

Agricultural Diversification and Nutrition in Central Asia: Challenges, Opportunities, and Policy Options

Kamiljon T. Akramov
International Food Policy Research Institute
Washington DC, USA

International Conference on Agricultural Development in
Central Asia: Challenges, Opportunities, and Policy Options

Shenzhen, Peoples Republic of China
December 5-7, 2016

Introduction

- Few challenges facing the global community today match the scale of malnutrition
 - One in three people is affected by malnutrition
 - Adequate nutrition is a key factor for an active and healthy life
- SDG2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Economic consequences of malnutrition are enormous
 - Loss of 11% GDP annually in Asia and Africa
 - ROI of \$16 for every \$1 spent on preventing malnutrition

Introduction (Cont.)

- Multiple burdens of malnutrition: Calorie and protein deficiency, micronutrient deficiency, and overnutrition
- Childhood malnutrition: stunting, wasting, underweight, and overweight
- Socioeconomic consequences of stunting
 - Poor cognitive function
 - Lower productivity later in adulthood
- Progress in nutrition requires both nutrition-specific and nutrition-sensitive measures
- Agriculture is an important sector for improving nutrition

Nutrition-sensitive interventions in agriculture may help to address underlying causes of malnutrition

- Two pathways through which agriculture may promote nutrition
 - Improved agricultural income
 - Increased production of nutrient rich food (Hoddinott 2011)
- Agricultural diversity may have positive impact on nutritional outcomes (Allen et al. 2014; Fanzo et al. 2013; Dillon et al 2014)
- Positive effect of diversification into high-value crops (pulses, vegetables, and fruits) on dietary diversity and nutritional outcomes (Muller 2009, Zezza and Tasciotti 2010, Birthal et al. 2015)

Central Asian countries continue to face overlapping burdens of malnutrition

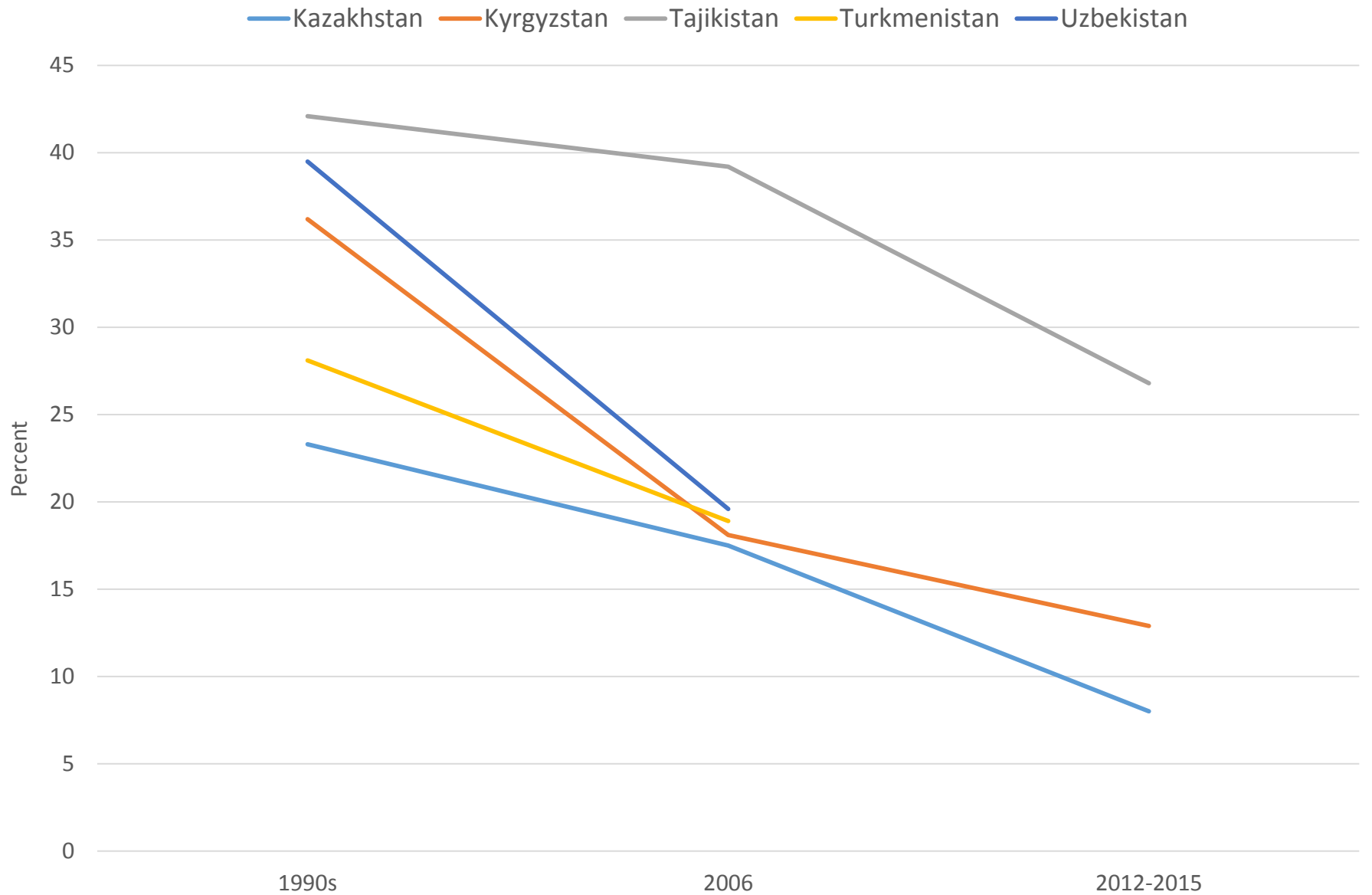
- Tajikistan
 - Child stunting and underweight, WRA, various forms of vitamin and micronutrient deficiency
- Kazakhstan, Kyrgyzstan, and Uzbekistan
 - Child underweight, adult overweight, WRA, various forms of vitamin and micronutrient deficiency

