



National Dairy Development
Board

Environment and Social Assessment for National Dairy Support Project Phase-II

Final

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Environment and Social Assessment for National Dairy Support Project Phase-II (NDSP-II)

Final

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Abbreviations

| | |
|------|----------------------------------|
| AMCS | Automatic Milk Collection System |
| BMC | Bulk Milk Cooler |

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| ADU | Adult cattle unit |
| CPSC | Central Project Steering Committee |
| DAHD | Department of Animal Husbandry and Dairying |
| DCS | Dairy Cooperative Societies |
| DG | diesel generator |
| DMUs | District Milk Unions |
| DPR | Detailed project report |
| E&S | Environment and Social |
| ESA | Environment and Social Assessment |
| ESCP | Environmental-and-Social-Commitment-Plan |
| ESF | Environment and Social Framework |
| ESMF | Environmental and Social Management Framework |
| ESS | Environment and Social Standard |
| EVM | Ethnoveterinary medicine |
| FGD | Focused group discussion |
| FPO | Farmer Producer Organization |
| FSMS | Food Safety Management System |
| FSSAI | Food Safety and Standards Authority of India |
| GBV | Gender based violence |
| GHG | Green House Gas |
| GRM | Grievance Redress Mechanism |
| GRO | Grievance Redressal Officer |
| IBRD | International Bank for Reconstruction and Development |
| ICAR | Indian Council of Agricultural research |
| ICT | Information and Communication Technologies |
| IEC | Information, education and communication material |
| IFC | International Finance Corporation |
| IP | Indigenous people |
| IPPF | Indigenous People Policy Framework |
| KLD | Kilo litres per day |
| KPIs | Key Performance Indicators |
| KVK | Krishi Vigyan Kendras |
| LEO | Lady Extension Officer |
| M&E | Monitoring & Evaluation |
| MIS | Management Information Systems |
| MMT | Million metric tonnes |
| MPP | Milk Pooling Points |
| NDDB | National Dairy Development Board |
| NDP | National Dairy Plan |
| NDSP | National Dairy Support Project |
| NGO | Non-government organisation |
| PC | Producer Company |
| PFC | Project Facilitation Cell |
| PMU | Project Management Unit |
| POI | Producers' Owned Institutions |
| PSC | Project Sanctioning Committee |
| RFCTLARR | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013 |
| RPF | Resettlement Policy Framework |
| SC/ST | Scheduled Castes/Scheduled Tribes |
| SE | Stakeholder Engagement |
| SEA/SH | Sexual Exploitation Abuse/Sexual Harassment |
| SEP | Stakeholder Engagement Plan |

| | |
|-------|--|
| SHGs | Self Help Groups |
| SLTMC | State Level Technical Management Committee |
| SPPs | Sub-project plans |
| SPV | Solar Photovoltaic |
| TMR | Total Mixed Ration |
| TSS | Thermal Storage System |
| VBMPs | Village Based Milk Procurement Systems |
| WB | World Bank |

1. INTRODUCTION

1.1 Project Background

National Dairy Development Board (hereinafter referred to as 'NDDB' or 'the Client') has engaged ERM India Private Limited (hereinafter referred to as ERM) to undertake consulting services for Environment and Social Assessment (ESA) for preparation of Environment and Social Management Instruments for the National Dairy Support Project Phase II (hereinafter also referred to as NDSP-II). The scope of work and schedule for the ESA have been mutually agreed upon by ERM and the Client as per the contract signed on October 12, 2022.

With milk production of 221 Million Metric Tonnes during the year 2021-22, the country showed remarkable progress in terms of overall growth in milk production and procurement by POIs (586 Lakh Kg per day during 2022-23), there still are inter and intra – regional variations in growth. The factors underlying regional imbalances in the growth of milk production can be attributed to low productivity of milch animals due to slow genetic progress in the breedable bovine population, differences in resources in relation to feed and fodder, lack of animal health (AH) services, weak input service delivery system, and lack of market access. Dairy farmers are facing challenges such as low milk prices, high feed costs, and labour shortages, whereas producers' owned institutions (POIs) are facing challenges of changing consumer needs, increased regulation, competition in the market, and volatile weather.

A combination of improved feeding strategies, better health management, better manure management, and improved cow genetics can create a more resilient dairy by reducing greenhouse gas emissions while increasing milk production with optimised feed. Supported by the right level of automation and adoption of contemporary technologies, dairy farmers can improve performance and overall efficiency. POIs can improve their performance by procuring quality milk transparently from their producer members, efficiently processing of milk into milk products following recommended food safety & quality standards, developing a robust forward market linkage with a strong network of cold chain infrastructure and improved brand building & sales promotion strategy. The overall business operation of the POIs can be integrated with information and communication technologies (ICT) based system for delivering an efficient business operation.

To address the above, National Dairy Development Board (NDDB) has successfully implemented NDP-I which ended in 2019-20 and results are encouraging in terms of improving productivity of animals and thereby sustaining the momentum in growth in country's milk production. To sustain the growth in milk production, increasing coverage of dairy cooperative entities and ensuring quality and safe milk to consumers, NDDB has proposed NDSP-II Project under credit line of the International Bank for Reconstruction and Development (IBRD). Under the Project, various interventions are envisaged which will help in addressing various challenges faced by dairy farmers and POIs. The Project will be implemented primarily in six Indian states including Jharkhand, Odisha, Madhya Pradesh, Himachal Pradesh, Sikkim and Uttarakhand. The pilot activities envisaged in the NDSP-II Project may be located within or outside the identified Indian states. The programme is proposed to be implemented for a period of 5 years.

To ensure a systematic examination environmental and social risks and impacts, and issues, associated with a policy, plan or program, both at the national level, and smaller areas, this Environmental and Social Management Framework (ESMF) has been developed with the following objectives and reference framework.

1.2 ESMF Objectives

The objective of the ESMF is to define a mechanism for integrating environmental and social concerns into the implementation of NDSP-II. The ESMF thus not only define process for planning and implementing the environmental and social measures in subprojects but also provide guidance to the planning and designing of subprojects across the selected states to avoid or minimize environmental and social adverse (negative) impacts and also enhance positive impacts, while supporting

development of inclusive and competitive milk value chain, focusing on smallholder livestock rearers and producer-owned institutions in the selected states through following key result areas:

- Increase in the share of milk sold to the organized sector,
- Increase in milk processing capacity under quality assessment systems
- Project beneficiaries adopting climate-smart practices
- Reduction in methane emissions per liter of milk

1.3 Applicable Reference Framework

The applicable reference framework for development of ESMF covered the following:

- a) Environmental and Social Standards (ESS) of World Bank,
- b) Environmental-and-Social-Commitment-Plan (ESCP) of World Bank,
- c) Stakeholder Engagement Plan and Stakeholder Engagement Framework of World Bank,
- d) The World Bank Environmental and Social Framework (ESF) Implementation document.
- e) Strategic Environment and Social Assessment for NDSP (NDP-I),
- f) Applicable Acts and Rules including of Ministry of Environment, Forest, and Climate Change.

1.4 Scope of the ESA including ESMF

The Scope of Work under the preparation of ESA including ESMF is to provide sufficient guidance to the Project implementation agencies, line departments and other stakeholders in identification, selection, preparation, implementation, and operation of the overall Project to:

- avoid or minimize environmental and social (E&S) risks and negative impacts, and,
- enhance opportunities to strengthen environmental and social performance and thereby, help in achieving intended project outcomes

The broad scope of work is as following:

- a. Conduct, as the first step a comprehensive Environment and Social Screening of the project activities to determine key risks, potential impacts/issues and scoping for E&S studies/ instruments.
- b. Prepare an ESMF by analyzing the baseline of the selected spatial area; identifying and assessing potential environmental and social impacts and risks; analysing key national and state legal requirements, relevant to project planning and implementation; preparing a scheme cycle for E&S management (covering planning, implementation, and post-implementation phase) and propose effective arrangements for the multiple implementing agencies under the project to develop their capacity to manage E&S due diligence processes (reporting and monitoring mechanisms)
- c. Prepare Stakeholder engagement plan (SEP) and Climate Change & Resource Efficiency Strategy for the overall project in accordance with the Bank's ESF as instruments for risk management and facilitate disclosure of these instruments/ documents before project appraisal.
- d. Develop Comprehensive Capacity Building Plan for project implementing agencies and other relevant stakeholder (including NDDDB) to bridge specific capacity gaps on various E&S issues where there is deficit or unfamiliarity (based on initial assessment).
- e. Develop environmental and social monitoring indicators and systems for monitoring and reporting on ESMF performance.
- f. Propose thematic study, if any, required to be conducted in the context of project and E&S framework of the World Bank.

