

# Growth Patterns, Recent Trends and Prospects of Livestock Farming: A Case Study of East Kazakhstan Region

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### Abstract

The study highlights the trends in growth of the livestock farming in the East Kazakhstan region. The region is considered as the potential region in livestock farming in Kazakhstan because of its varied agro-ecological conditions and mountainous topography. The region has rich alpine pastures which are most suitable for grazing during summer and autumn seasons. The herders migrate seasonally with their livestock to avoid the extremes of weather. The growth of livestock for all the species is not same. The livestock of cattle, sheep & goats, camel, horse and poultry have shown positive growth during the study period; while pig numbers are decreasing in the region. The present study is an attempt to study the growth of livestock farming in the region and to suggest future trends in growth.

**Key Words:** Kazakhstan, Livestock Farming, Mixed Agriculture, Transhumant, Steppe, Growth.

## 1. Introduction

Kazakhstan is the 9<sup>th</sup> largest country of the world with an area of more than 2.7 million square kilometers. The great diversity in the agro-climatic conditions and topography of the country, from high and tall mountains and foothills in the south and southeast, to desert and semi-desert conditions in the center and extensive and fertile steppes in the north, makes this vast country a suitable place for livestock farming (Robinson. S, 2008). The Republic is rich in land resources, with over 68.8 percent of the area devoted to livestock grazing (Sedik, D, 2004).

The East Kazakhstan Region is located in the eastern most part of the Republic of Kazakhstan. The region is surrounded by Karaganda in the west, Almaty in the south and Pavlodar Region in the north west. To its south and southeast is China and in the northwest it borders Russia. Altai Mountains cover most of the territory of this region, with an average altitude of 1900-2200 metres (Mussayeva.

M, 2016). The zone receives maximum precipitation in Kazakhstan, averaging between 500-1600 millimetres and is known for its rich alpine pastures, which serve as perfect grazing sites during summer and autumn. Livestock farming and mixed agriculture are widely practiced. The dominant livestock species are sheep and cattle. Horticulture and grain cultivation is widespread. Due to diversity in climatic and ecological conditions the pastoralists practice transhumance which leads to long distances seasonal migrations separating winter and summer grazing sites (Kerven. C, 2003).

**Table.1: Major characteristics of the East Kazakhstan Region**

Capital	Oskemen
Area	283226 sq.km
Population	1396593
Population Density	4.9/km <sup>2</sup>
Rural population	42.6
Urban Population	57.4
Districts	15
Cities	10
Towns	30
Villages	870
Average Altitude	1900-2200
Average Temperature	From -17 to -26°C in January to 19-23°C in July.
Total Livestock (000' Numbers)	68431

Source: Committee on Statistics of the Republic of Kazakhstan

## 2. Materials and Methods

The present study was carried out in the East Kazakhstan Region. Livestock production of the region was assessed on the basis of secondary data. The data on livestock for a period of 15 years from 2003-2017 was obtained from the Committee on Statistics of the Republic of Kazakhstan, Statistical

Yearbooks published by the Ministry of National Economy of the Republic of Kazakhstan, various publications of the Ministry of National Economy including *Kazakhstan Today* and *Kazakhstan in Figures*, and Food and Agricultural Organisation. The collected data was analysed and interpreted through tabulation and simple percentage methods. Growth rate of the livestock production was computed for a period of 15 years from 2003 to 2017. To study the recent trends and future prospects in growth of livestock production, Regression Model was used, which is given as follows:

$$y^t = a + bx \dots \dots \dots eq. (i)$$

Where,  $y^t$  = Dependent variable for which the trends are estimated over time i.e., Livestock Production,

X is explanatory variable,  
 B = Regression coefficient, and  
 A = Intercept Subjected to the given normal equation,

$$\sum y = Na + b\sum x \dots \dots \dots eq. (ii)$$

$$\sum xy = a\sum x + b\sum x^2 \dots \dots \dots eq. (iii)$$

Annual percentage growth rate was calculated over the study period by employing the following formula:

$$GPR = \frac{V \text{ Present} - V \text{ Past}}{V \text{ Present}} \times 100 \dots \dots \dots eq. (iv)$$