Child malnutrition remains relatively high in Central Asia

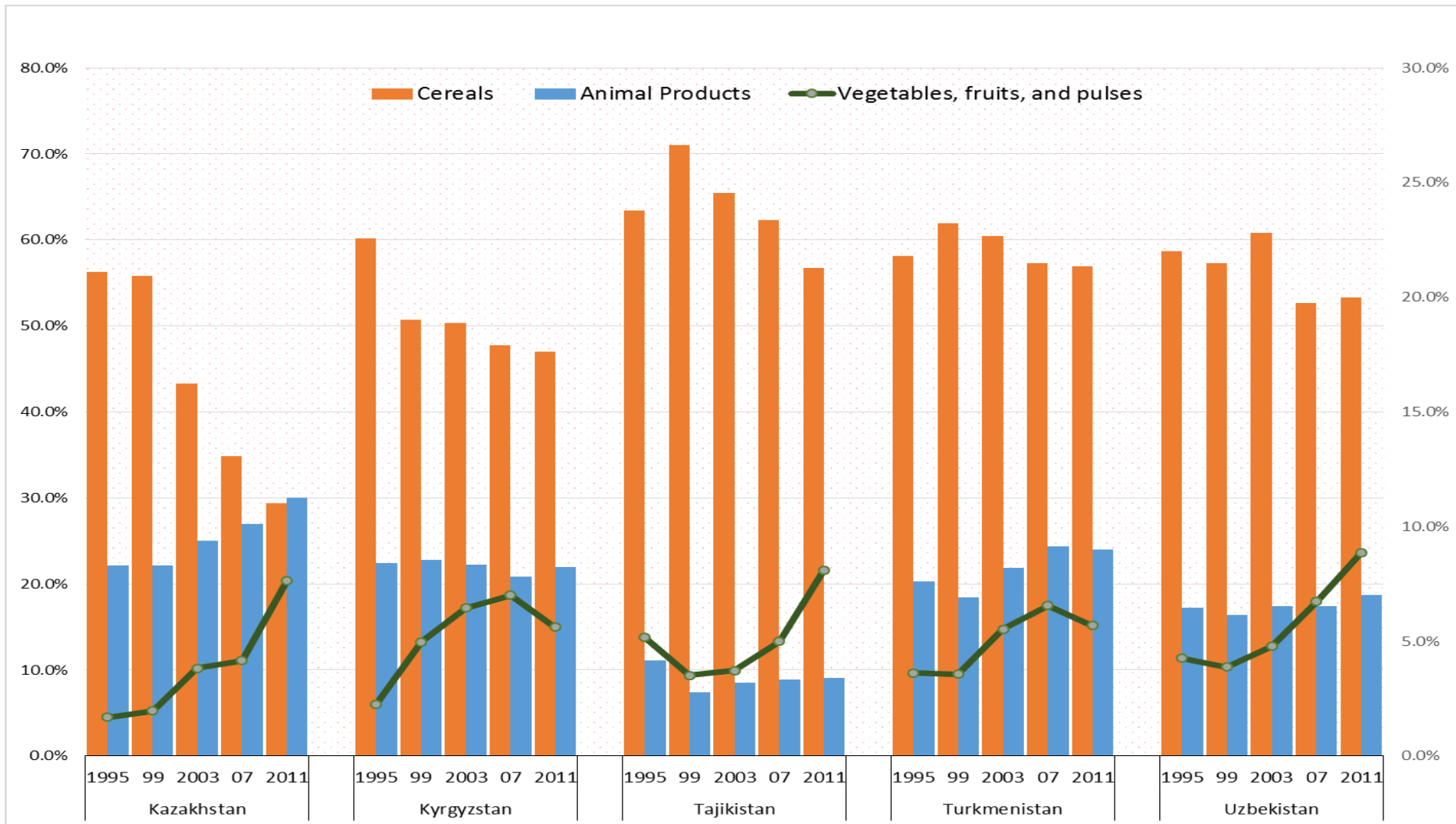
Country	Stunting	Wasting	Overweight
Afghanistan	40.9	9.5	5.4
Azerbaijan	18.0	3.2	13.0
China	9.4	2.3	6.6
Kazakhstan	8.0	3.1	9.3
Kyrgyzstan	12.9	2.8	7.0
Mongolia	10.8	1.0	10.5
Pakistan	45.0	10.5	4.8
Tajikistan	26.8	9.9	6.6
Turkmenistan	18.9	7.2	4.5
Uzbekistan	19.6	4.5	12.8

Source: UNICEF-WHO-World Bank 2016: Joint Child Malnutrition Database; Latest available data: Uzbekistan and Turkmenistan – 2006, China – 2010, and other countries 2012-2015.

