

**Project Concept Note on
Genetic Improvement and Strengthening of Buffalo Farming
in Lumbini Province, Nepal**

Type of Project:

Special Grant from National Planning Commission, Nepal

Geographic focus area:

Lumbini Province, Nepal

Nawalparasi (West), Rupandehi, Kapilvastu, Dang, Banke, Bardiya

Duration of the project:

2026 to 2029 (3 years)

Total budget requested:

NRS 10 crores

Submitted by

**Ministry of Agriculture, Food Technology and Land Management,
Lumbini Province, Butwal, Nepal**

2nd February, 2026

1. Executive Summary

In Nepal, buffalo (*Bubalus bubalis*), commonly called “Black Gold,” is the economically, socially and climatically most suitable multi-purpose livestock contributing 63% to the country’s total milk supply (MOALD, 2023). Nepal is 4th in buffalo population and 5th in buffalo milk production globally. Although there are over 5.3 million buffalo in the country (MOALD, 2023), their contribution towards enhancing nutritional security, income and livelihoods of smallholder farmers have not been fully realized mainly due to low level of investment in research, resource center development for seed animal production and technology transfer.

Buffalo farming is a cornerstone of livestock-based livelihoods and national food security in Nepal, contributing more than half of total milk production and a significant share of meat supply. Lumbini Province, particularly its southern Terai belt, (HULAKI SADAK CORRIDOR) holds one of the largest and most strategic buffalo populations in the country. Despite this potential, productivity remains low due to weak genetic base, limited access to quality breeding inputs, inadequate fodder systems, fragmented herd size, limited commercialization, and underutilization of existing genetic recording systems.

This proposal seeks support for a three-year provincial program titled “Genetic Improvement and Strengthening of Buffalo Farming in Lumbini Province, Nepal” The program builds directly on the findings and recommendations of the 2022 comprehensive buffalo study conducted in the province. The proposed intervention will focus on structured genetic improvement through establishment of breeder and multiplier herds, expanded use of quality Murrah semen and bulls, strengthened artificial insemination services, fodder and health system improvement, and institutional capacity building leveraging already established national systems such as the Pedigree Performance Recording Scheme (PPRS) and The Africa Asia Dairy Genetics Gains to accelerate genetic progress.

A core feature of the program is the promotion of a commercial buffalo farming model of minimum 10 buffaloes per farmer, shifting buffalo rearing from subsistence orientation to economically viable scale. Parallely, the program will lay foundations for export-oriented

buffalo meat production, addressing animal health, traceability, biosecurity, and slaughter standards required for regional and international markets.

With a total budget of NPR 20 crore over three years, the program aims to improve buffalo productivity, enhance farmers' income, reduce dependence on live animal imports, and contribute to milk and meat self-sufficiency. The initiative aligns with the National Livestock Breeding Policy 2078, Agriculture Development Strategy, and the 15th Periodic Plan, and is designed for scalability and long-term sustainability.

2. Background and Rationale

Agriculture remains a major pillar of Nepal's economy, with livestock contributing approximately 27 percent to agricultural GDP. Within the livestock sector, buffalo is the dominant species, producing over 57 percent of national milk and more than one-third of total meat output. In Lumbini Province alone, buffalo population exceeds 1.1 million, of which nearly 70 percent are concentrated in the southern Terai districts.

The 2022 provincial study revealed that average daily milk yield of buffaloes in the southern districts is around 5 liters, significantly lower than the genetic potential of Murrah and improved Murrah crosses. Artificial insemination coverage in buffalo remains below 11 percent, compared to more than 40 percent in cattle. Natural service using non-descript or community bulls is still common, increasing risks of inbreeding and low productivity.

The study further highlighted systemic gaps: absence of breeder and multiplier herds, weak pedigree and performance recording, inadequate fodder availability, irregular vaccination and health services, limited laboratory facilities, and insufficient technical human resources. Farmers face high feed costs, lack of affordable credit, weak market linkages, and minimal access to output-based incentives.

