

Livestock insurance for food security under climate change: a study from Uzbekistan

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Abstract. The article delves into the critical intersection of climate change, food security, and the insurance landscape for cattle farming, highlighting the urgency of addressing these interconnected issues. With the direct impacts of global climate change increasingly affecting food production and livestock health, the need for comprehensive insurance coverage in agriculture, particularly in livestock farming, has never been more apparent. Despite the presence of 38 insurance companies in the country, only "Uzagrosugurta" JSC offers agricultural insurance, and even then, it does not provide full coverage. In response to this gap, the article proposes and recommends measures for enhancing insurance coverage, particularly against certain types of diseases that pose significant risks to livestock. These measures are part of a broader strategy to promote voluntary insurance of livestock against all potential risks, ensuring the sustainability and resilience of cattle farming in the face of climate change. By emphasizing the importance of insurance in mitigating the impacts of climate change on agriculture, the article underscores the need for proactive and innovative solutions to protect livestock farmers and ensure food security. It calls for collaboration between insurance companies, policymakers, and agricultural stakeholders to develop tailored insurance products that address the specific challenges faced by cattle farmers. Ultimately, the article advocates for a holistic approach to livestock insurance that considers the broader context of climate change and its implications for food production and security.

1. Introduction

Among the various political and economic problems threatening the world community, the appearance of environmental problems related to climate change on the international stage is of equal concern to everyone [1]. In this respect, today, finding a solution to these problems has become one of the main topics of world researchers [2, 3].

At a time when global climate changes are occurring, risks such as the occurrence and recurrence of various natural events on a global scale are affecting the economic growth of the countries of the world, and such losses are directly related to food security [4]. As a result of climate change, in particular, global warming, melting of glaciers, rising ocean and sea water levels, atmospheric air pollution in industrialized cities, catastrophic events such as tsunamis and earthquakes, volcanic eruptions are observed in many countries. This is the cause of economic losses and increase in financial expenses of various countries, and increase in foreign debts [5].

The risk of climate change is increasing year by year, the emergence of problems related to food safety as a result of various accidents, man-made and unexpected natural disasters, and finding a scientific and practical solution to this is one of the urgent issues [6].

In the perspective of the priority development of the dairy industry in the agricultural sector of Uzbekistan, it is one of the most important sectors in ensuring the food security of the population of Uzbekistan, in supplying the population with cheap and high-quality meat and dairy products, and in supplying the leather and footwear industry with raw materials. is one. Taking into account the fact that almost 17.4 million people of Uzbekistan live in rural areas, it is worth saying that by engaging in various forms of cattle farming, it is important to ensure the employment of the population and to a certain extent to increase the source of income [7].

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In Uzbekistan, farmers and peasant farms engaged in cattle farming, as well as households, are responsible for livestock feeding, feeding, planting and growing fodder crops, storing fodder, feeding with fodder based on rations, artificial insemination and breeding. - aimed at maintaining book documents [8]. Livestock breed, origin, exterior and constitution, productivity, breeding work, product identification, certification, feed preparation technologies, theoretical and practical foundations of industry development are analyzed [9].

In Uzbekistan, research was carried out on the insurance of agricultural risks. economic activity is always at risk. Usually, rural entrepreneurs avoid making decisions in risky situations, except in cases where high profits can be obtained [10, 11]. In fact, the researcher studied the risks based on the basis of categories, but today, the lack of use of digital technologies in agricultural insurance leads to an increase in financial costs related to insurance activities [12].

Cattle farming insurance in terms of ensuring the resilience of cattle farmers to climate change in households, in particular cattle farming insurance, insurance protection from various natural events occurring during the production of cattle farming products.

2. Materials and Methods

Ensuring food safety has become a pressing global concern, particularly in the face of climate change and its impact on agricultural practices, including farming and cattle farming. Climate change has led to a range of natural and man-made phenomena that adversely affect agricultural development. The increase in air temperature, drought, hail, strong winds, severe and dry frost, and a sharp decrease in precipitation have all contributed to challenging conditions for farming. Additionally, various fires, increased pressure from pests and insects, reduction of pastures, and soil erosion further exacerbate these challenges. These factors collectively impact the availability and quality of livestock fodder, leading to various diseases in cattle farming and hindering the industry's development.