Child Stunting in Central Asia is Steadily Declining

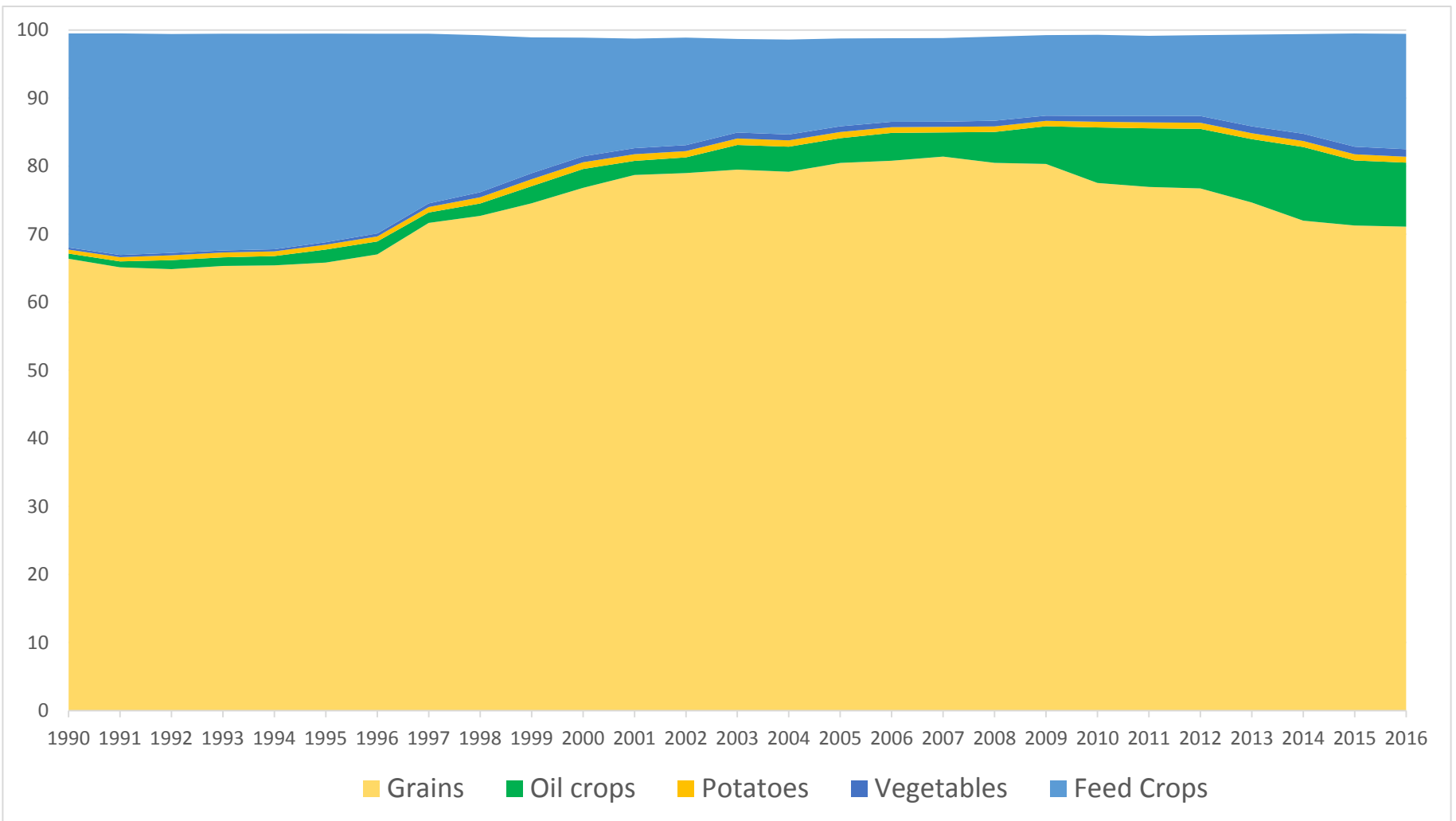


Significant shares of calorie intake come from cereals (wheat)

