On the problems of adaptation of the livestock husbandry to the climate changes

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Abstract

Researchers and scientists of many countries agree that more than 60 percent of all the natural disasters are related to the climate changes.

During the recent years, because of global climate changes and warming a number of rivers, springs, lakes and ponds have been dried out, the level of underground water has been fallen down, mechanical wells have been drained, the pasture water supply and source has been diminished in Mongolia.

Until 1990s there were registered more than 40.000 wells in Mongolia, over 20.00 of which were built with engineering constructions, and the rest were hand-dug. By this time almost 60% of the pasturelands were provided by water sources. According to the information data collected by more than 40 weather observation points, located in the different regions and climate zones of the country the weight of local Mongolian cattle was declined by 14-16 kilos, sheep and goats by 7-8 kilos, and weight of wool of sheep approximately by 90 grams during the last 40 years. This data is worth to take serious attention on the issue. Particularly, the length of summer and autumn is shortened up to 100-120 days, while the days of winter and spring prolonged up to 220-240 days in Mongolia.

Introduction

It is commendable that human beings are now developing and implementing definite policy on complex ecological, economic and social issues at world, regional and national levels, having realized even later about improper actions affecting adversely existence of our mother earth, although human beings are product of Mother Nature. In such time of worldwide agreement with that there is no any other way to work as mentioned above, our country are also active by joining UN fundamemntal convention of climatic change in 1993, and Kyoto Protocol in 1999, developing program tended to fulfil responsibilities as described in above documents, and making some progresses. However, it is clear that there are different circumstances if initiatives and activities of our social, economic and ecological sectors for adaptation to global climatic change are evaluated. Generally, many actual questions such as what ere necessities and demands for adaptation to climatic changes and which are mechanisms and variants of measures to be taken are now awaiting relevant solutions.

Improvement of adaptability of pastoral animal husbandry to climatic change has been paramount, because moisture loss from land surface is greater by several times than precipitation in association with very natural and ecological systems, more than 60%

permafrost soil of our total territory land, and 3 fold intensive warming in our country as compared to other countries worldwide.

Scientists of many other countries have been in agreement with that more than 60% of natural disasters occurred worldwide are associated with climatic change.

In this year Davos forum, the presentation “Risk of globalization”, prepared by more than 500 worldwide top politicians, economists and scientists concluded climatic change is seen to be the most risky one among 40 factors affecting adversely future development of our earth, and listed at first.

All nations agreed this is a conclusion evidencing repeatedly that essential demands to develop and implement policies tended to create ability to minimize the intensity of climatic change and adapt to such change for all socio-economic sectors of every nations are being rising.

A policy objective “To ensure sustainable development via creation of methods and capacity to adapt climatic change, and termination of and protection from loss of ecosystem equilibrium” in National complex policy based on objectives of Millenium development, adopted by State Ikh Hural of Mongolia has been propounded.

To accomplish this objective, intitiative and active participations of state, aimag’s and local authorities responsible for social, economic, nature and environmental issues on the one side and citizens and enterprises on the other side have been essentially important.

Issues of improving adaptation of our country’s animal husbandry to climatic change should have broad spectrum and complex nature, covering social, economic, ecological and biological sides. However, it is impossible to write all those in a paper and therefore this time few suggestions on how climatic change exert adverse impacts on our animal husbandry sector and is there any possibility to minimize exposures are contributed.

Results

Livestock population, a living factory with complicated biological technology, which amounted to more than 30 million in 2010, produces approximately 86% of agricultural products, supplies human populations with ecologically clean food products and small,

medium scale enterprises with raw materials, and becomes guarantee of livelihoods of many families and individuals, and everybody believes such will be in the future.

Pastoral animal husbandry practices in Mongolia can be realized as follows:

From the scheme, consequences of droughts and zuds occurred in the last years demonstrate clearly that our pastoral animal husbandry relies on readily available resources of natural plants, water and minerals, depends directly from behaviors of father sky and mother earth all year round, and can not be considered as a sector providing reliable livelihood source and guaranteed jobs.

Global climatic changes and warming are more intensively detected in our country, exert adevrs effects on animal husbandry practices and cause enormous losses. There is regrettable report that a toal of 9.7 million head sof animals died and hundreds of herders had no any livestock during winter and spring of 2009-2010 only.

Several years have been over since the times of seeing and feeling by herders and animal husbandry specialists the lack of natural palnts, water, salts and minerals, which are main raw materials of living factory – livestock, and proving, warning and noting about them by scientists.

Therefore, when we address the issues of adaptation of animal husbandry to climatic changes, it is necessary to discuss about optimal use and protection of resources of plants, water, salts and minerals first of all, and evaluate and conclude current situations. Actually future progresses of pastoral animal husbandry of our country should directly depend on how natural resources are properly utilized.