The year-by-year increase in climate change exacerbates these challenges, negatively affecting the activities of cattle farming industries worldwide. The prevention of these impacts and the provision of financial support to agricultural enterprises in the context of climate change have become urgent priorities.

To address these challenges, there is a need for comprehensive strategies that focus on climate-resilient agricultural practices. This includes the development of drought-resistant crops, efficient water management techniques, and the implementation of sustainable farming practices. Furthermore, enhancing livestock management practices, such as improved breeding and feeding techniques, can help mitigate the impact of climate change on cattle farming.

Additionally, financial support mechanisms, such as agricultural insurance, can play a crucial role in providing farmers with the necessary financial security to cope with climate-related challenges. Governments, international organizations, and stakeholders must work together to develop and implement policies and initiatives that promote sustainable agriculture and support farmers in adapting to climate change.

3. Results and Discussion

The role of farmers and peasant farms in providing the population and processing industries with cattle farming products is of special importance. If we look at the example of farms specializing in cattle farming that supply cattle farming products to Uzbekistan, the number of large horned cattle in all categories of farms in 2011 was 9,642.7 thousand, of which 5.3 percent or 507,2 thousand heads belong to livestock farms. During this period, the share of livestock owned by households was 94.7 percent. During this period, the number of farms specializing in cattle farming was 6487.

As of 2021, the number of large horned cattle in all categories of farms is 13,555,800, which has increased by 3,913,100 compared to 2011. By 2021, the number of farms specializing in cattle farming (cattle farming, sheep and goats, camels and goats) will be 13,519.

It can be seen that the number of large horned cattle in farms operating in the agrarian sector increased by 1.7 times or 378,100 heads in 2021 compared to 2011. However, it can be concluded from the data that almost 90-95 percent of the livestock, mostly large-horned cattle, are grown in peasant farms (private assistants) and it is evidence of their high importance in ensuring the food security of the population.

Attention to the development of cattle farming industries is increasing year by year, in this regard, according to the specialization of cattle farming farms in 2021, there are 7614 cattle farms, i.e. raising large-horned cattle, 3263 small-horned sheep. There are cattle and goat farms, 142 cattle farms, 52 camel farms, 1163 poultry farms, 429 fish farms, 715 bee farms, and 254 rabbit farms. Currently, the number of farms with livestock from 500 to 1000 heads is 256, and the number of farms with 1000 livestock and above is 136.

In order to develop the cattle farming industry, the cows and carcasses that are cared for in households and farms are artificially inseminated, and due to the improvement of the breed of cattle, their number is increasing. Also, according to the decision, Aberdeen-Angus, Charolais, Hereford and Limousin breeds of cattle bred for meat were brought to Uzbekistan from foreign countries. Also, as a result of bringing new breeds such as Jersey, Swiss and

Montbillard in the milk direction, the cattle farming industry is enriched with new breed breeds. Livestock of this breed is maintained in the Republic of Karakalpakstan, Jizzakh, Navoi, Syrdarya, Tashkent, Khorezm regions. Today, 497 farms have been transferred to the breeding category for improvement of livestock breeding, and their number is 1,640.

In the course of domestic and imported livestock care, the death of livestock due to the effects of various diseases and natural disasters has a significant impact on the development of the industry. In 2010-2021, if we look analytically at the state of death of livestock from various diseases and other natural disasters in the Republic of Uzbekistan, mainly large-horned cattle, the number of deaths from digestive diseases of livestock in 2010 was 1158, the number of deaths from respiratory diseases was 1153, the number of deaths from metabolic disorders was 104, and the number of deaths from various injuries and other natural disasters was 143. By 2021, it can be seen that the death rate has decreased compared to previous periods.

The trend of decreasing insurance contracts for livestock farming over the years, as observed from 2010 to 2021, highlights several significant shifts in the industry. The peak in insurance contracts during 2010-2011 indicates a period of heightened awareness and possibly increased risk perception among livestock farmers, leading to a higher demand for insurance coverage. However, the subsequent decline in insurance contracts from 2012 onwards suggests a change in the dynamics of the industry.

