

Contribution of livestock, including in poverty alleviation, food security and nutrition, sustainable livelihoods and the realization of the 2030 Agenda.

Background :

The importance of animal husbandry in Nepal's agricultural system has remained from time immemorial to today. The main objective of the Department of Animal Services is to diversify, commercialize, and contribute to the national production by developing animal husbandry as a profitable and respected profession. B.S. In 1996, a veterinary dispensary was established for the first time in Kathmandu according to the allopathic system and the said dispensary was B.No. It was converted into a veterinary hospital in 1996.

V.No. By 2014, animal hospitals were established in 10 districts. India, with the help of FAO / OXFAM, has set up 33 hospitals, 21 dispensaries and 18 check posts to provide services nationwide due to the increasing need for animal health services. Established by 2021. At this time, six animal development farms were also opened.



Realizing the lack of animal services to meet the increasing demand of animal husbandry business, B.S. In 2036, the Department of Animal Development and Animal Health (later named the Department of Animal Services) was reorganized. After that, animal service offices, service centers at village level, strengthening of

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laboratories and farms and some new farms were gradually established in all 75 districts.

V.No. In the year 2049, the Department of Agricultural Development was formed to include all the service agencies in the agricultural sector. After that, realizing the complexity and laxity in the service in terms of management, the Department of Animal Services was again formed on 1st Shrawan 2052.

Vission and Mission :

He is the head of Animal Services Department, who contributes to the national production by developing the animal husbandry business as a diversification, commercialization, economic and respectable profession, while the other objectives are as follows.

- To support the rural economy and to maintain regional balance, special attention should be given to animal husbandry business.
- To make a special contribution to improve the economic and social status of the poor and socially backward classes and women through animal husbandry.
- To develop the advanced animal husbandry profession as the main source of income of the farming family and help to protect the environment and maintain balance.
- To contribute to the safety of the country's livestock and the protection of public health, to expand the control services of special animal diseases.
- Helping the industry by providing raw materials through import substitution and exportable livestock production.
- Involve the private sector in commercial animal husbandry, resource development and conservation services and market management.
- To increase self-employment opportunities by encouraging the livestock and poultry production sector and related industries and trade.
- Expanding quality control and quality control services related to animal and poultry industry business.

The Role of Animal Biodiversity for Food and Agriculture :

Though Nepal is very rich in Animal Genetic Resources both in terms of diversity and numbers but these resources are exploited to a limited scale till now. Out of the total population, only 15% cattle and 36% buffaloes are estimated to be crossbred (Sherchand 2001, DoLP 2014). Similarly, the percentage of cross bred Animal Genetic Resources (AnGR) in other species of livestock (sheep, goats, pigs and poultry) is grossly estimated to range from 5 to 50% (5 to 10% in sheep and goats, 25% in pigs and 50% in poultry). Livestock can utilize the vast natural resources and convert these to high value nutritive food like milk, meat, eggs and draught

power and fertilizer to support agriculture production system. The share of Nepalese livestock to the national agricultural GDP is around 26.8% accounting food, fiber, power, fertilizer, fuel and transportation. The contribution of livestock sector has been reduced from 18 to 13% of GDP within last 15 years (ADS 2015). This situation can only be improved through the increase of productivity of livestock.

Identification :

Lime, Parkote, Gaddi and Tarai buffaloes are the main breeds of native buffalo which along with the Murrah breed contribute about 70% of the total milk production in Nepal. Buffaloes are considered to be the most economically important animals for milk and meat production. Among the local buffaloes Lime buffaloes are declining in number. Among cattle, Lulu, Achhami, Khaila, Pahadi, Terai and Sir along with the Yak, Nak and Chauries are popular in the country. It is bitter to note that Siri cattle which was perceived as the best performing indigenous cattle and found in the eastern part of Nepal, is believed to be gone extinct where as the number of Yak and Nak is reducing day by day because of cross breeding with local cattle and yak herders switching to other occupations like tourism and migration to other areas.