Given the strategic importance of buffalo for food security, nutrition, and rural income, a focused, province-led genetic improvement and strengthening program is both timely and necessary. This proposal translates the study's recommendations into an actionable, time-bound investment program suitable for national-level support.

3. Objectives

3.1 Project Goal: Enhancing the production and productivity of Buffalo milk and meat through buffalo breed improvement through sustainable breeding and . Enhancing Nutrition, Income, And Livelihoods of Smallholder Farmers in Lumbini Province of Nepal Through Improvement of Buffalo Production and Value Chain.

3.2 Overall Objective

To enhance productivity, profitability, and sustainability of buffalo farming systems in the southern part of Lumbini Province through structured genetic improvement and system strengthening.

3.3 Specific Objectives

1. To establish and operationalize breeder and multiplier buffalo herds following national breeding standards.
2. To improve the genetic merit of existing buffalo populations through expanded and effective use of quality Murrah semen and bulls by establishment of community Livestock breeding center.
3. To strengthen fodder, feeding, and health management systems for improved productivity.
4. To enhance institutional and human capacity for buffalo breeding, recording, and service delivery.
5. To improve market orientation and income opportunities for buffalo farmers.

4. Project Vision

From the proposed activities in this research project, we expect the following changes in the short term and long term as synergistic results collectively leading to development of the buffalo/dairy/ buffalo meat value chain through breeding improvement and ultimately better household incomes, family nutrition and commercialization of buffalo farming.

4.1 Short-term:

Providing the seed animals, scaling up of the cultivation of improved fodder/forages and use of conservation technology along with feed additives including those related to enhancing rumen microbial activities for better digestion of feedstuffs will provide scientific options needed to improve buffalo nutrition, especially for smallholders. Simultaneous research work determining factors underlying low breeding efficiency (poor fertility) in buffalo will provide practices to improve breeding performance (including AI using an improved buffalo breed). Accordingly, due to expected synergistic effects of improved feeding management and breeding strategies along with better health management, at least a 40% increment in milk yield can be attained. This will have a tremendous impact at the household level in improving the nutritional status of smallholder family members by buffalo calf fattening program.

4.2 Long-term:

The long-term impact will be achieved mainly due to continuation and up-scaling of short-term efforts. The following positive changes are envisaged that will have an overall impact in improving buffalo commercialization through improved productivity in buffaloes.

- High genetic merit buffalo and fodder/forage resources - including a fodder trees resource center - will be established selected milk shed areas. This perennial source of improved planting materials will provide a tremendous benefit in improved fodder production and thereby feeding management, especially for smallholders. The buffalo calf fattening program will be milestone for buffalo genetic resource and meat production if of low milk productivity.
- Buffalo health will be significantly improved through the established protocol of mass screening against contagious and communicable diseases. These efforts will be tightly linked as the Veterinary Hospital and Livestock Services Expert Center (VHLSEC) to provide better health services.
- Zoonotic diseases of buffalo origin will be identified, prevented and controlled, contributing to improved public health.
- Standard breeding protocols at community buffalo Breeding center will be in common use, driving significant changes in buffalo fertility status and producing genetically superior buffaloes based on the local nondescript and cross bred population.
- Consumption of safe milk and milk products will be increased and barriers to consumption decreased.

- The buffalo value chain will be greatly strengthened through the contributions of smallholders in local dairy cooperatives, commercial farms and other forms of milk collection, which will ultimately benefit farmers in earning more profit through increased milk production.

5. Project Coverage and Target Groups

Geographic Coverage: Buffalo Farming strategic areas will be selected

S N	District	Municipality/Rural Municipality	Ward/ Tole
1	Nawalparasi	Susta Rural Municipality, Pratapur Rural Municipality, Palinandan Rural Municipality, Sarawal Rural Municipality, Wards No. 1, 6, 7, 12, 13, 24, 15 of Bardaghat Municipality, Wards No. 2, 4, 9, 11, 12 of Sunwal Municipality	At least 5 Buffalo pocket areas in each municipality of each districts
2	Rupandehi	Rohini, Devdah, Ward No 1,2,11,12, Maya debi, Ward No 2,3,4,5, Siddharth Nagar Ward No 9,10,11 Marchwari, Sammarimai, Lumbini Cultural, Gaidahwa, Ward No 2,3,4,5 Siyari, Ward No 1,2,3,4, Suddhodhan Ward No. 4,6,7, Sainamaina Ward No. 1, Ward No. 2,4,7,8,11, Butbal 12,13,17,18,19, Tilottama Ward No. 14,16,17	