1.5 Limitations

Absence of reliable and village/block/district/state-level datasets on many dairy issues such as environmental resource consumption (water, feed, grazing area required, wastes etc.); animal health-human health; livelihoods dependent on dairying as stand-alone and coupled with farming and other livestock rearing (integrated).

2. APPROACH AND METHODOLOGY

2.1 Approach of the Study

As per the guiding principles of the ESMF, all projects funded by the IBRD require the borrowers to – (a) achieve compliance with all applicable national, state, and local laws and regulations related to environmental and social matters; and (b) meet the requirements of the World Bank Group ESSs as outlined in the ESF. This ESMF is the key E&S risk management tool used by borrowers to identify, assess, mitigate and report on project E&S risks, impacts, and mitigation measures and the effectiveness of their implementation. It covers:

- Integration of environmental and social aspects into the decision-making process at all stages of the entire NDSP-II Project and all its sub-projects; including planning, design, implementation of sub-projects by identifying, avoiding, and/or minimizing adverse environmental and social impacts early-on in the Project cycle,
- Enhancement of positive/sustainable environmental and social outcomes through sensitive planning, design, and implementation of sub-projects,
- Avoidance or minimization of risks and impacts on cultural properties and natural habitats and/or other direct/indirect impacts through careful planning and environmental and social mitigation measures, and
- Ongoing consultations with stakeholders are ensured throughout the Project's lifecycle, the relevant outcomes of which will inform the Project design, activities, assessments, and implementation of mitigation measures.

This ESMF describes the existing environmental and social sensitivities, potential risks and impacts due to Project, and sub-projects under NDSP-II by suggesting improvements to existing systems, and interventions for better environmental and social outcomes of proposed facilities, and mitigation hierarchy, and monitoring arrangements. Long-term risks and impacts are avoided through exclusions and screening. As per World Bank Policies, ESMF applies to the entire NDSP-II Project; also, to linked activities or associated facilities. All sub-projects and linked/associated facilities shall also be categorized, impacts identified and implementation of mitigation measures, and monitoring planned and implemented.

2.2 Methodology for the Study

2.2.1 Project Inception – Kick-off Meeting

The Project was started with a Kick off call with National Dairy Development Board (NDDB) and the World Bank (WB) on October 21, 2022. The kickoff meeting covered discussion on the Project understanding, study approach and methodology, data requirement and Project schedule, etc.

2.2.2 Reconnaissance Surveys and Baseline Data Collected

ERM team undertook site reconnaissance visits in all five states from December 5 to 15, 2022. The purpose of the reconnaissance site visits was to meet and discuss with various stakeholders to finalize the villages for survey. ERM engaged M/s J.S. Infrastructure Consultants Pvt. Ltd. as a subcontractor to conduct household surveys, consumer surveys, and retailer surveys in the selected five states. The agency carried out the primary survey from the 3rd week of December 2022 to the 2nd week of January 2023.

2.2.3 Literature Review

A review of key documents was undertaken to understand the Project scope and settings, which include review of project DPR, applicable Acts, Regulations, Policy and programs, IFC-WB guidelines on dairy

sector, livestock census, report, population census report, and other relevant reports and documents related to dairy sector.

2.2.4 Formulating Strategy for Conducting Study

2.2.4.1 Selection of Districts

As defined in the scope of work, ERM team conducted visit to three (3) districts from each five selected state of Odisha, Madhya Pradesh, Jharkhand, Himachal Pradesh, and Uttarakhand. The district selection was undertaken by considering the following sets of criteria:

- Presence of Dairy Cooperatives and Milk Unions (by reviewing NDDDB provided data),
- Milk Procurement (by reviewing NDDDB provided data)
- Cattle and buffalo population (by reviewing 20th Livestock Census 2019 provided data),
- Number of indigenous people (by reviewing Census of 2011).

Based on above mentioned criteria three districts from each of the above-mentioned five states of India were selected to assess strategy for ESMF development. Refer to **Table 2.1** and in **Appendix A** for details of the districts in the five states of India (all combined hereinafter referred to as the project area).

2.2.4.2 Selection of Urban Centers

For the study, three districts were selected from each of the five states. In each of the selected districts, 10 villages and two urban centers were selected for detailed investigation considering nearest town and district headquarters from the selected villages and urban centers. Based on the above-mentioned criteria, following urban centers were selected (Refer to **Table 2.1**).

Table 2.1: Selected Districts and Urban Centres

| State | District | Urban Centre 1 (District Headquarter) | Urban Centre 2 |
|------------------|-------------------|--|--|
| Himachal Pradesh | Mandi | Mandi | The nearest town to the ten selected villages of the district were considered as Urban Centre 2. |
| | Kangra | Dharamshala | |
| | Shimla | Shimla | |
| Uttarakhand | Haridwar | Roshnabad | |
| | Udham Singh Nagar | Rudrapur | |
| | Dehradun | Dehradun | |
| Madhya Pradesh | Bhopal | Bhopal | |
| | Shajapur | Shajapur | |
| | Sagar | Sagar | |
| Jharkhand | Garhwa | Garhwa City | |
| | Palamu | Daltonganj | |
| | Latehar | Latehar Town | |
| Odisha | Baleswar | Balasore | |
| | Cuttack | Cuttack | |
| | Bhadrak | Bhadrak | |

2.2.4.3 Selection of Villages

The selection criteria for shortlisting of villages from each of the three districts in five states were based on presence of indigenous population, women in dairying, Producer Owned Institutions (POIs), cattle and buffalo population at the village level, dairying related infrastructure and so on. Finally, 10 villages

were selected in consultation with NDDB and district level dairy supply chain stakeholders were identified from for each of the selected districts.

2.2.4.4 Selection of Households

Households for survey from selected villages were shortlisted to capture the families engaged in dairying, or prospective beneficiaries, based on house listing with the local community. Households' shortlisting was based on the following indicative criteria:

- Families having milch animals and engaged in dairying,
- Tribal and vulnerable population in the villages,
- Family income - above poverty line APL/ below poverty line BPL,
- Women headed households, and
- Small, medium, large milking cattle -holding size.

The selection of households was carried out in a purposive way to ensure adequate representation from all socio-economic communities/categories of farmers present in the village.

2.2.5 Survey Tools

The survey tools for the study were prepared on survey questionnaire (to cover households, consumer, retailers/distributors), focus group discussions (FGD) and consultation (at village, districts, state level). The list of stakeholder has been presented in **Appendix B**.

2.2.6 Field Surveys

A team of trained field investigators of M/s JS Infrastructure Consultants Pvt. Ltd. were engaged for each of the five states who were conversant with the local language and traditions with strong survey experience to suitably capture the issues related to the dairy sector through the survey. Aside from the issues that needed to be captured in the field, the field investigators were given proper training on the survey instruments. This ensured that there was consistency in approach and methodology among the investigators covering the five states. Each state was supervised by ERM staff responsible for quality control and stakeholder consultations.

2.2.7 Environment and Social Management Framework

The ESMF has been prepared to address the following:

- Preparation of Indigenous People Policy Framework (IPPF): This includes strategies to help tribal, women and other vulnerable sections who are actively involved in decision making so that they access Project benefits at par with others.
- Preparation of Resettlement Policy Framework (RPF): This includes measures required to support potential land requirement for the sub-projects.
- Preparation of Project-level Occupational and Community Health Strategy: This includes recommendations to sensitize, make aware and train workers and people on these risks and suggest specific mitigation actions to reduce identified risks.