Khari, Terai, Sinhal and Chyangra (local goats) are the predominant type of goats for meat production which is acceptable to almost all entities of the Nepalese community. Khari goat performs best in term of fertility and meat production. Baruawal, Bhyanglung, Kage and Lampuchhre are the important sheep for wool and meat. Baruawal sheep are used for draught and can carry load up to 13 kg on their back.

Kage is smaller breed for meat and wool. Hurrah breed of pigs is reared at scavenging system of production in smaller scale. Chwanche (local pig breed) are also reared in backyard pig raising system in hilly areas. Bampudke pigs are the smallest breed and are on the verge of extinction in Nepal. Native (naked neck) and Puwankh Ulte (Dumse) are the breeds of indigenous poultry found in Nepal. The pigs are reared for meat and manure purpose by ethnic and marginalized people. Sakini, Ghanti Khuile native chicken is tastier than commercial type for meat and eggs and hence their products fetch higher prices in Nepal. In spite of their lower productivity they have their great potential for improving the production and productivity.

Broadly, livestock production system can be grouped into three major types: (a) Transhumant migratory system (b) Semi-migratory or semi-stationary with semi

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intensive and (c) Stationary stall feeding or closed system intensive farming. The migratory Transhumant system of movement of animals to the alpine meadows and temperate pasture in summer and to the lower altitude pastoral, forest and cropped areas around villages is the common animal production system in trans-himal region of Nepal. The herds of Yak, Nak, Chauries, Chyangra goat and Bhyanlung sheep are taken to the alpine meadows and temperate pasture for four months from June to September by keeping them in different pastoral areas depending on the feed availability and weather conditions.

Stationary with semi-migratory or with semi-intensive is more common in the mid hill region. The animals are kept in shed during night in winter months and are taken out for grazing during day time. In summer, the dry animals are taken to high pasture areas as migratory type. The high valued animals like lactating, pregnant and sick animals are kept in sheds around villages for intensive care and management. In winter animals are kept on moving in cultivated land for fertilizing the land from terraces to terraces. Baruwal sheep, Sinhal and Khari goats, Pahadi cattle, Chauries and buffaloes are reared in semi migratory type.

Call of FSN submission according to Contribution of livestock, including in poverty alleviation, food security and nutrition, sustainable livelihoods and the realization of the 2030 Agenda is a most important in this context will be effective issues of livestock role in Nepal.

In most the urban and peri-urban areas, animals are kept in stall feeding system where the animals are fed with straws and other crop by products along with concentrates with limited amount of green fodders. The non-ruminants are kept as closed system even in Tarai or in peri-urban areas. Farmers in dairy pocket areas have followed this type of animal production system in Nepal. Cross-bred cattle, buffaloes, Khari goats and Barbari goats are kept such a way.

Some of the livestock products are very popular in domestic and international market. Yak cheese from Nak and Chauries has been the valuable production in Nepal. The blending of Nepalese carpet from the wool of Bhyanlung breed of sheep has been well recognized in Europe and America. However, because of the decreasing Bhyanglung sheep population the Nepalese carpet industry has to depend on imported wool from Tibet, China and New Zealand. Chyangra has been used for Pashmina production. Pahadi black cattle and Terai white cattle along with some Jersey crossbred and Holstein crossbred are the important cattle which are important genetic resources for providing milk, manures and draught for sustainable agricultural production. Achhami (nine-palm height cattle) is popular in far western region for its smaller body size and production of strong bulls used

for plowing the sloppy terraces in the regions. Lulu cattle can be easily raised in the very harsh environmental regions, such as Manang and Mustang where they can produce reasonable volume of milk which is used for nutritional security in the region. They are also raised for producing organic manure and bulls for plowing lands even in windy and cold climates.