3	Kapilvastu	Suddhodhan Ga Pa, Mayadebi Ga Pa, Esodhara Ga Pa, Kapilbastu Na Pa Ward No 3,4,6,9,10 Maharaj Ganj Na Pa, Krishna Nagar Na Pa, Bijayanagar Ga Pa, Shivraj Na Pa Ward No 2,3,5,6,7,8,11 Buddhabhumi Na Pa Ward No 5,6,8,10 Bardganga Na Pa Ward No 1,2,4,8,9,10,11	
4	Dang	Rajpur Ga Pa, Garhwa Ga Pa, Rapti Ga Pa Ward No 3,4,6,8, Lamhi Na Pa Ward No 1,2,3,4,6,7,8	
5	Banke	Rapti Sonari Ward 2, 6, 7, 8, 9, Narenapur Ward No 4, 5, 6, Duduwa Ward No 1, 2, 5, 6, Baijnath Ward No 1, 2, 5, 6, Khajura Ward No 1, 2, 3 and Nepal Ganj UP Mahanagar Ward No 19 and 20	
6	Bardiya	Badhaiyatal. Ward No. 1,2,3,6,7,8, Guleria Ward No. 1,2,3,8,9,11 Madhuban Ward No. 4,5,6,7,8 Geruwa Ward No. 1,2,3 Raja Pur Ward No. 1,4,5,6,7,8 Thakurbaba Ward No. 2,5,6,9, Barbardia Ward No. 2, 3, 7, 9 Basgadhi Ward no. 6, 7, 9	

Target Groups

Smallholder and commercial buffalo farmers/farms

- Marginal Farmers groups and dairy cooperatives
- Breeder and multiplier herd operators
- Veterinary and AI service providers
- Local governments and provincial livestock institutions

We will select five “**buffalo pocket sites**” per municipality in each district, with high buffalo production potential and proximity to milk market and dairy cooperatives.

For this project, we define commercial buffalo farmers as those with at least 3 adult buffalo and having 0.5 ha land or less. Farmer field schools (FFS) with community buffalo breeding centres (1/municipality) will be selected in consultation with stakeholders including farmer (cooperative) representatives. For all objectives, initial baseline survey and training work will start at these pocket sites with project scaling efforts expanding from these sites to more remote areas. All training efforts will start with training-of-trainer (TOT) for Village livestock promotor (n=25/district) and local farmers (targeting youth and women) in collaboration with International Livestock Research Institute, ILRI, SAPLING model.

By implementing this project as having high potential to contribute to provincial economic development, a Buffalo Genetic Resource Center with a nucleus herd and a bull mother farm, multiplier farms and buffalo calf rearing/ fattening farms has been proposed to be established in each districts with support from Special grant from National Planning Commission, Nepal.

6. Project Components and Activities

The project is designed as a comprehensive, system-based intervention addressing genetic, technical, institutional, and market constraints simultaneously. Each component is aligned with existing national systems and policies, avoiding duplication and ensuring sustainability.

Component 1: Genetic Improvement and Breeding System Development

- Identification of elite buffaloes based on milk yield and performance
- Establishment of 4–6 breeder herds and 20–25 multiplier herds
- Import or procurement of high genetic merit Murrah semen and selected bulls
- Expansion and quality control of buffalo AI services
- Strengthening and systematic use of the existing Pedigree Performance Recording Scheme (PPRS) and Integration of The Africa Asia Dairy Genetic Gains (AADGG) tools for digital recording, genetic evaluation, sire ranking, and monitoring of genetic progress at herd, district, and provincial levels

Component 2: Fodder and Feeding System Improvement

- Promotion of seasonal, perennial, and leguminous fodder crops
- Support for silage and straw treatment technologies
- Distribution of fodder seed and planting materials
- Demonstration of balanced ration and mineral supplementation