Preparation of Project-level Climate Change and Resource Efficiency Action Plan: This includes (i) identify opportunities to reduce GHG emissions from dairying, (ii) identify opportunities to improve the resource-use efficiency in dairying, particularly the water and energy use footprint of the dairying sector and (iii) identify opportunities to promote alternative energy saving devices, including solar, biogas, air-conditioning, energy efficiency lighting etc.

3. PROJECT DESCRIPTION

3.1 Introduction

Considering the challenges faced by Producers' Owned Institutions (POIs) and dairy farmers, the project envisages a multi-pronged strategy to improve the institutional capacity of the POIs for effectively managing their business operations. The project will also help strengthening their dairy supply chain, sales, and marketing system, improving the quality of milk and milk products through certification and awareness generation, improving the productivity of animals through scientific feeding practices, adopting ethno-veterinary medicine for animal treatment. The project will also help in promoting and increasing resilient dairying practices by adopting renewable sources of energy, developing the manure value chain, and managing GHG emissions. These activities would be supported by interventions in the areas of extension, awareness generation, training, and capacity building, and strengthening of the information and communication technologies (ICT) infrastructure of POI.

3.2 Project Objectives

"To support the development of an inclusive and competitive milk value chain, focusing on smallholder milk producers and Producers' Owned Institutions (POIs) in the selected villages and urban centers from five states i.e., Odisha, Madhya Pradesh, Jharkhand, Himachal Pradesh, and Uttarakhand with a focus mainly to cover the following components:

- A. Enhancing Institutional Capacity and Sustainability,
- B. Strengthening Dairy Market Development,
- C. Productivity Improvement and Enhancing Climate Resilience, and
- D. Project Management and Learning.

3.3 Project Components

3.3.1 Component A: Enhancing Institutional Capacity and Sustainability

The focus of Component A is to enhance institutional capacity development, extension and awareness generation, and resource allocation based on the gap assessment for effective implementation and monitoring of sub projects by POIs. This will help in long-term sustainability with improved performance of the POI.

3.3.2 Component B: Strengthening Dairy Market Development

POIs in the project area procure about 2.5% of the milk produced through village level institutions. In the project area, there are 1.76 lakh revenue villages of which about 60,000 are dairy potential villages. As on March 2021, POIs have about 15,695 Functional dairy cooperating societies (DCS) and milk pooling points (MPP). Thus, there is need to support dairy cooperatives by strengthening milk procurement infrastructure at village level, so that, milk producers get access to the organized milk market and get better value of their sold to the dairy cooperatives.

Success of Village Based Milk Procurement Systems (VBMPs) component implemented under NDP-1 was widely acknowledged, not only in terms of achievement on physical parameters of milk procurement and milk producers but on social parameters as improved women membership, participation of small holder members as well. The components taken up under VBMPs such as providing support for organization of DCS/MPP, setting up of electronic milk testing equipment and creating village level milk chilling infrastructure has certainly helped uncovered milk producers to join the next milk revolution.

To strengthen the milk procurement system at village level and provide market access to the milk producers, installation of Automatic Milk Collection Unit (AMCU)/ Data Processor and Milk Collection

Unit (DPMCU) will put in place a fair and transparent milk procurement system. Further, installation of Bulk Milk Coolers (BMC) along with Milk Adulteration Testing equipment at village level will result in improvement of milk quality at village level.

3.3.3 Component C: Productivity Improvement and Enhancing Climate Resilience

Dairy farming and farmers need to adapt to changing conditions not only at an economic, but also at an environmental, socio-cultural and consumer level. Building resilience at the cow, farm and sector level will be important for future-proofing this important and evolving dairy sector.

Dairy farmers are facing challenges such as low milk prices, high feed costs, labour shortages, and POIs are facing challenges in changing consumer needs, increased regulations, and volatile weather. Farmers/POIs must balance these with an aim to enhance income, without which they are unable to sustain their business income in long run.

A combination of improved feeding strategies, better health management, better manure management and improved cow genetics can create a more resilient dairy industry, by reducing greenhouse gas emissions, while increasing milk production with optimized feed.

Under the Component various interventions are envisaged which will help in addressing various challenges related to milk productivity and climate resilience in dairy sector.

3.3.4 Component D: Project Management and Learning

Project Management and Learning (PM&L) activities under the project will put in place a robust monitoring and evaluation system which will provide opportunities for learning and sharing good practices both in the project area nationally and internationally.

All the components/ sub-component activities envisaged under the project will be constantly monitored. It is expected that large scale data will be generated during implementation of the projects. Such data will be suitably collated, compiled, analyzed, monitored, and evaluated to assess the progress of the project, in identifying scope for further improvement and to provide feedback to the POIs on course correction.

The activities of PM&L include:

- i. Establishment, operation, and management of computerized MIS at NDDDB and POIs level to capture data and generate reports on performance, including output/ outcome indicators,
- ii. Services of external agencies for carrying out baseline, mid-term, annual and project completion surveys and other special surveys/studies (including thematic studies) as may be needed during the Project implementation,
- iii. Third-party quality assurance of civil works under the Project, and
- iv. Support for Project co-ordination and monitoring.

3.4 Project Location and Beneficiaries

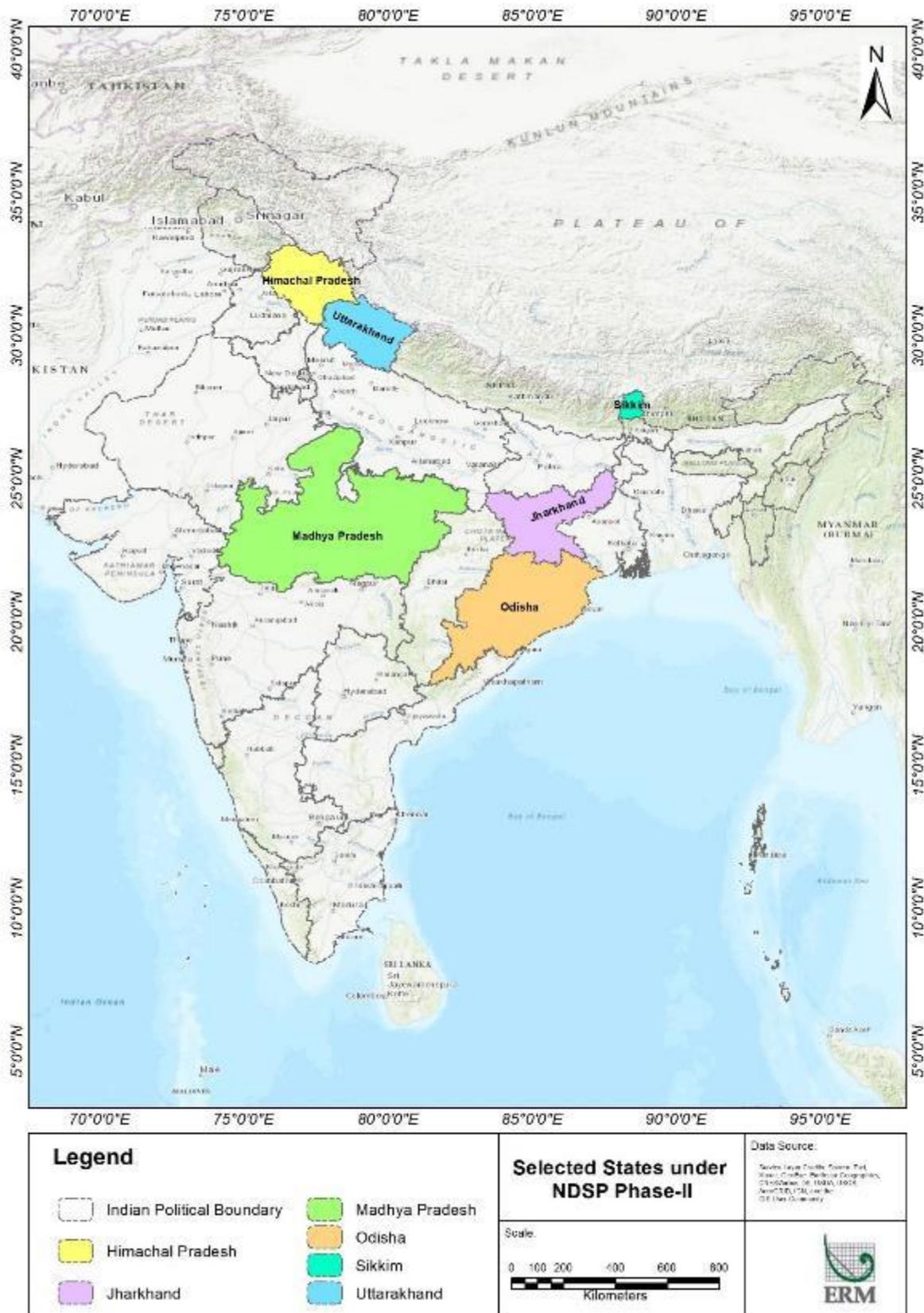
The Project will be implemented in six states, namely – Odisha, Madhya Pradesh, Jharkhand, Himachal Pradesh, Sikkim, and Uttarakhand (Refer to **Figure 3.1**). The ultimate beneficiaries of the Project are POIs, who shall be State Milk Federation, Milk Unions, Multistate Cooperatives, Farmer Producers Organizations (FPOs) and Milk Producers' Organizations formed by self-help groups (SHGs).