The State of Nepal's Biodiversity for Food and Agriculture 2017, MOAD Kage is smaller breed for meat and wool. Hurrah breed of pigs is reared at scavenging system of production in smaller scale. Chwanche (local pig breed) are also reared in backyard pig raising system in hilly areas. Bampudke pigs are the smallest breed and are on the verge of extinction in Nepal. Native (naked neck) and Puwankh Ulte (Dumse) are the breeds of indigenous poultry found in Nepal. The pigs are reared for meat and manure purpose by ethnic and marginalized people. Sakini, Ghanti Khuile native chicken is tastier than commercial type for meat and eggs and hence their products fetch higher prices in Nepal. In spite of their lower productivity they have their great potential for improving the production and productivity.

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The State of Nepal's Biodiversity for Food and Agriculture 2017, MOAD Roughly 70% of households keep some type of livestock. Farmers with small landholdings of between 0.2 and 0.5 ha keep almost 25 percent of the livestock, while people who have either no land or own less than 0.2 ha own about 11 percent of the livestock. Over half of the cattle, buffalo, goats, and sheep are kept in the hills, and about one third in the Tarai. Poultry production is characterized by traditional smallholder farms (100-300), and about 80 percent of commercial poultry farms are concentrated in urban and peri-urban areas. In the last two decades, growth in animal numbers contributed a significant proportion to output growth, while productivity levels have not significantly increased. Nevertheless, the livestock sub-sector has been one of the fastest-growing sub-sectors in agriculture during the 1990s, averaging around 2.4 percent growth annually, accelerating from 1.6 percent during the first half of the 1990s to 3.6 percent in the second half. Nepal runs a deficit on its trade balance, even though agricultural trade records a positive balance (FAO 2005).

The livestock are assets used as emergency capital and live cash. It provides nutrition (milk, meat and eggs), soil nutrients (manure, urine and decaying carcasses), energy (draught power, transportation and fuel), animal fiber (wool, pashmina and hair), and carcass by-products (bone, hide and skin). It is also associated with religious sentiments. Some of the animals, like, cattle are worshiped as a god/goddess in majorities of Hindu and Buddhist communities. As the larger proportion of the livestock by-products are consumed in urban centers,

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and by the well-off non-farming families, the livestock sector is a major source of cash in rural areas and for the poorer households. Livestock sub-sector plays a significant role by contributing about 11.5% of total country GDP and 26.8% to the agricultural sector (MOLD 2017).

The State of Nepal's Food and Agriculture 2017, MOAD to be scaled up at wider scale. In-situ conservation programs, particularly at farmers' community level are going on and ex-situ conservation is also focused for endangered and local breeds in the country.

Provision of actions livestock sector :

National Agricultural Policy (2004); Agro bio-diversity Policy (2007); Animal Breeding Policy (in draft); National Biodiversity Strategy (2002) and revision of national biodiversity strategy and action plan (2014-2020) under preparation. The national biodiversity strategy and action plan has the provision of integrating agro-ecosystem approach for AnGR management.

National Livestock Breeding Centre, Pokhara, under DLS has been involved in the artificial insemination (AI) program particularly with introduced bulls (Jersey and Holstein-Friesian cattle and Murrah buffalo), also in goats (Sannen and Boer) indifferent parts of the country. Animal Breeding Division, NARC has initiated ex-situ cryopreservation work for Achhami cattle.

Developed and strengthened the resource centers identified elite breeder in dairy cattle buffalo, pig and goat.

Regulatory policies and laws for protection of indigenous breeds and benefit sharing. Risk minimizing measures. Subsidy and insurance policies.

Inventory and early warning system.

Youth targeted commercial livestock programs for income and employment generation.

Livestock-based poverty reduction and food and nutrition security program in remote mountainous and hill districts of Nepal.

Suaahara program of small-scale livestock farming for 1000 golden days nutritional supplement program for pregnant and lactating women.

Gaps and priorities :

Inadequate resources incentives, financial and skill human resources, laboratory and other infrastructure facilities.