Component 3: Animal Health and Biosecurity Strengthening

- Regular vaccination campaigns against major diseases
- Deworming and herd health programs
- Strengthening of basic laboratory facilities at district level
- Mobile veterinary and AI camps in underserved areas

Component 4: Capacity Building and Institutional Strengthening

- Training of farmers on breeding, feeding, housing, and record keeping
- Refresher training for AI technicians and veterinary staff
- Exposure visits to model buffalo farms within and outside the province
- Development of standard operating procedures and technical guidelines

Component 5: Market and Value Chain Support

- Strengthening milk collection and quality control systems
- Support for cooperative-based marketing
- Promotion of basic milk processing and value addition
- Linkage with credit, insurance, and subsidy schemes

7. Implementation Arrangement

Institutional Framework

Directorate of Livestock and Fisheries Development (DOLFD) under the Ministry of Agriculture, Food Technology and Land Management, Lumbini Province will serve as the lead implementing agency. Implementation will be carried out in close coordination with the

Directorate of Livestock and Fishery Development, Veterinary Hospital and Livestock Service Expert Centers, National Livestock Breeding Office (NLBO), Nepal Agriculture Research Council, local governments, cooperatives, and private sector stakeholders.

A Provincial Buffalo Genetic Improvement Steering Committee, chaired by the Secretary of Ministry, will provide strategic oversight. A Technical Working Group chaired by Director general of DOLFD, comprising breeding, nutrition, health, and data management experts will guide technical quality, particularly Progeny Performance Recording Scheme (PPRS) and Africa, Asia Dairy Genetic Gain (AADGG) implementation.

Livestock Development Section of local governments will play a key role in farmer selection, infrastructure support, service delivery, and monitoring.

A Provincial Project Steering Committee will provide policy guidance, while a Technical Working Group will oversee breeding standards, monitoring, and technical quality.

8. Implementation Timeline (3 Years)

Year 1: Preparatory work, SOP development, selection of sites and herds, procurement of semen and bulls, initiation of training and fodder programs.

Year 2: Full-scale implementation of breeding, AI expansion, fodder and health interventions, performance recording, and mid-term review.

Year 3: Consolidation, scaling of successful models, market strengthening, impact assessment, and sustainability planning.

9. Monitoring and Evaluation

A results-based monitoring and evaluation framework will be adopted. Key indicators will include AI coverage in buffalo, average milk yield, number of improved progeny produced, functional breeder and multiplier herds, farmer income changes, and service delivery performance.

Quarterly progress reporting, annual reviews, and a final evaluation will be conducted. Digital record keeping and regular field verification will be emphasized.

10. Sustainability and Risk Management

Sustainability will be ensured through farmer ownership of herds, cooperative-based service delivery, cost-sharing mechanisms, and alignment with existing provincial and local government programs. The use of national systems such as PPRS and AADGG ensures continuity beyond the project period. Breeder and multiplier herds will operate on commercial principles, while local governments will gradually absorb service delivery costs.

Key risks include disease outbreaks, reluctance of smallholders to upscale herd size, feed shortages, and weak market access. These will be mitigated through strict biosecurity, phased adoption of the 10-buffalo model, fodder development planning, insurance linkage, and cooperative-based marketing.

The project also builds climate resilience through fodder diversification, manure management, and reduced unplanned animal movement.

Sustainability will be ensured through farmer ownership of herds, cooperative-based service delivery, cost-sharing mechanisms, and alignment with existing provincial and local government programs. Risks such as disease outbreaks, feed shortages, and weak coordination will be mitigated through strengthened health systems, fodder planning, and institutional coordination.

11. Expected Outcomes

11.1 Improved Livelihoods and commercialization:

11.1.1 Increased Income through commercialization:

By enhancing buffalo productivity and market access, farmers can expect higher incomes from selling milk, meat, and other dairy products.

11.1.2 Employment Opportunities:

The growth of the buffalo value chain could create more jobs in farming, processing, and marketing sectors.