Where, GRP = Growth Rate in Percent  
 V present = Present or Future Value  
 V past = Past or Present Value

### 3. Results and Discussion

Agriculture and livestock holds a key position in the economy of the Kazakhstan and is an important source of food and employment in the rural areas (Flake. L, 2011). Around 20 % of the country's population depend on this sector for their livelihood. The East Kazakhstan region has varying agro-ecological conditions which provides an impetus for a wide range of cropping pattern and livestock. Sheep and cattle are the main livestock species. Apart from sheep and cattle other animals like pig, horse, camel and poultry are equally important. Meat, wool and other livestock products are important for the rural economy of the region. The total livestock population of the East Kazakhstan region in 2017 was 6769 thousand, consisting of 845 thousand cattle, 1928 thousand sheep & goats, 309 thousand horses, 63 thousand pigs and 3778 thousand poultry. Of the total livestock production in Kazakhstan, the East Region has 12.62 % of cattle, 9.07 % of sheep & goats, 8.2 % of pigs, 13.3% of horse and 9.70 % of poultry. The region produces 11.6 % of wool, 16.2 % of meat and 15.9 % of total milk production in East Kazakhstan. Livestock population of all species and their annual growth rate is shown in the table 2.

**Table. 2: Livestock and Annual Growth by type of Species 2003-2017 (000' Numbers)**

Year	Cattle		Sheep and Goats		Pigs		Horses		Camels		Poultry		Total	
	Numbers	Annual Growth(%)	Numbers	Growth (%)	Numbers	Annual Growth(%)	Numbers	Annual Growth(%)	Numbers	Annual Growth(%)	Numbers	Growth (%)	Numbers	Annual Growth(%)
2003	662	--	1415	--	153	--	128	--	0.3	--	2714	--	5072.3	--
2004	706	6.2	1588	10.8	106	-44.3	140	8.5	0.4	25	2831	4.1	5371.4	5.5
2005	735	3.9	1763	9.9	104	-1.9	149	6.0	0.4	0	2877	1.5	5628.4	4.5
2006	755	2.6	1938	9.0	118	11.8	164	9.1	0.4	0	3011	4.4	5986.4	5.9
2007	764	1.1	2055	5.6	114	-3.5	172	4.6	0.4	0	3355	10.2	6460.4	7.3
2008	768	0.1	2173	5.4	91	-25.2	184	6.5	0.5	20	3231	-3.8	6444.5	-0.2
2009	783	2.2	2279	4.6	87	-4.5	197	6.5	0.5	0	3198	-1.0	6544.5	1.5
2010	757	-3.4	2289	0.4	96	9.3	203	2.9	0.5	0	3040	-5.1	6385.5	-2.4
2011	733	-3.2	2194	-4.3	98	2.0	207	1.9	0.5	0	2681	-13	5913.5	-7.9
2012	740	0.9	2196	0.09	93	-5.3	216	4.1	0.5	0	2954	9.2	6199.5	4.6
2013	769	3.7	2207	0.4	85	-9.4	234	7.6	0.6	16.6	3277	9.8	6572.6	5.6
2014	802	4.1	2161	-2.1	66	-28.7	259	9.6	0.6	0	3373	2.8	6661.6	1.3
2015	839	4.4	2015	-7.2	65	-1.5	285	9.1	0.5	-20	3768	10.4	6972.5	4.4
2016	868	3.3	1928	-4.5	63	-3.1	309	7.7	0.5	0	3778	0.26	6946.5	-0.2
2017	845	-2.7	1663	-16	67	5.9	322	4.0	0.6	16.6	3872	2.4	6769.6	-2.6

