Perspectives for individual livestock farms in post-Soviet agriculture – Evidence from Kazakhstan

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Selected Poster prepared for presentation at the Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington, DC, August 4-6, 2013.

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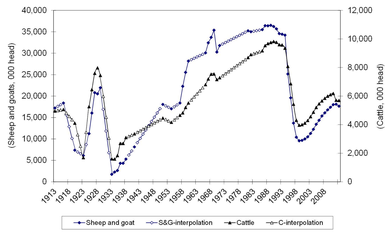
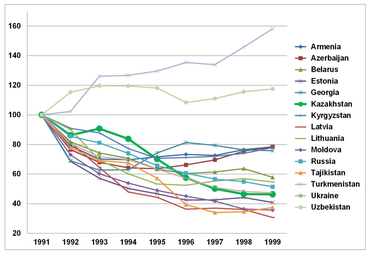
Kazakhstan's Livestock Evolution



- First dip: after the First World War and the Russian Civil War
- Second dip: collectivization under Stalin
- Third dip: livestock transfer and liquidation following the collapse of the Soviet Union

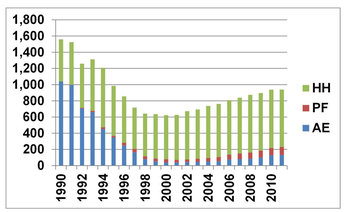
(Sources: National Statistics Agency; Olcott 1995)

Post-Soviet Transition and Recovery

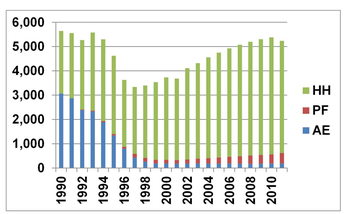


Gross Livestock Production Index
(Source: FAOSTAT)

- Kazakhstan's initial livestock decline was among the largest in the former Soviet Union.
- Grain production by large agricultural enterprises (AE) was encouraged; only recently dairy production by AE was promoted.
- Livestock recovery during the 2000s suggests initial herd liquidation was excessive.
- Livestock recovery was led by smallholder households (HH), now averaging 2.8 cattle and 12.8 sheep and goats in the study area.
- HHs could absorb much of livestock liquidated by AEs using communal rangelands (free, open-access grazing lands near villages).
- Herd size on each registered family farm or 'peasant farm' (PF) has been increasing.



Meat Production (000 tons)



Milk Production (000 tons)

(Source: National Statistics Agency)

- Milk production is almost back to the pre-transition level; meat production is not.
- Dairy value chain (especially milk collection systems) has evolved to accommodate fragmented primary production.

Policy Questions

- What are the factors leading to livestock herd expansion?
- Is the use of communal land associated with lower animal productivity?
- How can policy increase productivity and improve efficiency?
- How can HHs develop into larger, more efficient commercial units?

Objectives

- Use new farm survey data to analyze changes in livestock sector
- Estimate determinants of milk cow yield and herd expansion behavior

Data

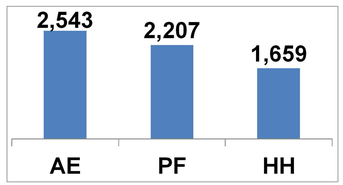
- 2012 IAMO farm survey in Almaty and Akmola Oblasts, Kazakhstan
  - AE: agricultural enterprises (n=55)
  - PF: peasant farms (n=245)
  - HH: households (n=300)

- Proportion of farms that use communal range

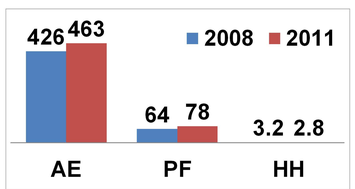
	AE	PF	HH
Almaty	40%	26%	76%
Akmola	41%	70%	82%

Only 10 producers use ranges 15+ km away from village

- Cow milk yield (kg/cow/year)



- Average # cattle per farm



- Proportion of farms that <u>increased</u> herd size between 2008 and 2011

	AE	PF	HH
Almaty	100%	72%	49%
Akmola	68%	55%	19%

Selected Regression Results

Cow milk yield function

Independent variables	(Unit)	Coeff
Almaty x communal range use	(0/1)	-547.327*
Log (hay per head)	(kg)	-20.907*
Hay/head x communal range	(kg)	0.166**
Fodder per head	(kg)	0.920*
Fodder/head x communal range	(kg)	-0.804
Concentrate per head	(kg)	0.302**
Log (all livestock in 2011)	(head)	220.413**
R^2		0.6216
N		232

∗ p<0.05; ** p<0.01

- Village dummies are included to control for climate and other location specific factors.
- Lower cow milk yield on communal land in Almaty Oblast.
- Hay has higher marginal product on communal range.
- Farms with larger herds achieve higher milk yields.

Herd expansion behavior

Dependent variable: 1 if grazing livestock increased during 2008-11

		Subsample			
Independent variables	(Unit)	PF	HH	Alm	Akm
Log (grazing livestock in 2008)	(head)	+*	-*	-*	+**
Operator age	(years)	-*	+	-	-
(Operator age)^2	(years)	+*	-	+	+
1 if use communal range	(0/1)	+	+**	+*	+*
1 if agricultural education	(0/1)	+	-**	-	-
1 if Almaty	(0/1)	+*	+**		
1 if PF	(0/1)			+**	+*
N		102	125	84	164

∗ p<0.05; ** p<0.01

(AE farms are excluded from the regressions)

- Initially larger herds tended to expand for PF and in Akmola Oblast.
- Older PF operators tended to reduce herd size.
- Communal range users tended to expand herds.
- Trained HH tended to reduce herd size.
- Higher probabilities of herd expansion for:
  - Almaty producers
  - PF producers

Conclusions

- Data indicate lower productivity and more aggressive stocking behavior on communal grazing lands.
- HH units have most of the livestock and will not disappear in near future.
- Government should focus more attention on HH and PF: e.g. funding and extension for supplementary feed, better management practices and improved milk marketing.
- Improving HH sector also addresses poverty reduction.
- Open-access regime of communal range presents real challenge.
- Some remote ranges may be deteriorating due to underutilization; otherwise they may offer opportunity for development.