The Project will support households to primarily increase their marketable access by setting up of village level producers' institutions and enhance their milk productivity through ration advisory services, feeding of Total Mixed Ration, scientifically rearing of their calves, feeding of green/ dry fodder and silage, and mastitis control using Ethno Veterinary Medicines (EVM). This will result in increase in income of milk producers from dairying activities. The household level Biogas plant will provide dual benefit to milk

producers by saving their cooking fuel cost and use of the slurry /manure in their agricultural field for crop production. Support to provide Solar system at village level producers institution level will help in saving the electricity cost which will be indirectly passed on to the milk producer members in the form of better value for their milk.

The POIs will be benefited from this Project through institutional development activities, where capacity building of existing manpower, resource allocation for efficient execution of various activities envisaged under the project and integrated ICT system will be supported. In addition, to improve the quality and safety of milk and milk products, POIs will be supported with food safety management system programme and required infrastructure. Further, support will be provided to POIs to improve their market share by enhancing their sales of packed milk and milk products through improved marketing cold chain/distribution system, retailer/consumer awareness, brand building and sales promotion. The POI and village level producers' institution will help in improving their profitability which will in turn be passed on to the milk producers members enhancing their income from dairying.

Figure 3.1 Selected States under the NDSP II Project



4. POLICY AND REGULATORY FRAMEWORK

This section presents the environmental and social policies and regulatory framework applicable for this Project. The review attempts to bring together Country's environmental and social policies, regulations, and World Bank policies that could be relevant for the implementation of NDSP-II.

4.1 World Bank Environmental and Social framework (ESF)

The World Bank environmental and social framework (ESF) offers a broader and more systematic coverage of environmental and social risks. The ESF also requires attention to environmental and social issues throughout the preparation and implementation of a project, with increased focus on stakeholder engagement and monitoring. It clarifies roles and responsibilities between the World Bank and its Borrowers. The ESF sets out a risk management approach tailored to risks and impacts of projects. The ESF sets out 10 Environmental and Social Standards (ESS), which are applicable to borrowers.

Based on the review of component and sub-component the following World Bank ESS are found to be applicable to the Project, same is presented in **Table 4.1**.

4.2 Environment and Social Regulation Framework

India has strong set of laws and regulations both on environmental and social aspects. Progressive changes in regulations covering many social and environmental aspects have been made in the recent decades. A brief analysis of the local laws and regulations and their applicability to NDSP-II is presented in **Table 4.2**.

Table 4-1: Applicable World Bank’s ESS to NDSP-II

| S. No. | Components & Subcomponents | Applicable ESS | Applicability |
|------------|---|---|--|
| A. | Component A: Enhancing Institutional Capacity and Sustainability | | |
| A.1 | Institutional capacity building | | |
| A.1.1 | Dairy Cooperative Society (DCS) level capacity building | ESS 7: Indigenous People | The newly formed Dairy Cooperative Society (DCS) may fall in states with presence of indigenous community. The participation of indigenous people shall be encouraged in the DCS to comply with national regulations as well as to foster the livelihood of local communities. |
| | | ESS 10: Stakeholder Engagement and Information Disclosure | DCS is an important stakeholder of the dairy supply chain. At DCS/milk union multiple groups are interacting at same platform with each other on specific problems, bottlenecks, suggestions, recommendations etc. Strengthening or formation of new DCS will require the community acceptance and participation. A proper stakeholder engagement plan (SEP) together with grievance redressal mechanism (GRM) and information disclosure are required for smooth functioning of the DCS at village level. |
| A.1.2 | Milk Union Level capacity building | ESS 7: Indigenous People | The participation of indigenous people shall be encouraged in the milk union level capacity building program to comply with national regulations as well as to foster the livelihood of local communities. |
| | | ESS 10: Stakeholder Engagement and Information Disclosure | A proper stakeholder engagement plan (SEP) together with grievance redressal mechanism (GRM) and information disclosure are required for this sub-component. |
| A. 1.3 | Farmer level capacity building | ESS 7: Indigenous People | The participation of indigenous people shall be encouraged for this sub-components. |
| | | ESS 10: Stakeholder Engagement and Information Disclosure | Number of women are involved in the dairy sector. An SEP is required for women stakeholders to listen and assess their problems and suggest solutions to make them involve more in the dairy activities based on their willingness |
| A.2 | Human Resource Development | | |
| A.2.1 | Deployment of Lady Extension Officer (LEO) | ESS 7 - Indigenous People | The participation of indigenous people shall be encouraged for this sub-component. |
| A.3 | Adoption of Technology | | |
| A.3.1 | Strengthening of Training Centres | ESS 10: Stakeholder Engagement and Information Disclosure | Refer to A.1.2 |

| S. No. | Components & Subcomponents | Applicable ESS | Applicability |
|--------|---|---|--|
| B. | Component B: Strengthening Dairy Market Development | | |
| B.1 | Strengthening the dairy Supply Chain System | | |
| B.1.1 | Expansion of village coverage | ESS 7 - Indigenous People | The participation of indigenous people shall be encouraged for this sub-component. |
| | | ESS 10 - Stakeholder Engagement and Information Disclosure | A proper stakeholder engagement plan (SEP) together with grievance redressal mechanism (GRM) and information disclosure are required for this sub-component. |
| B.1.2 | Strengthening village level milk chilling infrastructures | ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts | Establishment of bulk milk coolers (BMC) to strengthen the village level dairy supply chain. This may involve environmental and social risks/ impacts based on the volume of milk handling and pollution related impact. The potential environmental impact must be assessed, and a plan must be developed and implemented. |
| B.1.3 | Provision of village level milk testing equipment | ESS 4- Community Health, Safety and Security | Appropriate milk testing arrangements can ensure the community's health-related impacts through the quality of milk |
| B.1.4 | Milk Adulterant and testing equipment at BMC Level | ESS 4- Community Health, Safety and Security | Refer to B.1.3 |
| B.1.5 | Community Milking Centres | ESS 1 - Assessment and Management of Environmental Risks and Impacts | The establishment of community milking centres will require environmental pollution control from organic waste generated consisting of cattle dung, feed residue and domestic hazardous wastes consisting of vaccines, vials, medicines, syringes, etc. The potential environmental impact must be assessed, and a plan must be developed and implemented. |
| | | ESS 4 Community Health, Safety and Security | Agglomeration of cattle from different households may result in the spread of any communicable or vector-borne disease affecting the bovine or human population. The facility needs to prepare a community health and safety management plan and implement it. |
| | | World Bank Group EHS Guidelines for Dairy Processing | The discharge standards for dairy processing effluents to comply with the requirements of state pollution control prescribed standards and EHS guidelines and. The facility needs to meet the discharge standard. |
| B.1.6 | Milk Tanker based milk measurement and sampling system | ESS 4- Community Health, Safety and Security | Refer to B.1.3 |