Source: Committee on Statistics of the Republic of Kazakhstan

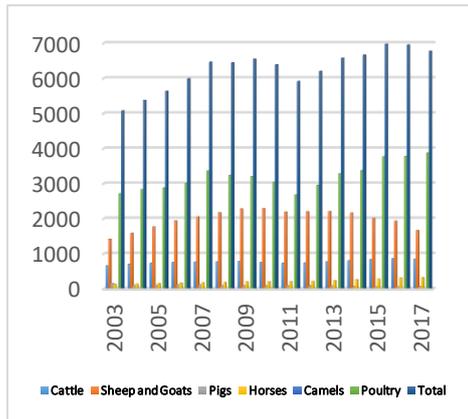


Figure 1: Livestock Numbers

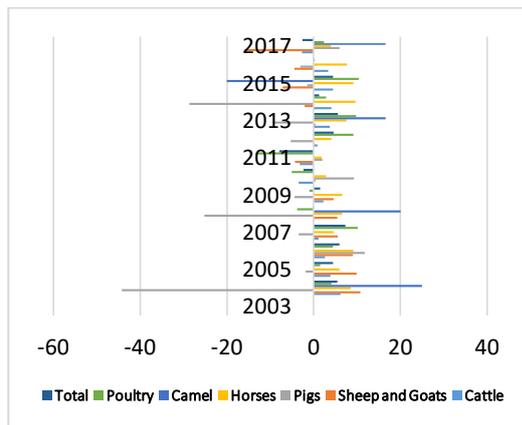


Figure 2: Annual Growth Rate

The estimates of parameters 'a' and 'b' for each type of livestock species were obtained by using formulas  $\sum y = Na + b\sum x$  and  $\sum xy = a\sum x + b\sum x^2$  and the values are,

Table: 3

Livestock (000')	'a'	'b'
Cattle	768.4	10.2
Sheep and Goats	1990.9	22.6
Pigs	93.7	-4.7
Horses	211.2	13.1
Camels	0.48	0.01
Poultry	3197	65.6

The estimated parameters of 'a' and 'b' now will be applied into the formula,  $y^t = a + bx$ , in Table 4, to show the trend for the livestock. The trend results show the growth in livestock of all the species in the East Kazakhstan region and the future prediction of the growth by 2030 has also been obtained.

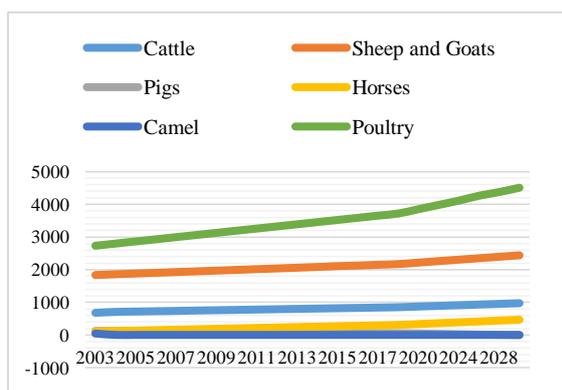
Table 4: Trend of livestock by type of species

Type (000')	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cattle	679	707	717	727	737	748	758	768	778	788	799	809	819	829	839
Sheep & Goats	1832	1855	1877	1900	1923	1945	1968	1990	2013	2036	2058	2081	2103	2126	2149
Pigs	126	121	117	112	107	103	98	93	89	84	79	74	70	65	60
Horses	119	132	145	158	171	185	198	211	224	237	250	263	276	289	302
Camels	0.41	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.50	0.51	0.52	0.53	0.54	0.55
Poultry	2737	2803	2869	2934	3000	3065	3131	3197	3262	3328	3393	3459	3525	3590	3656

Table. 5: Projected Growth in livestock by type of species 2018-2030.

Type (000')	2018	2020	2022	2024	2026	2028	2030
Cattle	850	870	890	911	931	952	972
Sheep & Goats	2171	2216	2262	2307	2352	2397	2442
Pigs	56	46	37	27	18	9	-0.3
Horses	316	342	368	394	420	447	473
Camels	0.56	0.58	0.60	0.62	0.64	0.66	0.68
Poultry	3721	3853	3984	4115	4264	4377	4509

Based on figures in Table 4 and the projected growth in Table 5, following growth trend has been constructed by type of species in Figure 3.