Limited awareness and knowhow about proven technologies

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- Inadequate coverage of research and development and extension services
- Lack of system approach in tackling challenges related to AnGR conservation and promotion.
- The State of Nepal's Biodiversity for Food and Agriculture 2017, MOAD Limited use of regulatory policies and laws as well as code of practices for different livestock farming
- Weak implementation of land use management policy, safety regulation policy subsidy and research support policy
- Use of multi species, multi breed herds to maintain high diversity on farm niches Effective participation of indigenous people and local communities local stakeholders.
- Less priority on documentation and reorganization and use of traditional knowledge and practices of local communities
- Promotion and preservation and utilization of traditional knowledge as well as proven technology.

Increase in public education participation and awareness :

- Promotion of Institutional and socio economic enabling environment such as incentive measure Voluntary sharing of knowledge and good practices Expand public investment and incentives to ensure sustainable management practices.
- Enhance national and international knowledge sharing cooperation capacity building and exchange of good livestock farming management practice Promotion to increase consumption of local species and varieties through awareness and market intervention Promotion of subsidy and incentive to farms for conservation and utilization in PPP model

Conservation systems for AnGR :

However, the packages of practices and incentive measures for indigenous cattle, eg, Lulu and Achhami, from indigenous buffalo like Lime, Parkote and Gaddhi have the conservation programs are not enough. Some ex-situ programs, such as collection of semen from been started in ABD, NARC, Khumaltar. The same type of programs have been planned to be started soon in National Livestock Breeding Center, Pokhara, under the DLS. The in-vitro conservation measure side, are mainly guided by the socio-economic, cultural and geographical aspects rather than the is not practiced for the conservation of AnGR till now. The conservation practices, from the farmer's conservation. There is a need to have the provision of well defined direct & indirect incentive knowledge of the importance of AnGR in the areas of genetic improvement and/or livestock biodiversity its mechanisms for

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the farmers in the specifically selected areas.

□ In-situ conservation and management activities :

DOLP in association with respective District Livestock Services Offices (DLSO) and farmers' groups has been launching in situ conservation programs for the indigenous animals, like, Lulu and Achhami cattle, Lime and Parkote buffalo, Lampuchchhre sheep, Hurrah and Bampudke pigs, Sakini, Ghantikhuile and Pwankh ulte (Dumse) chicken and Yak and Chauri in different districts of Nepal. Activities to maintain traditional knowledge

The per capita per annum meat and milk consumption is 11.2 kg and 64 kg respectively which is far below the requirement. The per capita requirement has been estimated to be 14 kg meat and 91 kg milk (DLS 2015). These data have demanded more animal products and hence there is ample scope of livestock industries in Nepal. Government of Nepal has initiated new approaches and campaigns for livestock breed improvement, forage production, animal health and human resource development. These new initiative of technology especially the breeding processes of livestock may hinder the sustainability of biodiversity. The adverse consequences have been arisen in many situations; however different counter measures have been adopted in last decade.

System in Nepal :

Though the number of livestock per household is quite higher in size, however their productivity is very less. The selection method for breed improvement had been adopted to enhance the production and productivity of livestock. There has been change in care and management of livestock in different parts

The State of Nepal's livestock Biodiversity for Food and Agriculture 2017, MOAD of country. The scientific shed has been reconstructed in many places; people have been encouraged to practice the intensive selection and rear the indigenous livestock as commercial enterprises.

□ The State of Intervention in the Conservation and Use of Animal Biodiversity Major policies, strategies, acts and regulation.

The following are the major policies (endorsed or in the process of endorsement), strategies, acts, regulations and programs that address conservation and sustainable utilization of farm animal livestock biodiversity in the country.