| S. No. | Components & Subcomponents | Applicable ESS | Applicability |
|------------|--|---|---|
| B.1.7 | Installation of AMCS solution at DCS/MPP | ESS 4- Community Health, Safety and Security | Refer to B.1.3 |
| B.1.8 | Village level Milk Pasteurization and Product Manufacturing | ESS 3 - Resource Efficiency and Pollution Prevention | Water and power would be required during the construction and operational phases of the plant. Pollution control mitigation measures and a resource conservation plan need to be prepared, and the same need to be implemented. |
| | | World Bank Group EHS Guidelines for Dairy Processing | Covers EHS guidelines and discharge standards for dairy processing effluents. |
| B.1.9 | Clean Milk Production (CMP) programme for milk producer members | ESS 4- Community Health, Safety and Security | Refer to B.1.3 |
| B.2 | Strengthening the Sales and Marketing System | | |
| B.2.1 | Provision of Visi-cooler, Chest coolers, Deep freezers, Instant Ice cream making units/ Softy Machines and Insulated crates in key outlets/ booths. | ESS 3 - Resource Efficiency and Pollution Prevention | Power would be required during the operational phases of the facility. Energy conservation measures need to be prepared and implemented. |
| B.2.2 | Installation of booths/ parlours/ kiosks on Government land/ institution premises given to them on a long-term lease for free or against nominal rent; | ESS 3 - Resource Efficiency and Pollution Prevention | Refer to B.2.1 |
| B.2.3 | Recruitment of sales professionals to spearhead all sales & marketing activities of EIAs; | ESS 7 - Indigenous People | The participation of indigenous people shall be encouraged for this sub-component. |
| | | ESS 10- Stakeholder Engagement and Information Disclosure | A proper stakeholder engagement plan (SEP) together with grievance redressal mechanism (GRM) and information disclosure are required for this sub-component. |
| B.3 | Enhancing Food Safety and Quality | | |
| B.3.1 | Milk quality Improvement Programme | ESS 4- Community Health, Safety and Security | Refer to B.1.3 |

| S. No. | Components & Subcomponents | Applicable ESS | Applicability |
|--------|--|---|--|
| B.3.2 | Dairy Plant Improvement Programme | ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts | Dairy Plant Improvement Programme may require environmental pollution control for the modernisation/ expansion activities. Dairy plant needs to carry out appropriate environmental and social assessment of subprojects and prepare and implement mitigation measures. |
| | | ESS 2: Labour and Working Conditions | Construction and operation will involve workers engaged in this sub-project. The construction labour management plan must be developed and implemented by the plant. |
| | | ESS 3: Resource Efficiency and Pollution Prevention | Water and power would be required during the construction and operational phases of the plant. Pollution control mitigation measures and a resource conservation plan need to be prepared, and the same need to be implemented. Construction and renovation work may have a potential impact on air, noise, and soil quality; appropriate mitigation measures need to be implemented. |
| | | ESS 4 Community Health, Safety and Security | Improper waste management at dairy plant may result in the spread of any communicable or vector-borne disease affecting the bovine or human population. The facility needs to prepare a community health and safety management plan and implement it. |
| B.3.3 | Introduction/up-gradation of Food Safety Management System (FSMS) (ISO 22000/ FSSC 22000 and/or Quality Mark/ CAS MMP) | ESS 4 Community Health, Safety and Security | Refer to B.2.1 |
| B.4 | Strengthening dairy business operations through ICT support | ESS 10- Stakeholder Engagement and Information Disclosure | Refer to B.2.3 |
| C. | Component C: Productivity Improvement and Enhancing Resilient Rearing Practices | | |
| C.1 | Promotion of Scientific Feeding Practices | | |
| C.1.1 | Ration Advisory Services | ESS 7 - Indigenous People | Refer A.1.1 |
| C.1.2 | Calf Rearing Programme (CRP) for buffalo & cow calves | ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts | CRP requires environmental pollution control. The unit need to carry out appropriate environmental and social assessment of subprojects and prepare and implement mitigation measures. |

| S. No. | Components & Subcomponents | Applicable ESS | Applicability |
|--------|--|---|---|
| | | ESS 2: Labour and Working Conditions | Construction and operation will involve workers engaged in this sub-project. The construction labour management plan must be developed and implemented by the plant. |
| | | ESS 3: Resource Efficiency and Pollution Prevention | Water and power would be required during the construction and operational phases of the plant. Pollution control mitigation measures and a resource conservation plan need to be prepared, and the same need to be implemented. |
| | | ESS 4 Community Health, Safety and Security | Improper waste management at CRP may result in the spread of any communicable or vector-borne disease affecting the bovine or human population. The facility needs to prepare a community health and safety management plan and implement it. |
| C.1.3 | Village level producers' institutions based TMR Plant | ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts | Refer to C.1.2 |
| | | ESS 2: Labour and Working Conditions | Refer to C.1.2 |
| | | ESS 3: Resource Efficiency and Pollution Prevention | Refer to C.1.2 |
| | | ESS 5- Land Acquisition and Involuntary Resettlement | Land procurement may be required for the proposed sub-component. The procurement of land should be as per ESS-5 provision. |
| C.2 | Demonstration of Fodder Production & Conservation Technology | | |
| C.2.1 | Setting up of Fodder Seed Processing Plant | ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts | CRP may applicable environmental pollution from the Fodder Seed Processing Plant. The unit need to carry out appropriate environmental and social assessment of subprojects and prepare and implement mitigation measures. |
| | | ESS 2: Labour and Working Conditions | Construction and operation will involve workers engaged in this sub-project. The construction labour management plan must be developed and implemented by the plant. |
| C.2.2 | Demonstration of Green Fodder Conservation Technologies | ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources | Setting up of Fodder Seed Processing Plant in modified habitat (waste land/ scrub land) may have impact on natural/ modified terrestrial habitat and ecological services. Biodiversity conservation plan shall be prepared and implemented, |

| S. No. | Components & Subcomponents | Applicable ESS | Applicability |
|------------|---|---|---|
| C.2.3 | Demonstration of community level green fodder production | ESS 3: Resource Efficiency and Pollution Prevention | Water would be required for irrigation purpose. A resource conservation plan needs to be prepared, and the same need to be implemented. |
| | | ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources | Setting up of Fodder Seed Processing Plant in modified habitat (waste land/ scrub land) may have impact on natural/ modified terrestrial habitat and ecological services. Biodiversity conservation plan shall be prepared and implemented, |
| | | ESS 5- Land Acquisition and Involuntary Resettlement | Refer to C.1.3 |
| C.2.4 | Demonstration of community level green fodder production | ESS 3: Resource Efficiency and Pollution Prevention | Water would be required for irrigation purpose. A resource conservation plan needs to be prepared, and the same need to be implemented. Pesticide use shall be restricted to minimise the impact on soil and water quality. |
| C.2.5 | Demonstration of Biomass Management Technologies | ESS 3: Resource Efficiency and Pollution Prevention | Refer to C.2.4 |
| C.2.6 | Pilot on Mobile Fodder Seed Processing Unit | ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts | This may applicable environmental pollution from the Fodder Seed Processing Plant. The unit need to carry out appropriate environmental and social assessment of subprojects and prepare and implement mitigation measures. |
| C.3 | Pilot on control of Bovine Mastitis & EVM | | |
| C.3.1 | Pilot on control of Bovine Mastitis | ESS 4 Community Health, Safety and Security | Improper handling and disposal of bio-medical waste may result in the spread of any communicable affecting the bovine or human population. The facility needs to prepare a community health and safety management plan and implement it. |
| C.3.2 | Pilot on propagation of Ethno-Veterinary Medicine (EVM) for bovine ailments | ESS 4 Community Health, Safety and Security | Refer to C.3.1 |
| C.4 | Manure Value Chain Development Programme | | |
| C.4.1 | Establishing Gobar gas Clusters | ESS 3: Resource Efficiency and Pollution Prevention | The proposed sub-component will reduce the GHG emission. |
| C.4.2 | Pilot on establishing slurry processing centres | ESS 3: Resource Efficiency and Pollution Prevention | Slurry generated from proposed sub-component shall be properly managed to mitigate land and water pollution. |
| | | ESS 4: Community Health, Safety and Security | Improper slurry management near the settlement may have potential impact on community health and safety. This need to be properly managed to mitigate the impact. |