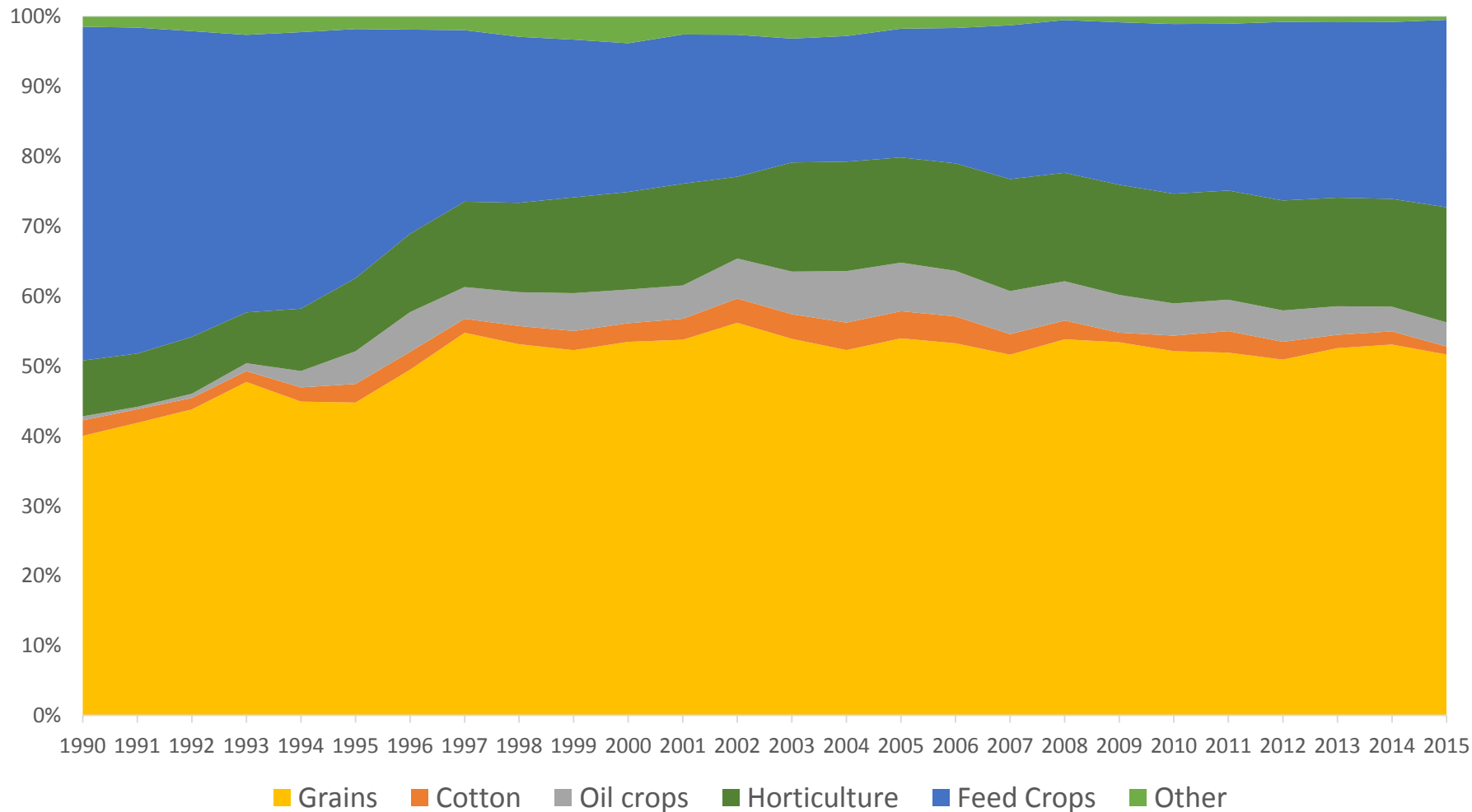


**Agricultural production
systems in the region are less
diversified**

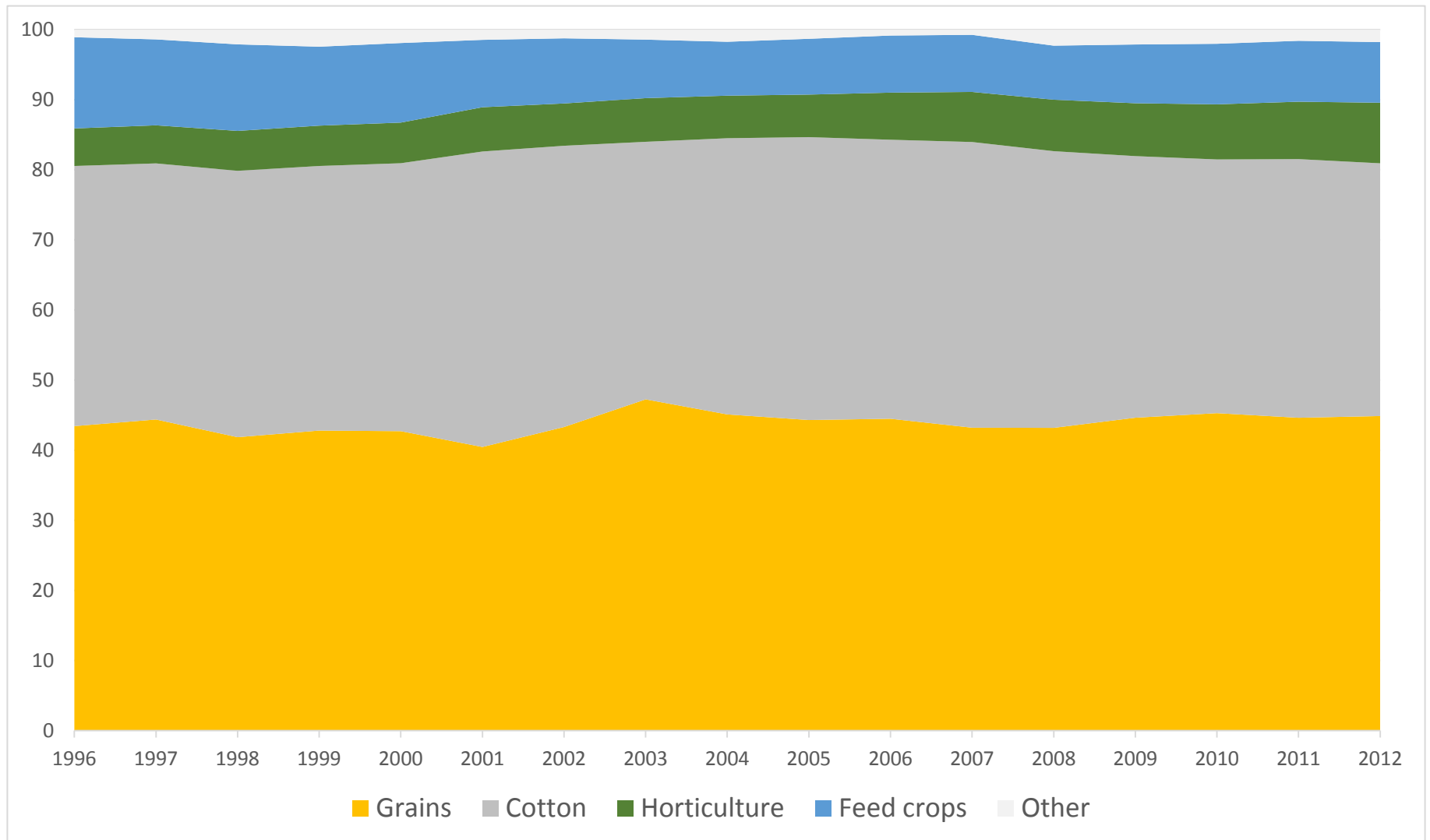