11.2 Enhanced Nutrition and health benefits:

11.2.1 Better Access to Nutritious Food:

Increased availability of buffalo milk and dairy products can improve dietary quality for local communities.

11.3 Sustainable Agricultural Practices:

11.3.1 Climate Resilience: Adoption of climate-smart practices helps farmers adapt to changing environmental conditions.

11.3.2 Efficient Resource Use: Improved feeding practices reduce waste and enhance resource efficiency.

11.4 Market Development:

11.4.1 Market Access Expansion: Strengthening market links enables farmers to sell their products at better prices.

11.4.2 Product Diversification: Encouraging production of diverse dairy/meat products increases market opportunities.

11.5 Social/Gender Inclusion:

6.5.1 People from disadvantaged group, geography /women's participation in decision-making processes related to buffalo farming is likely to increase as part of inclusive policies.

11.6 Policy Support:

Engagement with policymakers ensures that supportive policies are developed or strengthened for sustainable livestock development.

11.7 Capacity Building:

Training programs for farmers on structured breeding programs, improved breeding techniques, disease management, and financial literacy enhance overall capacity within the sector.

12. Logical Framework:

Logical Framework for “Genetic Improvement and Strengthening of Buffalo Farming in Lumbini Province, Nepal”

Narrative Summary	Objectively Verifiable Indicators (OVIs)	Means of Verification (MoV)	Assumptions / Risks
Goal			
To commercialize buffalo farming through sustainable buffalo breed improvement for enhanced milk and meat production.	Household income from buffalo farming and level of commercialization increased by 50% within 3 years.	Records of increased milk and meat productivity; market surveys.	Stable market demand for milk and meat.
Increased participation of households among project beneficiaries.	At least 5,000 households engaged in commercial buffalo production and 50 cooperatives engaged in the buffalo value chain.	National poverty statistics; household surveys; cooperative records.	Supportive government policies for livestock development.
Objectives			
Establish a sustainable buffalo breed improvement system that increases milk and meat production while commercializing buffalo farming among marginalized groups.	50% increase in average buffalo milk production (from 3 L/day to 5.6 L/day).	Cooperative records; productivity reports; field monitoring data.	Farmer adoption of improved breeding and management practices.
Establishment of Community Buffalo Genetic Resource Centres in Kapilbastu, Rupandehi, and Bardiya districts.	Functional Buffalo Genetic Resource Centres established and operating with 100 high genetic merit buffaloes at farmer-managed facilities.	Infrastructure completion certificates; site visit reports.	Availability of suitable farmers and local institutional support.
Development of commercial buffalo production pockets (multiplier herds).	2,500 commercial buffalo farms established, with at least 5 productive buffaloes per household.	Household surveys; cooperative financial records.	Adequate fodder and water availability.
Outputs			
1. Enhanced buffalo productivity through improved breeding, feeding, and health care practices.	100% vaccination coverage of buffaloes in the project area.	Veterinary service records; field monitoring reports.	Timely availability of vaccines and veterinary services.
2. Buffalo Genetic Resource Centres established in	Genetic Resource Centres established and	Infrastructure completion reports;	Effective coordination with