| S. No. | Components & Subcomponents | Applicable ESS | Applicability |
|--------|--|--|---|
| | | ESS 5- Land Acquisition and Involuntary Resettlement | Refer to C.1.3 |
| C.5 | Pilot on Solar Energy solution for dairy | | |
| C.5.1 | Pilot on Rooftop Solar PV System at DCS/MMP | ESS 3: Resource Efficiency and Pollution Prevention | Refer to S. No. C.4.1 |
| C.5.2 | Pilot on Augmentation of BMC with solar powered instant milk chiller | ESS 3: Resource Efficiency and Pollution Prevention | Refer to S. No. C.4.1 |
| C.6 | Pilot on evolving Green House Gas (GHG) mitigation Strategies | | |
| C.6.1 | Pilot on measurement of Methane emissions in Progeny Testing (PT) projects | ESS 3: Resource Efficiency and Pollution Prevention | Refer to S. No. C.4.1 |
| C.6.2 | Pilot on development of feed additives for methane mitigation | ESS 3: Resource Efficiency and Pollution Prevention | Refer to S. No. C.4.1 |
| C.6.3 | Climate Smart Dairying – Pilot on evolving mitigation strategies for Carbon Foot print of dairy sector | IFC World Bank Group General EHS Guidelines | Suggests recommendations for reduction and control of greenhouse gases. |
| D. | Component D: Project Management and Learning | | |
| | Third-party quality assurance of civil works under the project | ESS 2: Labour and Working Conditions | Third party involvement in quality assurance of civil works under the project may have potential impact on working condition of the site. |