Crop diversity in Kazakhstan (1990-2016)



Crop diversity in Kyrgyzstan (1990-2015)

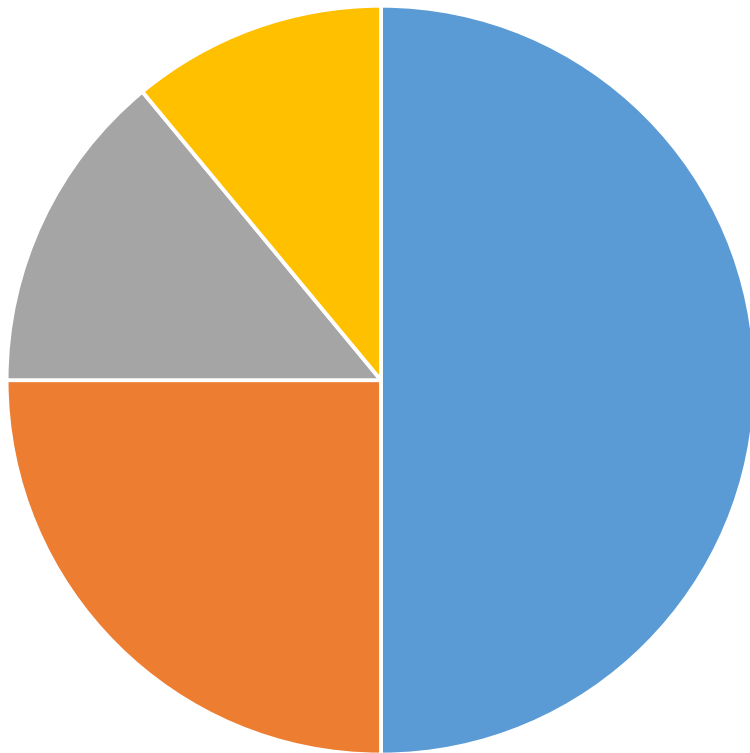


Crop diversity in Uzbekistan (1996-2012)