We are observing and herders are lamently talking about that of more than 2800 plant species growm in approximately 113 million ha rangelands of our country, more than 600 species are seen to be important for animal nutrition, but species of plants edible by livestock in any aimags and soums are decreasing in the last years, instead of them Artemisia spp and weed plants inedible by animals are prevailing, and values of pastures are declining.

Number of rivers, streams, ponds and lakes are drying off, ground water levels are lowering, many artisan wells are becoming waterless and rangeland water reserves and supply are warsening due to global climatic change and warming in the last years.

More than 20,000 of over 40,000 wells counted before 1990's in our country were motorized wells and remaining were artisan wells, and water supply for pastures was seen to reach more than 60%. However, more than 37,000 wells were counted in 2009, but only more than 10,000 are motorized wells, and over 20,000 are artisan wells, which reveal future of pasture water supply for livestock populations has been not so reliable.

As well, natural resources of salty marshes, which are accumulated and renewable within several decades, are becoming limited and its distributions are also decreasing.

Although total amount of annual precipitations does not drop in most areas, scientists are proving and warning about changes of precipitation characters, distributions and effects on soil and plants. For example, during 1960-1980, drizzling rains lasted for days, rain water is absorbed deeply into soil and reached plant roots, and pasture vegetation was greater, while in last years, mostly heavy showers occur and cause flooding due to lack of absorbing rain water into soil.

Precipitation becomes less in May or June, when pasture plants are inetsively growing. As a consequence, real condition of revival of natural pastures with shorter period of summer and autumn seasons, and formation of sufficient reserves of pasture plants to be used for winter and spring seasons can not be provided regularly.

As well, it has been observed that more frequent snowfalls, periodical colds and snow and dust storms in winter and spring in the last years than previous years have a tendency to encompass broader areas and be common characters.

In 2009 report of climatic change, there are facts about that Mongolian livestock body is becoming smaller and their productivity is reducing in the last years due to above mentioned real situations, which are adverse consequences of global climatic changes.

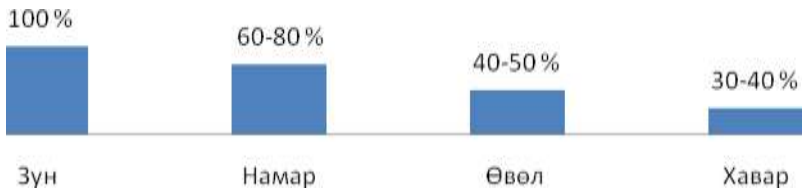
According to survey of more than 40 meteorological stations located in various natural and climatic regions of our country, weight of native Mongolian cattle dropped by 14-19 kg, sheep and goats by 7-8 kg, and wool yield of sheep decreased by approximately 90 g, which should not be left without paying attentions. In last years, favorable periods of summer and autumn are curtailed or last approximately 100-120 days, whereas severe winter and spring periods increased or last 220-240 days.

Based on all of these there is full evidence that pastoral animal husbandry in our country is under natural risk condition all year round.

During winter and spring seasons, livestock populations of our country loss 25-30% of their live weights gained in autumn in average and exhaust when warmer season arrives.

Why do livestock emaciate and exhaust during winter and spring?

1. Pasture plant production decreases



2. Duration of grazing on the pasture drops.

Summer and autumn – 13-14 hours

Winter and spring – 5-6 hours

3. Pasture plant nutritive values decrease.

Summer and autumn – 1 kg dry matter 0.9-1.0 fodder unit

Winter and spring – 1 kg dry matter 0.3-0.4 fodder unit

4. Pasture plant digestibility reduces.

Summer and autumn – 60-70%

Winter and spring – 50-60%

5. Feed consumption for pregnant and lactating animals increases.

Scientists demonstrated that pastoral livestock are able to eat only about 40-50% of their daily feed intake because production, digestibility and nutritive value of pasture plants, and grazing length decrease during winter and spring. On the other hand, nutritive demands (nutrients, minerals and biologically active matters) of pregnant and lactating animals

increase sharply during winter and spring. Demands of nutrients, minerals and biologically active matters of pregnant and lactating animals are greater by 30-40% as compared to male animals, barren females and early pregnant animals.

Ewes and does

Pregnancy	1	2	3	4	5
Calendar months	11	12	1	2	3

Cows

	First half of pregnancies					second half of pregnancy			
Pregnancy	1	2	3	4	5	6	7	8	9
Calendar months	7	8	9	10	11	12	1	2	3

It is essential that 50-60% of daily feed intake for livestock population during winter and spring seasons should be supplemental feed.

Therefore, it is undoubtful that our herder people must prepare supplemental feeds to be provided in winter and spring for 100-120 days of summer and autumn, and there are no any ways and solutions other than such activities for overcoming difficulties with minimal loss during zuds due to climatic changes and warming.