Table 4-2: Applicable Indian Regulations

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|--|--|--|--|
| A. | Component A: Enhancing Institutional Capacity and Sustainability | | | |
| A.1 | Institutional capacity building | | | |
| A.1.1 | Dairy Cooperative Society (DCS) level capacity building | <p>State specific co-operative society registration Acts are applicable on State specific stakeholders.</p> <p>The Co-Operative Societies Act, of all the States broadly provide information about co-operative principles, bye laws, management of funds and organization, settlement of disputes, offences and penalties and dissolution information</p> | <p>The NDSP II states may require formation and registration of new DCS.</p> <p>Registration under the Indian cooperative society registration acts can provide dairy cooperative societies (DCS) with legal recognition, formation of a cooperative structure, member empowerment, access to institutional credit, collective bargaining power, training and capacity building, and legal protection. These benefits can collectively strengthen dairy cooperative societies, making them more effective, efficient, and sustainable in their operations.</p> | <p>A Dairy Cooperative Society (DCS) is an autonomous association of dairy farmers, united voluntarily to meet their common economic needs can be registered at following links:</p> <p>Jharkhand - http://cooperative.jharkhand.gov.in/ModelControl/Coop.aspx?u=16</p> <p>Uttarakhand - https://cooperative.uk.gov.in/pages/display/166-dairy</p> <p>Odisha - https://sakhya.odisha.gov.in/ORCS/index.html#/society/info</p> <p>Madhya Pradesh https://cooperatives.mp.gov.in/en/application-for-registration</p> <p>Himachal Pradesh https://coophp.nic.in/Home/CoopSocietyLogin</p> |
| A. 1.3 | Farmer level capacity building | National Policy for Women (2016) | <p>According to the National Policy for Women (2016) efforts will be made to ensure that the schemes/ programs for training women in dairy development are expanded to benefit women working in the agriculture sector. Efforts will be made to utilize skills and capacities of successful.</p> | <p>Draft National Policy for Women can be accessed at following link - https://wcd.nic.in/sites/default/files/draft%20national%20policy%20for%20women%202016_0.pdf</p> |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--|---|--|---|--|
| | | | Women farmers as last mile extension workers and trainers or 'Krishi Sakhis' to extend agriculture extension services. | |
| A.2 | Human Resource Development | | | |
| A.2.1 | Deployment of Lady Extension Officer (LEO) | Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 | Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 will be applicable to provide protection against sexual harassment of women at workplace and for the prevention and redressal of complaints of sexual harassment and for matters connected therewith or incidental thereto. | The Project should have the procedure for Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) and same need to be implemented. |
| B. | Component B: Strengthening Dairy Market Development | | | |
| B.1 | Strengthening the dairy Supply Chain System | | | |
| B.1.2 | Strengthening village level milk chilling infrastructures | IS:3661-2019 | Bulk milk coolers shall meet the design requirements of Indian Standards | BMC design requirements can be accessed at following link - https://standardsbis.bsbedge.com/BIS_searchstandard.aspx?StandardNumber=IS+3661&id=10464 |
| Environment (protection) Rules, 1986 (Amendment Rules, 2022) | | The village level milk chilling infrastructure is Bulk Milk Cooler (BMC). A diesel genset (DG set) is required to meet the power requirement of the BMC. As per the Environment (Protection) Third Amendment Rules, 2022 effective from 01 July 2023 new emission standards were set for DG sets up to 800 kW. | BMC shall meet the emission norms prescribed at following link – https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS8zNThtfMTY2ODE2NjYzNI9tZWVpYXBob3RvMTkwNTgucGRm | |
| The Motor Vehicles Act, 1988 and Rules | | BMC's can have vehicles for milk collection from the MPPs. Also, the milk tankers visit | Motor vehicle registration, permit requirements and driving licence requirements under Motor | |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|----------------------------|--|---|--|
| | | | BMC daily to transport the milk to the processing plants. Federation owned or hired vehicles shall follow to prescribed rules mentioned under the Act. All the vehicles must have valid registration number with applicable permits. All the vehicle drivers must have appropriate driving licences for the class of vehicle operating. | vehicle Act can be accessed under following link – https://legislative.gov.in/sites/default/files/A1988-59.pdf |
| B.1.5 | Community Milking Centres | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. The Act includes provisions to ensure just compensation for individuals whose land is acquired, enhances transparency in the process of land acquisition for purposes such as setting up factories or buildings, infrastructural projects, and guarantees rehabilitation for those impacted by such acquisitions. | Establishment of community milking centre require land and may involve land procurement. | The provisions under the act can be accessed at following link - https://legislative.gov.in/sites/default/files/A2013-30.pdf |
| | | Central Groundwater Authority Guidelines & Ground Water (Regulation, Development and Management) Rules, 2007. Central Groundwater Authority Guidelines Notification 2020 The Central Ground Water Authority (CGWA) is a body established | Community Milking Centres need water for the cleaning of the premises, milk cans and the cattle. If borewells installed for the water requirements, then CGWA rules will be applicable. | As per the CGWA Guidelines dated 24 September 2020 Ground water extraction in NDSP-II Project States (except Himachal Pradesh) is being regulated by CGWA and NOC for ground water withdrawal shall not be issued in Over-Exploited areas. In Safe, Semi-Critical & Critical areas NOC for ground water withdrawal is mandatory subject to water audit |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|---|---|--|---|
| | | under Section 3 (3) of the Environment (Protection) Act, 1986, tasked with regulating and controlling the development and management of ground water resources across the country. CGWA exercises oversight over ground water extraction by issuing 'No Objection Certificates' (NOC) for various purposes, including industrial, infrastructure, and mining projects, to ensure sustainable and responsible ground water management practices. | | if abstracting ground water more than 100 m ³ /day. Respective State Governments are responsible for maintain and update the drilling database to CGWA portal Community Milking Centres may need to obtain NOC from CGWB accessed through following link – https://cgwa-noc.gov.in/LandingPage/index.htm However, for HP need to obtain NOC from State Ground water board. http://cgwb.gov.in › gw_profiles › st_HP |
| | | The Environment (Protection) Rules, 1986 | The community milking centres will generate huge quantity of wastewater and discharge standards shall be followed as per the act/ rule | The effluent discharge standards can be referred at following link - https://www.cpcb.nic.in/GeneralStandards.pdf |
| | | Environment (protection) Amendment Rules, 2022 | A diesel genset (DG set) is required to meet the power requirement of the community milking centres. As per the Environment (Protection) Third Amendment Rules, 2022 effective from 01 July 2023 new emission standards were set for DG sets up to 800 kW. | The community milking centres shall meet the emission norms prescribed at following link – https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS8zNThtMTY2ODE2NjYzNi9tZWVpYXBob3RvMTkwNTgucGRm |
| B.1.8 | Village level Milk Pasteurization and Product Manufacturing | Central Groundwater Authority Guidelines & Ground Water (Regulation, Development and Management) Rules, 2007. Central Groundwater Authority Guidelines Notification 2020 | Refer to B.1.5 | Refer to B.1.5 |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|----------------------------|--|--|---|
| | | <p>The Boiler's Act, 1923</p> <p>The enactment of this act aims primarily at ensuring the safety of life and property from the hazards posed by steam boiler explosions, and promoting consistency in the registration and inspection processes for boilers during their operation and maintenance in India.</p> | <p>Pasteurization process need steam of different temperature at different pressures generated from the boilers. Boilers and associated feed pipes installed in the pasteurization plant need to be inspected and registered under State department under the provision of the said Act.</p> | <p>Boiler registration and inspection can be done through specific State department</p> <p>Provisions of Boiler's Act can be accessed through this link - https://dpiit.gov.in/sites/default/files/boilerAct_1923_0.pdf</p> |
| | | <p>Environment (protection) Amendment Rules, 2022</p> | <p>DG sets will be used at the Pasteurization and product manufacturing unit to meet the power requirement. As per the Environment (Protection) Third Amendment Rules, 2022 effective from 01 July 2023 new emission standards were set for DG sets up to 800 kW.</p> | <p>The Pasteurization and product manufacturing unit shall meet the emission norms prescribed at following link – https://cpcb.nic.in/openpdf.php?id=TGF0ZXN0RmlsZS8zNTIhMTY2ODE2NjYzNi9tZWVpYXBob3RvMTkwNTgucGRm</p> |
| | | <p>The Air (Prevention and Control of Pollution) Act, 1981 Including Rules 1982 and 1983.</p> <p>The Air Act is a legislation enacted by the Parliament of India with the purpose of preventing and mitigating the adverse impacts of air pollution in the country. Regarded as a significant milestone, this act represents the initial and tangible effort undertaken by the Indian government to combat the issue of air pollution.</p> | <p>Pasteurization and product manufacturing unit are classified in "Orange" category by CPCB vide directives dated 07 March 2016. Thus, consent to establish (CTE) and consent to operate (CTO) operate need to be obtained before starting the commercial operation of the plant.</p> | <p>Pasteurization and product manufacturing unit need to obtain the CTE/ CTO from the specific State pollution control boards. The categorization of industries can be accessed at following link - https://cpcb.nic.in/uploads/Latest_Final_Directions.pdf</p> |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|------------|---|---|--|--|
| | | <p>The Water (Prevention and Control of Pollution), Act, 1974 including Rules, 1975 (as amended up to 1988).</p> <p>As per the Act of 1974, it is strictly prohibited to discharge sewage or pollutants into water bodies, including lakes, and it is the responsibility of the state pollution control board to intervene and put a stop to such activities. The Act specifically prohibits the disposal of any poisonous, noxious, or polluting substances into the flowing water of a stream, ensuring protection and preservation of water quality.</p> | | |
| B.2 | Strengthening the Sales and Marketing System | | | |
| B.2.1 | Provision of Visi-cooler, Chest coolers, Deep freezers, Instant Ice cream making units/ Softy Machines and Insulated crates in key outlets/ booths. | <p>Environment (protection) Amendment Rules, 2022</p> | <p>DG sets will be used at the outlets/ booths for power backup requirement. As per the Environment (Protection) Third Amendment Rules, 2022 effective from 01 July 2023 new emission standards were set for DG sets up to 800 kW.</p> | <p>The milk outlets/ booths shall meet the emission norms prescribed at following link – https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS8zNTFhMTY2ODE2NjYzNI9tZWRpYXBob3RvMTkwNTgucGRm</p> |
| | | <p>Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013</p> <p>The Act includes provisions to ensure just compensation for individuals whose land is acquired,</p> | <p>Most of the POIs already possess land for upgradation and modernization, the POIs will ensure that land is available for setting up of any additional infrastructure and is free from encumbrances. Project doesn't envisage any acquisition of private land and associated permanent rehabilitation or resettlement. However, RFCTLARR will be</p> | <p>POI need to assess the temporary displacement or loss of livelihoods due to the project activities and compensation as per RFCTLARR) Act, 2013</p> |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|--|---|---|--|
| | | enhances transparency in the process of land acquisition for purposes such as setting up factories or buildings, infrastructural projects, and guarantees rehabilitation for those impacted by such acquisitions. | applicable in cases of temporary displacement or loss of livelihoods due to the project activities | |
| B.2.2 | Installation of booths/ parlours/ kiosks on Government land/ institution premises given to them on a long-term lease for free or against nominal rent; | Environment (protection) Amendment Rules, 2022 | DG sets will be used at the outlets/ booths for power backup requirement. As per the Environment (Protection) Third Amendment Rules, 2022 effective from 01 July 2023 new emission standards were set for DG sets up to 800 kW. | The milk outlets/ booths shall meet the emission norms prescribed at following link – https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS8zNThtMTY2ODE2NjYzNI9tZWVpYXBob3RvMTkwNTgucGRm |
| | | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013 | Refer to B.2.1 | Refer to B.2.1 |
| B.3 | Enhancing Food Safety and Quality | | | |
| B.3.2 | Dairy Plant Improvement Programme | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. For details refer B1.5 | Expansion/ improvement of dairy pant may require additional land to be purchased or acquired which may involve land acquisitions. | The provisions under the act can be accessed at following link - https://legislative.gov.in/sites/default/files/A2013-30.pdf |
| | | Central Groundwater Authority Guidelines & Ground Water (Regulation, Development and Management) Rules, 2007. Central Groundwater Authority Guidelines Notification 2020 For details refer B 1.8 | Expansion/ improvement of dairy pant need water for daily operations and cleaning of the premises. If borewells installed for the water requirements, then CGWA rules will be applicable. | Application for NOC from CGWB can be accessed through following link – https://cgwa-noc.gov.in/LandingPage/index.htm However, for HP need to obtain NOC from State Ground water board. http://cgwb.gov.in/gw_profiles/st_HP |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|----------------------------|--|--|--|
| | | The Environment (Protection) Rules, 1986 For details refer B 1.2 | Expansion/ improvement of dairy plants will generate huge quantity of wastewater and discharge standards shall be followed as per the act/ rule | The effluent discharge standards can be referred at following link – https://www.cpcb.nic.in/GeneralStandards.pdf |
| | | Environment (protection) Amendment Rules, 2022 For details refer B 2.1 | DG sets may be used at the dairy plant for the additional power backup requirement after expansion/ improvement. As per the Environment (Protection) Third Amendment Rules, 2022 effective from 01 July 2023 new emission standards were set for DG sets up to 800 kW. | The dairy plant shall meet the emission norms prescribed at following link – https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS8zNTfhMTY2ODE2NjYzNI9tZWVpYXBob3RvMTkwNtgucGRm |
| | | Plastic Waste Management Rules, 2016 and amendment 2022 The Plastic Waste (Management and Handling) Rules established specific guidelines for the production, storage, sale, and usage of plastic carry bags and sachets. These guidelines were mandated to be overseen and enforced by the State Pollution Control Boards and Municipal Authorities. | Waste management in dairy plants is an important aspect to improve the quality. | CPCB Plastic waste link – https://cpcb.nic.in/rules-4/ |
| | | Construction and Demolition Waste Management Rules, 2016 The Construction and Demolition Waste Management Rules of 2016 are applicable to all individuals or entities involved in generating | Construction and Demolition Waste Management plan shall be prepared and implemented. | CPCB Plastic waste link – https://cpcb.nic.in/rules-7 |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|---|---|--|--|
| | | <p>construction and demolition waste. It is mandatory for every waste generator to separate and sort construction and demolition waste, and either deposit it at designated collection centers or hand it over to authorized processing facilities.</p> | | |
| B.3.3 | <p>Introduction/up-gradation of Food Safety Management System (FSMS) (ISO 22000/ FSSC 22000 and/or Quality Mark/ CAS MMP)</p> | <p>Scheme-IX of BIS (Conformity Assessment) Regulations (sixth amendment) 2021</p> <p>This scheme covers requirements of conformity assessment of milk and milk products for grant of BIS license in accordance with Scheme-IX of BIS (Conformity Assessment) (Sixth Amendment) Regulations, 2021 for Grant of license to use or apply Standard Mark for goods and articles conforming to Indian Standard(s)</p> <p>combined with conformity of management system to Indian Standard and conformity of process requirements to be read in conjunction with the of BIS (Conformity Assessment) Regulations, 2018 operated under the provisions of Bureau of Indian Standards Act 2016.</p> | <p>This comprehensive certification scheme covers all elements of a food safety management system in accordance with IS/ISO 22000, as well as product certification in accordance with relevant Indian standards and process certification in accordance with NDDDB's quality mark guidelines.</p> | <p>Integrated milk certification system link - https://www.bis.gov.in/system-certification-overview/certification-process/systems-under-certification/integrated-milk-certification-system/</p> |
| C. | Component C: Productivity Improvement and Enhancing Resilient Rearing Practices | | | |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|--|--|--|---|
| C.1 | Promotion of Scientific Feeding Practices | | | |
| C.1.2 | Calf Rearing Programme (CRP) for buffalo & cow calves | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. For details refer B1.5 | Setting up Calf Rearing centre require land and acquisition/ purchase shall be done through private or government channel as per the act. | The provisions under the act can be accessed at following link - https://legislative.gov.in/sites/default/files/A2013-30.pdf |
| | | Central Groundwater Authority Guidelines & Ground Water (Regulation, Development and Management) Rules, 2007. Central Groundwater Authority Guidelines Notification 2020 For details refer B 1.8 | Construction and operation of CRP need water for daily operations and cleaning of the premises. If borewells installed for the water requirements, then CGWA rules will be applicable. | Application for NOC from CGWB can be accessed through following link – https://cgwa-noc.gov.in/LandingPage/index.htm However, for HP need to obtain NOC from State Ground water board. http://cgwb.gov.in/gw_profiles/st_HP |
| C.1.3 | Village level producers' institutions based TMR Plant | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013. For details refer B1.5 | Refer to B.2.1 | Refer to B.2.1 |
| C.2 | Demonstration of Fodder Production & Conservation Technology | | | |
| C.2.1 | Setting up of Fodder Seed Processing Plant | The Seeds Act, 1966 & The Seeds (Amendment) Act, 1972; The Seeds (Control) Order, 1983. The seed (Control) order, 1983 was promulgated under essential commodities act, 1955 to ensure the production, marketing and equal distribution of the seeds. The object of Seed Act is to regulate the quality of certain notified kind / varieties of | The seed processing plant and green fodder demonstration will require land. Seed processing involves fodder seed development, processing, and distribution thus the act shall be applicable. Certification shall be conducted by the Certification Agency notified under Section 8 of the Seeds Act, 1966. | The working manual of seed certification can be accessed through following link - https://seednet.gov.in/cms/Home/Noticeandother/ISCWM.pdf |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|---|--|---|--|
| | | <p>seeds for sale and for matters connected therewith.</p> <p>Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013.</p> <p>For details refer B1.5</p> | <p>Green fodder demonstration will involve farming of fodder species on fields for the demonstration to farmers.</p> <p>Refer to B.2.1</p> | Refer to B.2.1 |
| C.3 | Pilot on control of Bovine Mastitis & EVM | | | |
| C.3.1 | Pilot on control of Bovine Mastitis | <p>Bio-Medical Waste (Management and Handling) Rules, 1998 and amendment, 2003</p> <p>According to the rules, Bio-medical waste shall not be mixed with other wastes. Bio-medical waste shall be segregated into containers/bags at the point of generation in accordance with Schedule II of the rule prior to its storage, transportation, treatment, and disposal. The containers shall be labeled according to Schedule III.</p> | The centre will generate biomedical waste and shall be disposed according to the rules prescribed. | <p>The handling of biomedical waste generated must be done as per the guidelines prescribed under</p> <p>CPCB biomedical waste guidelines link - https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/Guidelines_healthcare_June_2018.pdf</p> |
| C.4 | Manure Value Chain Development Programme | | | |
| C.4.1 | Establishing Gobar gas Clusters | <p>Revised categorization of Compressed Bio-Gas (CBG) plant and household Bio-digesters guidelines issued by CPCB on 22 September 2021.</p> <p>The revised categorization of CBG plants is based on their capacity,</p> | Household bio-digester/ gobar-gas (cow-dung) plant based on bio-digestible wastes etc. with feed slurry to digesters having volatile organic fraction more than 75% to be considered as under "White" category. | <p>CPCB link – https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS8zNDBfMTY0MTQ1OTkzNI9tZWVpYXBoY3RvNzQzOC5QREY=</p> |

