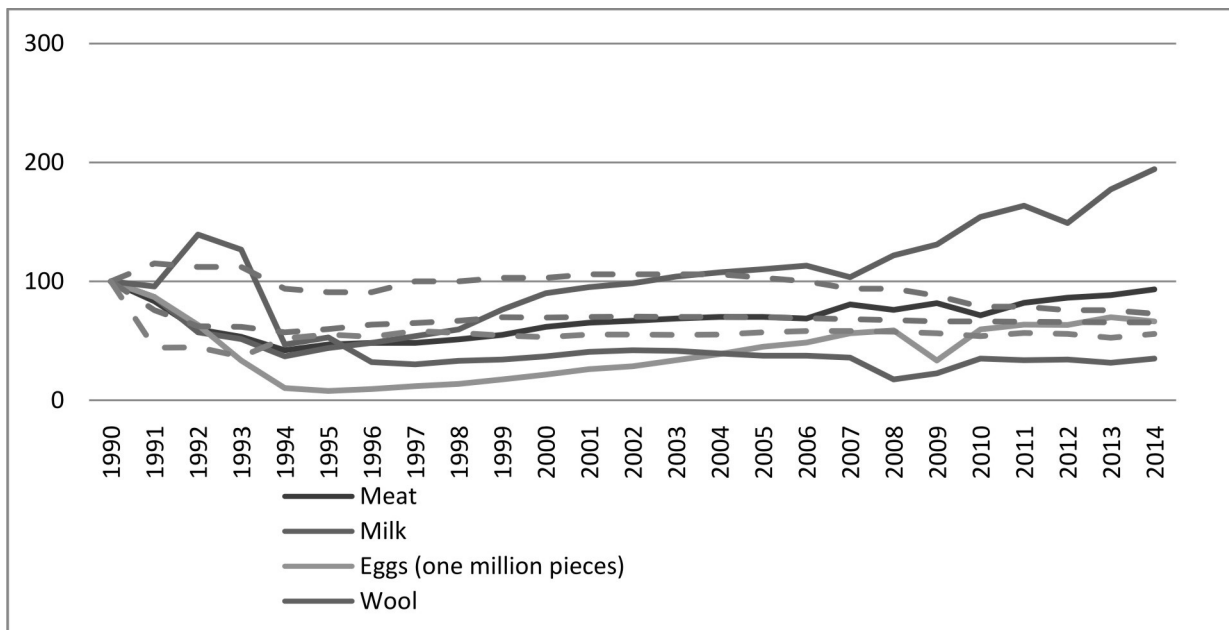


Figure 4. Production and Yields of Livestock (Year 1990 = 100), 1990–2014

lowest yields and lowest production rates in the mid-1990s and then dramatically recovered. By the beginning of the 2000s, those crops surpassed their original production rates. Yield of potatoes leveled off at 150 per hectare, and yield of other vegetables never quite reached the rates obtained before independence. Melons and grape production and yield also slowed during the transition to independent statehood. However, in the post-transition years, grapes and melon yields diverged greatly. The yield of melons dramatically increased, surpassing both potatoes and all other vegetables in productivity per hectare. Meanwhile, grape yields steadily declined.

Figure 4 details production and yield of livestock. Because livestock production was calculated in multiple units of measurement, we standardized production rates using 1990 as a base year for calculations. This standardization allows us to compare across livestock production rates and focus on the trends. For each of these production rates, we also were able to obtain information on the yield per hectare except for meat production, which is excluded from the graph.

Production of meat, milk, and eggs declined in the years of transition from Soviet rule, reaching their lowest production in 1994. Milk yield also declined during the same time, and average egg production per hen reached its lowest point in 1993. However, in the post-transition years, there was steady, gradual improvement in meat and egg production. Only during the Great Recession were there slight bumps in meat production and a slight dip in egg production. Milk production also greatly increased during the same time. This increase in total production does not, however, appear to be a result of yield improvements. Both milk and egg yields leveled off after their initial decline and did not change much in the ten years between 1995 and 2014.

Wool production appears to be an anomaly to all other livestock and crop production. While other products declined in both overall yield and total output in the early 1990s, wool yield and production increased from 1990 through 1993 but then had a sharp decline in 1994 and has remained at lower rates ever since.

### **Discussion and Conclusion**

Food insecurity faced by developing countries

is enhanced by many challenges. In this study, we examined agricultural productions in a country that experienced the collapse of the former Soviet Union—Kyrgyzstan, a mountainous country, which is the second poorest in Central Asia. Specifically, we examined agricultural productions from 1990 through 2014. The results indicated clear patterns that inflation increased dramatically in the first two to three years of independence. The economy bottomed in 1995.

Our research fills the gap in the literature on food insecurity in Kyrgyzstan, a country that is unique in many ways: it has a limited amount land appropriate for agricultural use, dramatic economic changes and reform, a high elevation that makes it relatively sensitive to climate change, an unusual pattern of outmigration, violent ethnic conflicts and changes in ethnic composition, and a population that is predominantly rural. Further, compared with the existing limited research on food insecurity in Kyrgyzstan and other Central Asian countries, we studied Kyrgyzstan from 1990–2014, a much longer time period than in the existing research, which focuses primarily on the first ten years after independence. This study provides insights into food insecurity and agriculture in Kyrgyzstan since the independence out of the former Soviet Union.

### **Acknowledgements**

This research was supported in part by the National Aeronautics and Space Administration Land Cover Land Use Change program (Award # NNX15AP81G) and the Eunice Kennedy Shriver National Institute of Child Health and Human Development (Award # R24 HD04102510). We thank Academician Prof. Dr. Asylbek Aidaraliev, Prof. Dr. Almaz Shanazarov, Dr. Murat Baihodjoev, and Dr. Sagyndyk Turusbekov for their helpful comments.

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