Several factors could contribute to this decline. One possible reason is the improvement in farming practices and infrastructure, leading to a reduced perceived risk of losses due to natural disasters or other unforeseen events. Additionally, changes in government policies related to agriculture and insurance may have influenced farmers' decisions regarding insurance coverage. Economic factors, such as fluctuations in livestock prices and input costs, could also play a role in farmers' decisions to invest in insurance.

It is essential to analyze the reasons behind this sharp decrease in insurance contracts to understand the current challenges facing the livestock farming industry. By identifying these challenges, stakeholders can develop targeted strategies to support farmers and ensure the sustainability of the sector. This may include revisiting insurance policies and products to better meet the needs of farmers, providing incentives for insurance uptake, and promoting risk management practices that reduce the vulnerability of livestock farmers to potential risks (Figure 1).

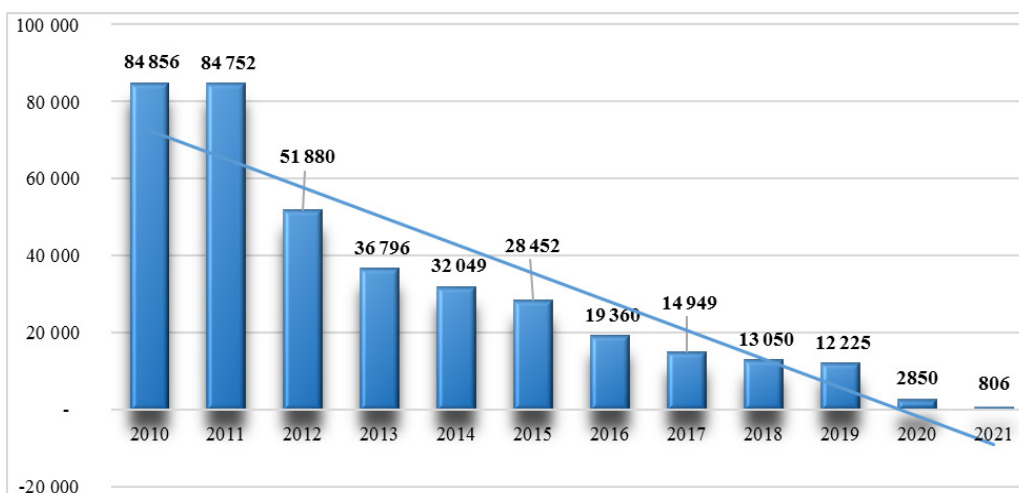


Fig. 1. Changes in livestock insurance contracts in Uzbekistan over the years (2010-2021)

Insurance contracts concluded with agricultural enterprises for the purpose of insuring livestock are an important legal document, but the entry into force of each concluded insurance contract directly depends on the income of the insurance premium paid on time by the insured client. Therefore, the payment of the insurance premium means that the insurance contract has entered into force.

The dynamics of insurance premium income for livestock insurance in agricultural enterprises across Uzbekistan from 2010 to 2021 reveal interesting trends and fluctuations. The data presented in Figure 2 indicates that there has been a significant fluctuation in insurance premium income over the years, with both peaks and troughs observed.

The year 2017 stands out as the year with the highest recorded insurance premium income, reaching 497,000,000 UZS. This could be attributed to various factors, such as an increase in awareness about the importance of livestock insurance, improved insurance products, or specific conditions in that year that led to higher demand for insurance coverage.

On the other hand, 2014 saw the lowest recorded insurance premium income at 13,419,200 UZS. This could be due to a variety of reasons, including a decrease in livestock numbers, lower perceived risks by farmers, or economic conditions affecting farmers' ability to invest in insurance.

The overall trend, however, shows a decrease in insurance premium income in 2021 compared to 2010, by almost 1.6 times. This decline could reflect changing dynamics in the agricultural sector, including shifts in livestock farming practices, changes in government policies related to insurance, or broader economic factors impacting farmers' decisions.

Understanding the dynamics of insurance premium income is crucial for policymakers, insurers, and farmers alike. It helps identify trends, challenges, and opportunities in livestock insurance, allowing stakeholders to develop targeted strategies to support the sector and ensure its sustainability.