project districts.	operational in all project districts.	operational records.	local authorities.
3. Community Buffalo Breeding Centres established (AI/community-based).	300 AI / community buffalo breeding centres established and functioning.	AI service records; field supervision reports.	Availability of trained technicians and semen supply.
4. Technicians (Village Livestock Promoters) and farmers, especially women and marginalized groups, empowered through capacity building.	At least 50% of training participants are women or members of marginalized groups.	Training attendance sheets; training evaluation reports.	Willingness of women and marginalized groups to participate.
5. Improved infrastructure for buffalo rearing and product processing.	Construction of 1,000 improved buffalo sheds at community level and 50 milk collection centres in the project area.	Infrastructure completion certificates; site visits.	Timely fund disbursement and contractor performance.
6. Strengthened market linkages for milk and meat products.	At least 80% of project farmers selling products through cooperatives or formal markets by Year 3.	Cooperative sales records; market contracts.	Stable prices and reliable buyers.
Activities			
A1. Conduct Farmers Field School training on buffalo health care, feeding, breeding, and farm management.	At least 20 training sessions per year conducted.	Training schedules; attendance records; participant feedback forms.	Availability of trainers and farmer participation.
A2. Distribution of improved buffalo germplasm and strengthening AI services (including import/procurement of Murrah semen and selected bulls).	200 improved breed buffaloes / germplasm packages distributed.	Distribution records; follow-up productivity monitoring reports.	Import clearance and quality assurance of genetic material.
A3. Develop infrastructure for buffalo sheds, processing units, and milk collection centres; establish breeder and multiplier herds.	At least 15 facilities constructed or upgraded; 4–6 breeder herds and 20–25 multiplier herds established.	Infrastructure progress reports; site visits; photographic documentation.	Land availability and community cooperation.
A4. Strengthen and systematically use PPRS and integrate AADGG tools for digital recording and genetic evaluation.	At least 5 cooperatives established or strengthened using PPRS and AADGG tools.	Cooperative registration documents; digital records; meeting minutes.	Reliable digital infrastructure and technical support.

A5. Facilitate partnerships with markets, processors, or export agencies.	At least 10 formal agreements signed with buyers or processors.	Signed contracts; cooperative sales data showing increased volumes.	Continued interest from private sector partners.
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- **Key Assumptions**

- Adequate availability of fodder resources through community forestry programs.
- Stable government support for livestock development policies.
- Farmers are willing to adopt modern farming techniques.
- Market conditions remain favorable for dairy and meat products.

13. Budget Estimation for Proposed Project:

SN	Particulars	Unit	Quantity	Rate Rs. (Thousands)	Total	Remarks
1	Community Mobilization and Capacity Building					
1.1	Formation and organization of farmer groups/cooperatives	times	100	20	2,000	
1.2	Farmers Field School training on commercial buffalo management, CSA, health, feeding and breeding	times	20	500	10,000	
2	Infrastructure Development for Buffalo Genetic Resource Centre (PPP model)	Number	1	10,000	10,000	
2.1	Construction of modern buffalo sheds	Number	5,000	2	10,000	
2.2	Shed modernization for smallholder farmers	Number	5,000	20	100,000	
2.3	Milk collection centres	Number	25	500	12,500	

3	Market Access					
3.1	Live buffalo business market (1,000 buffalo capacity)	Number	1	10,000	10,000	
3.2	Meat processing unit with slaughter slab	Number	1	10,000	10,000	
3.3	POP for buffalo calf fattening (meat)	times	1	10	10	
3.4	POP for buffalo calf rearing (milk/future breeding)	times	1	10	10	
3.5	Market linkage and cooperative partnerships	times	1	2,500	2,500	
4	Buffalo Productivity Enhancement					
4.1	Procurement of breeding bulls and proven semen	Number	200	100	20,000	
4.2	Procurement of seed buffaloes for nucleus herd	Number	50	100	5,000	
4.3	Buffalo Calf Rearing Program (milk & meat)	Number	500	100	5000	
4.4	Community AI / livestock breeding centres (ward level)	Number	50	200	10,000	
4.5	Animal identification, PPRS, progeny testing (AADGG)	times	3	200	600	
4.6	Infertility management and animal health campaigns	times	45	100	4,500	
4.7	AI technician and refresher training	times	3	400	1,200	
4.8	Farmer training on husbandry, CSA and biosecurity	times	5	200	1,000	
5	Animal Health Enhancement					

5.1	Zonation and compartmentalization (FMD/TADS)	times	1	1,500	1,500	
5.2	FMD and TADS vaccination and biosecurity	times	1	100	100	
5.3	Strategic parasite control	times	1	100	100	
5.4	Mastitis control program	times	1	100	100	
5.5	AMR and AMU management	times	1	100	100	
6	Feeds and Feeding					
6.1	Year-round fodder production	times	1	1,000	1,000	
6.2	Ration balancing program	times	1	4,000	4,000	
6.3	Nutritional fortification of agri-byproducts	times	1	200	200	
6.4	Silage, TMR and UMMB production	times	1	200	200	
7	Monitoring and Evaluation					
7.1	Productivity and household impact assessment	times	12	100	1,200	
Total					100000	