**Figure 3: Trends in growth from 2003-2017 and Projected growth by 2030.**

The growth of livestock in East Kazakhstan region between 2003-2017 has not been same for all the species. (Ferret. C, 2012) The livestock of cattle, sheep & goats, horses, camels and poultry have registered a positive growth of 21.6 %, 14.9 %, 60.2 %, 50 % and 29.9 %, however, during the same period the livestock of pigs has registered a negative growth of 128.3 %. The negative growth in pigs is due to religious factors. The region has dominance of the Muslim population, who encourage the spread of *halal* products, as they do not consume pork. The Christian population who rear pigs has decreased after independence and has remained confined now only to northern parts of the Kazakhstan, (Robinson. S, 2008).

#### 4. Conclusions and Suggestions

The projected growth in livestock indicates an increase of 12.5% in cattle, 11% in sheep & goats, 33.1% in horses, 17.6% in camels and 17.4% in poultry between 2017 to 2030. The expected figures for 2030 are, 972 thousands of cattle, 2772 thousands of sheep and goats, 473 thousands of horses, 0.68 thousands of camels and 4509 thousands of poultry. The result achieved has a practical importance in formulation of policies for planning purposes. The project growth for the livestock species have been shown for 2030, possibly with the assumption that if all other variables like economic growth, climatic condition, absence of epidemics and diseases, agricultural development and other factors remain constant then it could be possible to achieve the same figures by 2030. The livestock of the East Kazakhstan Region has bright prospects to turn into an alternative livelihood for the poor and rural people, given there is sustainable resource utilization and management of the grasslands.

#### References

- [1] Baba. S. H. et al., Dynamics and Sustainability of Livestock Sector in Jammu & Kashmir, *Agricultural Economics Research Review Vol. 24*, January-June 2011 pp 119-132.
- [2] Robinson. S. (Ph.D. Thesis), *Pastoralism and Land Degradation in Kazakhstan*, ICCS Interdisciplinary Centre for Conservation Science, University of Oxford. 2008.
- [3] Kerven. C, "Livestock Mobility and pasture Degradation in Kazakhstan's Semi-Arid Rangelands", in Kerven. C. (edited), *Prospects for pastoralism in Kazakhstan and Turkmenistan*. Routledge Curzon, 2003. pp. 27
- [4] World Bank., *Kazakhstan's Livestock Sector Supporting its Revival*, Country Report, Washington DC, USA, June 2004.
- [5] Mussayeva. M, Rudert. D, *Kazakhstan Country Profile - Agricultural sector 2015-2016*. German-Kazakh Agricultural Policy Dialogue. 2016.
- [6] Ferret. C., *Mobile pastoralism a century apart: continuity and change in south-eastern Kazakhstan, 1910 and 2012*. *Central Asian Survey*, ISSN: 0263-4937 (Print) 1465-3354.
- [7] Roy H. Behnke, "Reconfiguring Property Rights and Land Use" in Carol. Kerven. (edited), *Prospects for pastoralism in Kazakhstan and Turkmenistan*. Routledge Curzon, 2003.
- [8] Flake. L., *Kazakhstan's Cattle sector beginning to expand*, USDA Foreign Service, 2011.
- [9] Battuvshin. Etal., *Application of the Logistic Growth Model: Estimation of Livestock Population in Mongolia*, *Modern Management Science & Engineering* ISSN 2052-2576 Vol. 3, No. 1, 2015.
- [10] World Bank., *Kazakhstan's Livestock Sector Supporting its Revival*, Country Report, Washington DC, USA, June 2004. pp. 89.
- [11] Sedik, D. "Introduction to Social and Economic Effects of Land Reform in Kazakhstan, Azerbaijan, Moldova, and Bulgaria." Unpublished. 2004.
- [12] Statistical Committee of the CIS. 2001. *Ten Years of the Commonwealth of Independent States, 1991-2000*. Moscow.