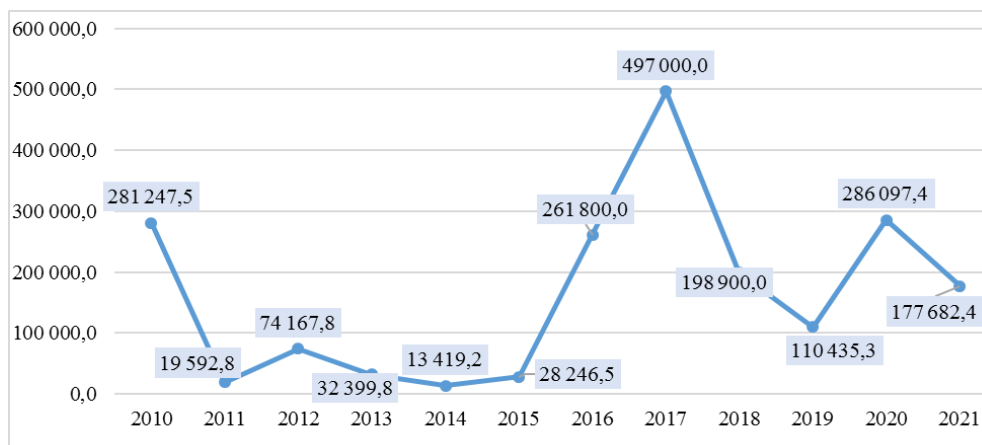


Fig. 2. Amount of insurance premium income from livestock insurance in farmers and peasant farms in Uzbekistan, ‘000 UZS

If we look at the state of livestock insurance in the regions of the Republic of Uzbekistan as of 2021, the income of insurance premiums in the republic totaled 177.7 million UZS. the amount of insurance indemnities paid in order to cover the damage caused by the accident was 21.1 million UZS. It is worth saying that by 2021 it will decrease by 319.3 million UZS compared to 2017. This indicates that measures for livestock insurance were not carried out on time, financial difficulties in paying insurance premiums and decreased interest in livestock insurance (Table 1).

Table 1. Analysis of coverage level of livestock insurance in 2017-2021

Years	Number of insurance contracts concluded on livestock insurance	Number of farms specializing in cattle farming	Number of heads of large horned cattle available on farms	Coverage rate, % in relation to the number of livestock
2017	14949	11511	615900	2.4
2018	13050	12035	662200	2.0
2019	1225	11713	708300	0.2
2020	2850	13049	784500	0.4
2021	806	13519	885300	0.1
Difference between 2021 and 2017 (+;-)	-14143	2008	269400	-2.3

If we pay attention to the level of coverage of livestock insurance in the farms specializing in cattle farming in the agricultural sector of Uzbekistan, in 2017, the level of coverage in relation to the number of livestock belonging to farms was 2.4 percent. By 2021, the number of insurance contracts has decreased to 14,143, and the level of coverage in relation to the number of livestock belonging to farms is 0.1 percent. As can be seen from Table 1, it shows the rate of livestock insurance falling from year to year.

The lack of a fully formed single database for livestock identification poses challenges in effectively managing and tracking animals. This can lead to difficulties in implementing disease control measures, ensuring food safety, and providing accurate data for policy-making and agricultural planning. It is important for authorities to prioritize the development of a comprehensive database for livestock identification to improve overall management practices and enhance the efficiency and effectiveness of the livestock sector. This would require collaboration between relevant

stakeholders, including government agencies, farmers, and technology providers, to establish a unified and reliable system for livestock identification and data management.

4. Conclusions

As a result of climate change, factors affecting the productivity of agricultural farms are increasing, causing a decrease in the yield of agricultural products or a decrease in the possibility of obtaining the expected harvest. At the same time, the impact of various pests and insects on crop yields is increasing under the influence of weather changes related to climate change. Large-horned cattle are distinguished by a higher number of deaths from respiratory diseases and diseases of the digestive organs compared to other diseases. It is appropriate to pay more attention to the insurance protection of large horned cattle against these diseases.

Also, in terms of preventing food safety, one of the important issues facing us is to increase the livestock in Uzbekistan, bring in breeding livestock, and adapt their insurance protection system to the requirements of the time.

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