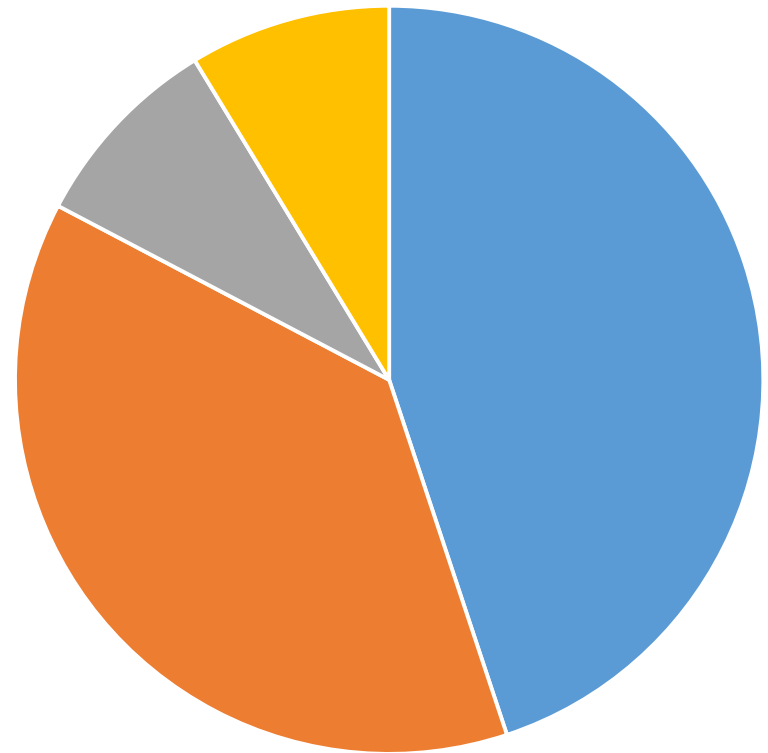
Similar cropping patterns in Tajikistan and Uzbekistan

Tajikistan (2014)



■ Grains ■ Cotton ■ Horticulture ■ Feed Crops

Uzbekistan (2012)



■ Grains ■ Cotton ■ Horticulture ■ Feed Crops

Empirical evidence on linkages between agricultural diversity and nutritional outcomes in Central Asia (Akramov and Malek, 2016)

- Two interrelated research questions
 - How is agricultural diversity linked with household dietary diversity in Tajikistan?
 - Does dominance of cotton and wheat in agricultural production system affect household dietary diversity?
- Dietary diversity is an important indicator of nutritional outcomes (WHO/FAO 2003; Arimond and Ruel 2004; etc.)
- Household dietary diversity is strongly correlated with dietary energy adequacy and nutrition indicators such as anthropometrics (Ruel 2003; Ruel et al. 2013)

Empirical methods and data

- Estimation methods
 - OLS and multilevel mixed effects regression analyses
- Data sources
 - Tajikistan Living Standards Survey (TLSS) 2007
 - Agricultural households: 3,062
 - Households with children under age 5: 2,310
 - District level population and land allocation data (Regions of Tajikistan database, National Agency on Statistics, 2011)

Measuring agricultural and dietary diversity

- Dietary diversity
 - Count based household DD score with 12 food groups was developed using FAO's (2011) guidelines
 - Calorie intake and food expenditure based indexes capture richness and evenness
 - Calorie intake and food expenditure based log-abundance indexes captures richness and abundance
- Agricultural diversity
 - Count based household level agricultural diversity score
 - Land allocation based and population-weighted agricultural diversity scores were calculated at the district level
 - Share of cotton and wheat in total sown are at the district level

Summary of key findings

- Empirical results suggest that
 - Agricultural diversity is positively associated with dietary diversity
 - There is a strong negative association between share of land allocated to cotton and wheat at district level and household dietary diversity
 - Households in communities located further away from urban centers tend to have lower dietary diversity
- These results are robust
 - Across alternative measures of household dietary diversity
 - Changes in estimation techniques
 - Controls for key child, maternal, household and community characteristics