Incentives or benefits to support activities for the conservation and use of animal biodiversity Direct payment of incentives or subsidies is not a common system in

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Nepal for promotion of conservation of farm animal genetic resources. However, support services including vaccination, drenching, shed improvement are being provided to the farmers involved in in-situ conservation of Achhami and Lulu cattle, Gaddi, Lime and Parkote buffalo, Lampuchhre sheep under Department of Livestock Services/Directorate of Livestock Production/ District Livestock Service Office. Similar supports are provided to the farmers in the occasional projects that are implemented by various NGOs/Development agencies. Support from the government for livestock farmers for commercialization is also available. Future Agendas for Management.

In addition need to document reproductive parameters like birth weights, mature weight, milk yields, calving or kidding intervals. All these will help the country like Malawi to develop their own improved breeds which are of high productivity and adapt well to the changing climate. **Process:** For all these to work well there is no one size fits all program or process. The low income countries like Malawi can not have the same tools to develop small scale livestock productivity like those so called small scale farmers in developed countries where the use of technologies are high than in third world countries. and also the use of exotic breeds which drain farmers energy and resources in the end getting the same yield like those local breeds.

Through recognizing the role of women in the small-scale livestock subsector requires recognition of the role of women-led households, and organizations freely formed by women farmers and farm workers to represent their interests. The tool should support a rights-based approach that would enable women, indigenous peoples and vulnerable groups within the small-scale livestock subsector to participate in decision-making through collective self-representation and ensure access to the resources necessary for the sustainable enhancement of livestock productivity.

in 2022, we conducted a number of surveys of our women members engaged in small-scale livestock production in India, Pakistan, and Bangladesh. The focus was on animal health. One of the findings was that although the majority of women tended livestock, they were excluded from decision-making and the management of resources in their household and village.

Related to this is the need to give greater visibility to efforts to reduce emissions and successful climate mitigation and adaptation practices in the small-scale

livestock sector. We have good examples of this based on the experience of our membership in the Self-Employed Women's Association (SEWA) in India.

The voluntary guidance tool for the sustainable improvement of smallholder livestock productivity is, in my view, a crucial element that must be put in place, bearing in mind that small-scale livestock farming in developing countries is of paramount importance for food security.

Indeed, small-scale livestock farming is a large source of animal protein supply for populations in urban and peri-urban areas, both qualitatively and quantitatively. For example, the voluntary guidance tool for sustainable improvement of smallholder livestock productivity will contribute not only to safeguarding the livelihoods of smallholder livestock farmers, but also to reducing rural poverty and creating stable employment.

- Access to quality production inputs (genetic material);
- Mastery of breeding techniques;
- Housing of animals, livestock materials and equipment;
- Animal feed;
- Animal health;
- Marketing of livestock products, etc.

This tool will have to integrate a holistic approach to diagnosing smallholder livestock and will have to be easily adaptable and manipulated by both smallholder managers and smallholder farmers themselves.

Need for Intervention:

Livelihood Support: Small-scale livestock farming is often a primary source of income for rural households. Improvements in productivity can contribute significantly to poverty alleviation and economic development.

Food Security: Livestock products constitute a vital component of the diet in Pakistan. Enhancing productivity can contribute to improved food security at both the household and national levels.

Market Competitiveness: Improving the productivity of small-scale livestock farming can enhance the competitiveness of local products in domestic and international markets.

Scope of Improvement:

Breeding Programs: Implementing selective breeding programs to enhance the genetic potential of livestock breeds commonly found in small-scale farming.

Nutrition Management: Introducing better nutrition management practices to optimize feed efficiency and enhance the overall health of livestock.

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Healthcare Interventions: Implementing disease control and prevention measures to reduce mortality rates and improve overall herd health.

Capacity Building: Providing training and extension services to small-scale farmers to enhance their knowledge and skills in modern livestock management practices.

The majority of the small-scale farmers rear livestock under an extensive management system. There is a lot of potential at the village level for small-scale farmers to rear livestock. Availability of grazing grounds & water, low labour cost due to participation of family members, market facilities and low cost of production are the major potentials. Similarly, there is potential to popularize these livestock species among the women in the villages as many are facing issues with day-to-day household management due to the present economic crisis and lack of employment opportunities. In addition, the smell of livestock (houses) is also objected to by some villagers discouraging the engagement of farmers in livestock rearing.