(NRS. 10 karod)

14. Project Activities Implementation Calendar (Gantt Chart):

SN	Particulars	Unit	Quantity	First F/Y	Second F/Y	Third F/Y
1	Community Mobilization and Capacity Building	Groups / Cooperatives				
1.1	Formation and organization of farmer groups/cooperatives to foster collaboration and knowledge sharing	times	100	✓		
1.2	Farmers Field School training and technology transfer including Climate Smart Agriculture (CSA), commercial buffalo management, health, feeding, breeding, and good husbandry practices	times	20	✓	✓	✓
2	Genetic Improvement and Breeding System Development					
2.1	Identification of elite buffaloes based on milk yield and performance	Number	5,000	✓	✓	
2.2	Establishment of 4–6 breeder herds and 20–25 multiplier herds; modernization of sheds for smallholder farmers	Number	5,000	✓	✓	✓
2.3	Development of local milk collection centres for shipment	Number	25		✓	
	Strengthening and systematic use of PPRS and integration of AADGG tools for digital recording, genetic evaluation, sire ranking, and genetic	—	—	✓	✓	✓

	progress monitoring					
3	Market Access					
3.1	Construction of live buffalo business market (animal welfare–friendly, 1,000 buffalo capacity)	Number	1		✓	
3.2	Establishment of meat processing unit (thermal treatment) with slaughter slab	Number	1			✓
3.3	Development of Package of Practices (POP) for buffalo calf fattening for meat production	times	1	✓		
3.4	Development of Package of Practices (POP) for buffalo calf rearing for milk production (future dam/sire)	times	1	✓		
3.5	Establish partnerships with cooperatives and markets for milk and meat marketing	times	1	✓	✓	✓
4	Buffalo Productivity Enhancement(Breed Improvement Program)					
4.1	Procurement of breeding bulls and proven semen for breed improvement	Number	200	✓	✓	
4.2	Procurement of seed buffaloes for nucleus herd / buffalo bull mother farm	Number	50		✓	
4.3	Establishment of Community Livestock Breeding / Artificial Insemination Centres at ward level	Number	50	✓	✓	

4.4	Animal identification and traceability, PPRS, and progeny testing	times	3	✓	✓	✓
4.5	Infertility management and door-to-door animal health campaigns	times	45	✓	✓	✓
4.6	Training and refresher training for artificial inseminators	times	3	✓	✓	✓
4.7	Farmer training on good husbandry, climate-smart livestock practices, and biosecurity	times	5	✓	✓	✓
5	Animal Health Enhancement					
5.1	Zonation and compartmentalization for FMD and TADS-free areas	times	1	✓		
5.2	FMD and other TADS control through vaccination and biosecurity	times	1	✓	✓	✓
5.3	Strategic internal and external parasite control	times	1	✓	✓	✓
5.4	Mastitis control program (surveillance, antibiotic sensitivity testing, teat dipping)	times	1	✓	✓	✓
5.5	Antimicrobial Resistance (AMR) and Antimicrobial Use (AMU) management	times	1	✓	✓	✓
6	Feeds and Feeding					
6.1	Year-round fodder production	times	1	✓	✓	
6.2	Ration balancing program	times	1	✓	✓	✓
6.3	Nutritional fortification of agricultural by-products	times	1	✓	✓	✓
6.4	Silage production, TMR, and	times	1	✓	✓	✓

	densified UMMB production and feeding practices					
7	Monitoring and Evaluation					
7.1	Regular assessment of buffalo productivity and economic impact on participating households	times	12	✓	✓	✓

15. Conclusion

The proposed program offers a practical, evidence-based pathway to unlock the genetic and economic potential of buffalo farming in Lumbini Province. With strategic investment over three years, the program will deliver lasting improvements in productivity, farmer income, and provincial contribution to national food security. The financial support from National Planning Commission will be instrumental in translating policy commitments into tangible results on the ground.