



# Climate-Smart Dairy Farming Project

## Nepal

### Factsheet for WFD session Smart Dialogue for Sustainable Livestock

*In 2023, Heifer International launched the Climate-Smart Dairy Farming Project. This short-term research project is funded by the AGCO Agricultural Foundation, and aims to reduce livestock methane emissions through feeding manipulation and carbon neutral dairy farming. They will achieve this by introducing fodder and promoting green energy. The Nepal Agricultural Research Council (NARC) and the International Livestock Research Institute (ILRI) are co-implementing partners. Based on the research, climate-smart dairy farming practices are being demonstrated in 100 smallholder dairy households in Sindhuli district. Larger scale dissemination will take place through training and extension material in other dairy pocket areas in Nepal.*

### **Climate-Smart Dairy Farming Project**

*Sustainability assessment at **regional level** (Bagmati and Koshi provinces)*

The Bagmati and Koshi provinces are situated in central and eastern Nepal. These agroecological regions, with its Inner Terai valleys and lower hills, mostly experience a sub-tropical climate with variable rainfall patterns – especially during the monsoon season. Dairy is one of the most important components of a mixed farming system in these regions, contributing to employment and income generation opportunities, ensuring food and nutrition security at household level, helping to maintain soil fertility and health, and contributing significantly to the national economy. It is estimated that about 4% of the total national GDP is contributed by the dairy sector. Despite the importance, the sector is also largely being blamed as the agent of environmental pollution emitting significant proportion of Greenhouse Gases (GHG). For the wellbeing for both the smallholder farmers and the environment, sustainable dairy farming is essential. The current project is embedded into a larger *Milky Way* program, which is implemented by Heifer International Nepal in collaboration with the government of Nepal. This project focuses on transforming the dairy sector at large, including creating an enabling environment.

**Soil health:** Dairy farming and soil health can be viewed from a symbiotic perspective. Dairy animals provide organic manure to maintain soil fertility, while fertile land provides a cheap source of forage to dairy animals. However, the **soil organic matter** content in the project areas is slowly declining, ranging from 1.2 to 4% decline in SOM per year (mean 2.8%). The soil is slightly acidic and sandy loam in nature. The Churia foothill area is prone to top **soil erosion** due to heavy rainfall during the monsoon season, its topography and soil nature. Gully erosion is prevalent in the area, which means there is heavy erosion and topsoil loss.

**Water management:** Water is one of the important production inputs for dairy farming. Water is needed for cattle to drink, to produce forage and water crops, and to clean dairy animal sheds. In general, **agricultural water availability** is insufficient during the winter and dry summer months, which critically hampers forage production in winter. Also, farmers face challenges regarding the availability of green forage during dry summer months (March–May). In addition, there are some issues with the **water quality** mainly due to ignorance of farmers, negatively impacting the dairy animals. Particularly in Sindhuli, there is no ground water source due to the topography and nature of the soil, and the surface water (i.e. streams/ rivers) is minimal during winter months.

**Resource use & environmental impact:** Stall feeding is most prevalent for dairy farms rearing crossbred/ improved breeds in the area.

Dependencies on natural resources for dairy animals is gradually declining.

**Manure management** is a great problem. Farmers generally spread manure and urine in nearby areas openly, potentially adding methane in the environment and urine nitrogen/ nitrous oxide in the water source. FAO's estimates of **GHG emissions** per kg of milk production in Nepal and South Asia region is high (i.e. between 4.25–7kg CO<sub>2</sub> eq/kg FPCM). To minimize the impact of dairy farming on the environment some **renewable energy** is produced through biogas production from animal manure. Emphasis is also placed on fodder plantation for carbon sequestration while providing nutritious feed for the dairy animals.

**Animal care:** Another way to reduce the negative environmental impact of dairy farming is to promote climate-smart dairy husbandry practices and preventive measures (such as vaccination coverage against prevalent diseases). Although the majority of the herds are vaccinated and receive proper **animal health** care, the rest of the herds remain in poor health, and are vulnerable to emerging pandemics like lumpy skin diseases. In terms of **animal welfare**, while farmers care for the animals' health and ensure access to good feed and water, the animals still face challenges such as heat stress, occasional feed shortages, and variations in drinking water quality.

**Access to production factors:**

Although the government has policies in place to increase **access to credit** for smallholder farmers, accessing credit remains difficult for most. Financial institutions are not comfortable with providing credits to smallholder farmers due to high operational costs. There is also a shortfall in **feed availability**, combined with quality issues. Among high prices, farmers cannot trust feed sold by the private sector. Since year-round adequate forage is not easily available, dairy farming has become costly and less competitive.

**Profitability:** High input and service costs combined with the low dairy cattle productivity causes high production cost and low profitability, thereby reducing **farmer's gross income**. This makes the dairy farming business less lucrative and leads to higher turnover rates. It is estimated that farmgate prices are between 35–50% of retail prices and thus offer farmers a fair share of the value added in the chain.

**Access to markets & services:** Market channels/actors are available for farmers to sell their animal products, but there are limitations because Nepal's dairy sector is greatly influenced by international dynamics. The international price for Skimmed Milk Powder (SMP) largely fluctuates. When prices go down, the processing industries will import SMP to sell in the domestic market with greater profit margin. Yet, when international SMP prices go up, the processing industry demands more milk from the farmers. This uncertainty of **access to output markets** is a threat to the dairy sector's sustainability.