**Promotion of agricultural diversity
by allocating more land to
horticulture and feed crops may
help to improve nutrition outcomes
in the region**

Analytical considerations

- In case of subsistence agriculture, agricultural diversity of farm household will have direct impact on dietary diversity and nutrition
- If there is a market, link between agricultural diversity and dietary diversity is not trivial
 - Farm households may aim to maximize their income by allocating land for different crops
 - Tradeoff between specialization and diversification
 - The choice made by farmers ultimately depend on subjective assessment of risk-return tradeoffs

Central Asian countries already embraced the need for agricultural diversification

- The current strategies of national governments and development partners include promotion of agricultural diversification to ensure food and nutrition security
- Kazakhstan's policy aims to decrease wheat and increase forage crops and oilseeds sown areas
- Tajikistan and Uzbekistan aim to diversify towards to horticulture crops
- What policy instruments can help to increase agricultural diversity?

Policy instruments

- Kazakhstan

- Market price support payments – about 40% of budgetary support
- Per hectare payments for priority crops – eliminated in 2016
- Per tonne payments to livestock products → higher demand for feed crops
- Concessional credit conditional with regional specialization schemes
- Input subsidies

- Kyrgyzstan

- Mainly market based instruments
- Donor support

Policy instruments (cont.)

- Tajikistan
 - Land allocation
 - Donor support
- Uzbekistan
 - Land allocation
 - Temporary tax exemption for orchards
 - Concessional loans for investment in intensive horticulture (saplings)
 - Donor support (WB, ADB, USAID, and GIZ)

Extensions

- So far, we considered agricultural diversification from the nutrition perspective
- Other perspectives may also be important
 - Wealth effect
 - Risk diversification
 - Export promotion
- If agricultural diversification implies extending production possibilities in agriculture, then that diversification by itself should lead to a wealth increase
- Diversification of production mix in agriculture may help to diminish price and production risks

Crop diversification: Wealth Effect

- World Bank (2015) analyzed relative income outcomes among wheat, cotton and representative horticultural crops in Fergana, Samarkand and Tashkent provinces of Uzbekistan
- Wheat and cotton producers receive direct support from the state, but are obligated to meet production quotas
- Farms producing horticultural goods are given greater freedom in decision-making, but are left to arrange their own credit, inputs and sales
- Study finds that revenue, operational costs and profit margins were significantly higher for horticultural crops than for wheat and cotton
- Even though new orchards generate little to no revenue early on, they are expected to produce high rates of return over a 15 year life cycle
- On per hectare basis, horticulture employs more workers than wheat or cotton

Crop diversification: Export promotion

- Diversification to high value crops such as vegetables and fruits may help to increase exports
- In Uzbekistan, the value of horticultural exports tripled between 2006 and 2010 from \$373.3 million to \$1,155 million
- In Kyrgyzstan, dry beans became an important source of export earnings; it represents the largest value agricultural product export, with \$48 million in 2012
- Exports of horticulture products from Central Asia can expand by capturing incremental shares of the Russian market
 - Russian accounts for 80% of Uzbek horticulture exports, but Uzbek imports only account 4% of all fruit and vegetable imports to Russia
- Central Asian countries should also look for new markets in Asia

Policy implications

- Promotion of agricultural diversification requires both general and sector-specific policy changes
- General policy changes
 - Alignment of macro policies, including easing of currency controls and elimination of multiple exchange rates
 - Reductions in trade restrictions and barriers for regional cooperation and integration
- Sector-specific policy changes
 - Allow farmers to make informed decisions on cropping patterns, production and marketing
 - Market-driven land consolidation to reduce fragmentation

Policy implications (cont.)

- Sector-specific policy changes (cont.)
 - Investment in irrigation and road infrastructure
 - Promoting cooperation among farmers
 - Laws on agricultural cooperation exist in most countries, however creation and operation of trade and service cooperatives still not widespread
 - Removing agriculture specific export restrictions
- Creation of reliable quality certification process, developed in partnership with private sector, but backed by government regulations, is necessary for export promotion
- Experiences of private sector led, government facilitated horticulture market channels elsewhere (Chile, Turkey) are relevant to Central Asia

Thank you!