Manual preparation of only more than 50,000 tonn of feedstuff by herders in 2010 according to National statistics office data is seen to be unsatisfactory. Our country has more than 160,000 herder families, 60% of which have up to 200 heads of livestock. Therefore, at least over 60% of our herders are able to prepare manually feedstuffs for up to 200 heads of livestock sufficient in 180-200 days of winter and spring.

Successful overcoming of winter and spring periods depends on are herders active, initiative and responsible for manual preparation of feedstuffs relied on locally available resources of raw materials.

It is pleased to inform that this year, staff of our institute organized activities for production of hand made feedstuffs using such plants, which are inedible by animals during summer and autumn, as nettle, Artemisia spp, and Iris spp, broader advertisement via TV and radio broadcasting, and press, and demonstrations and training, published hand books and delivered them for herders free of charge. The possibility of making feedstuffs rich in more than 10 proteins and vitamins by using above plants was revealed, advertised and explained within our own capacity.

For example, a person is fully able to make dietetic feedstuff rich in proteins and vitamins by chopping and grinding daily 180-200 kg nettle and Artemisia spp, followed by drying in shadowy place. To make clear, it is possible to prepare 4-5 kg feedstuffs from each bunch of nettle, by mowing 3 times during summer and autumn. Besides of using mowed netlle in dried form, it can also be used via making twist, chops, flour and cake, as well as a number of mixed feeds combining with other feeds. Also, potential to produce range of hand made feedstuffs from Artemisia spp and Iris spp, and use them for feeding animals during severe winter and spring periods is open in any bags, soums and aimags of our country.

If measures for organizing regular training on preparation of hand made dietetic feedstuffs from these plants for herders at soum and bag levels, and supplying sufficiently them with related books, brochures, manuals and other necessary materials will be initiated by aimags and local authorities, and will become regular to be organized by relying on the intellectual resources and potentials of scientists and teaching staff of research institutes and universities, it can be a contribution to overcome zud disasters, which are adverse impacts of global climatic change, with minimal loss.

In order to overcome winter and spring severities and difficulties due to climatic changes, eradication of animal diseases and upgrading livestock populations are paramount, as well as our herders should work via their thinking and initiatives on economic turnover of livestock populations.

In our country, annually 24-25 million heads of livestock populations were being counted before 1990’s, male and barren females accounted for about 14-15% of total population, while males and barren females accounted for approximately 24% of total livestock population.

In other words, there is a possibility of overcoming zud severities with minimal loss by herders, improving their living conditions via consumtion of males and barren female animals for food and making economic turnover, and buying feeds from incomes gained from livestock selling.

The government should work with greater attentions and initiatives to ensure, support and go between for selling animal products made by herders in both international and domestic markets.

Castrated male and barren female animals, thousand heads

livestock	**Annual average**	
	1966-1968	2008-2009
Cattle	187.2	357.9
Sheep	1562.4	4105.0
Goats	544.0	5530.8
Total	2293.6	9993.7

The table reveals there were more than 2.0 million male and barren females nationwide in 1960-1970's, while they reached approximately 10.0 million heads by the end of 2009. It reveals it is possible to make economic return via selling only castrated males and barren female animals. Especially male and barren animals can be sold for meat production under current situation of overstocked pastures in all aimags and soums, and measures of arranging livestock population numbers adjusting to pasture stocking rate and carrying capacity in the areas can be implemented.

Herders are managers running animal husbandry practices relying on natural and their human, capital and financial resources, and they will be able to make contributions to combat with minimal risks against droughts and zuds due to climatic changes if they give special attentions, focus and work on proper distributions and optimal use of these resources.

Natural resources, which can be used by herders

- Natural and cultivated rangelands
- Natural and cultivated hay making
- Salty marshes
- Water sources and wells
- Vegetable fields

- Crop fields
- Forests
- Game animals accessible within legislations
- Medicinal and beneficial plants
- Fruits and berries

Human resources to be used by herders

- Human populations aged 16 years old and above
- Work force to be hired
- School age children
- Staff working in aimag and soum authorities and organizations
- Animal husbandry specialists

Capital and financial resources to be used by herders

- Livestock population
- Real estate
- Valuable assets
- Cash
- Securities

Conclusion

1. Global climatic changes and warming are more intensively detected in our country, exert adevrs effects on animal husbandry practices and cause enormous losses. There is regrettable report that a toal of 9.7 million head sof animals died and hundreds of herders had no any livestock during winter and spring of 2009-2010 only.
2. Herders are managers running animal husbandry practices relying on natural and their human, capital and financial resources, and they will be able to make contributions to combat with minimal risks against droughts and zuds due to climatic changes if they give special attentions, focus and work on proper distributions and optimal use of these resources.