The development of an optional guidance tool dedicated to improving the productivity of small-scale livestock is important, if not essential, for developing countries because states rely on their production to feed the population and sell the surplus abroad.

I am writing to provide my suggestions and views on the proposed objectives, scope, nature, and process for the development of a dedicated voluntary guidance tool for the sustainable enhancement of small-scale livestock productivity.

Policy Advocacy: Encourage policies that incentivize the development of technologies aligned with small-scale and sustainable principles. This may involve creating a supportive regulatory environment and financial incentives for sustainable technology initiatives.

Participatory Approach: Adopt a participatory approach involving small-scale farmers in the decision-making process. Their involvement ensures that the guidance tool is practical, culturally sensitive, and responsive to their needs.

Multi-Stakeholder Collaboration: Facilitate collaboration between public and private institutions, NGOs, and local communities. A multi-stakeholder approach ensures diverse perspectives and resources are considered.

Economic Importance Recognition:

Small-scale farmers often sell their livestock to larger processing plants, contributing significantly to the overall economy. The guidance tool should emphasize the economic importance of these transactions and advocate for

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accurate measurement methodologies that reflect the true value generated by small-scale production.

Policy Advocacy for Recognition: Encourage policy changes that recognize the economic contributions of small-scale livestock farmers, even when their products enter larger processing plants. This recognition is essential for justifying increased support, investment, and tailored policies to address the unique challenges faced by small-scale producers.

Public Awareness: Advocate for public awareness campaigns to highlight the economic significance of small-scale livestock production. By educating the public and policymakers, the tool can contribute to a greater understanding of the role played by small-scale farmers in the overall agricultural landscape.

Contribution of livestock, including in poverty alleviation, food security and nutrition, sustainable livelihoods and the realization of the 2030 Agenda. majority of cattle are traditional and are mainly reared in villages by individual farmers and pastoralists. However, high demand of milk in towns and cities has led to increased rearing of cross-bred exotic cattle in farms and in the backyard of urban and peri-urban settlements for commercial milk production.

Conclusions :

Nepal is a mainly agricultural country still around the 65 percent peoples in agriculture. Although every households peoples keeping in their business in livestock sector. Their livelihood depend on fulfill their problems.

References :

<https://agsci.colostate.edu/smallholderagriculture/calorie-energy-balance-risk-averse-or-hunger-exhasution/>

<https://agsci.colostate.edu/smallholderagriculture/ethiopia-diet-analysis/>

References

ADS. 2015. Agricultural Development Strategy (ADS). Ministry of Agricultural Development, Government of Nepal, Singhadarbar, Kathmandu, Nepal, September 2014.

AICC. 2008. Agricultural diary. Agricultural Information and Communication Centre. Ministry of agriculture and cooperatives, Kathmandu, Nepal.

AnGR. 2013. Country report supporting the preparation of The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture, including sector-specific data contributing to The State of the World's Biodiversity for Food and Agriculture.

Contribution of livestock, including in poverty alleviation, food security and nutrition, sustainable livelihoods and the realization of the 2030 Agenda.

- APP. 1995. Agriculture Perspective Plan. National Planning Commission, Kathmandu, Nepal.
- Aryal IK. 1998. Preference for coloured pigs in the Hills of Eastern Nepal. Proceedings of the Fourth Global Conference on Conservation of Domestic Animal Genetic Resources, NARC and Rare Breeds International.
- CBS. 2011. Nepal Living standards survey 2010/11. Central Bureau of Statistics, Kathmandu: Government of Nepal.
- DLS. 2015. Annual progress report. (Department of Livestock Services, Ministry of agricultural Development, Kathmandu, Nepal).
- DOLP. 2015. Directorate of Livestock Production, Department of Livestock Services, Nepal.