| S. No. | Components & Subcomponents | Applicable Regulations | Applicability | Procedure |
|--------|----------------------------|--|---------------|-----------|
| | | <p>technology, and feedstock, and is classified into three categories: Small-scale CBG plants, Medium-scale CBG plants, and Large-scale CBG plants. The revised guidelines also outline the requirements for obtaining consent to establish and operate CBG plants and household bio-digesters, including the necessary documents, fees, and timelines. Additionally, the guidelines provide information on monitoring, reporting, and compliance requirements, as well as penalties for non-compliance.</p> | | |

5. BASELINE DESCRIPTION OF PROJECT STATES UNDER NDSP II

5.1 Introduction

This section presents the environmental and socio-economic baseline within which the NDSP-II will be implemented. The baseline is drawn from a primary survey of households, consumers, and retailers conducted in the five targeted states: Himachal Pradesh, Uttarakhand, Madhya Pradesh, Jharkhand, and Odisha and secondary information available in the public domain. The methodology followed for baseline data collection is as discussed in **Section 2.2**. The primary surveys started in the 3rd week of December and were completed in 2nd week of January 2023. The baseline captures key trends and implications of environmental and social indicators in the context of the dairy sector in transition.

5.2 Physical Environment

5.2.1 Land Environment

Land Use

Land is one of the important components to be analyzed under the baseline owing to its relevance in availability of grazing land. In India, about 49.38% of the land is under cultivation, 23.41% under forest and 3.36% under pasture¹. Built up areas and uncultivated land occupy about 12.34% (Kundra, 1999). About 5.17% of the total land is uncultivated waste, which can be converted into agricultural land. The other types of land uses comprised of up 4.67%. The state wise land use is presented in Table 5.1.

Table 5-1: Land use in five targeted states (2017)

| Water requirement | Uttarakhand | Himachal Pradesh | Madhya Pradesh | Jharkhand | Odisha |
|---|-------------|------------------|----------------|-----------|--------|
| Geographical Area ('000 ha) | 5348 | 5567 | 30756 | 758.20 | 15571 |
| Cultivable area (in %) | 11.70 | 11.90 | 46.54 | 33.67 | 34.83 |
| Forest Area (in %) | 63.42 | 24.70 | 26.10 | 21.01 | 37.33 |
| Land under Non-Agricultural Uses | 7.51 | 24.97 | 10.86 | 9.84 | 8.34 |
| Permanent Pastures (in %) | 3.20 | 32.89 | 3.95 | 0.26 | 3.17 |
| Culturable Waste Land (in %) | 5.29 | 2.64 | 2.80 | 3.47 | 2.41 |
| Land under Misc. tree crops and groves (in %) | 6.49 | 1.49 | 0.06 | 1.41 | 2.20 |
| Barren and uncultivable land (in %) | 4.16 | 17.08 | 6.81 | 5.22 | 5.39 |
| Current Fallows (in %) | 0.95 | 1.42 | 1.48 | 16.37 | 4.86 |
| Other fallow (in %) | 1.44 | 0.46 | 1.40 | 8.74 | 1.47 |

Source: Land use Statistics at a Glance 2008-2009 to 2017-18; Directorate of Economics & Statistics Department of Agriculture & Farmers Welfare Ministry of Agriculture and Farmers Welfare Government of India July 2021

Grazing land

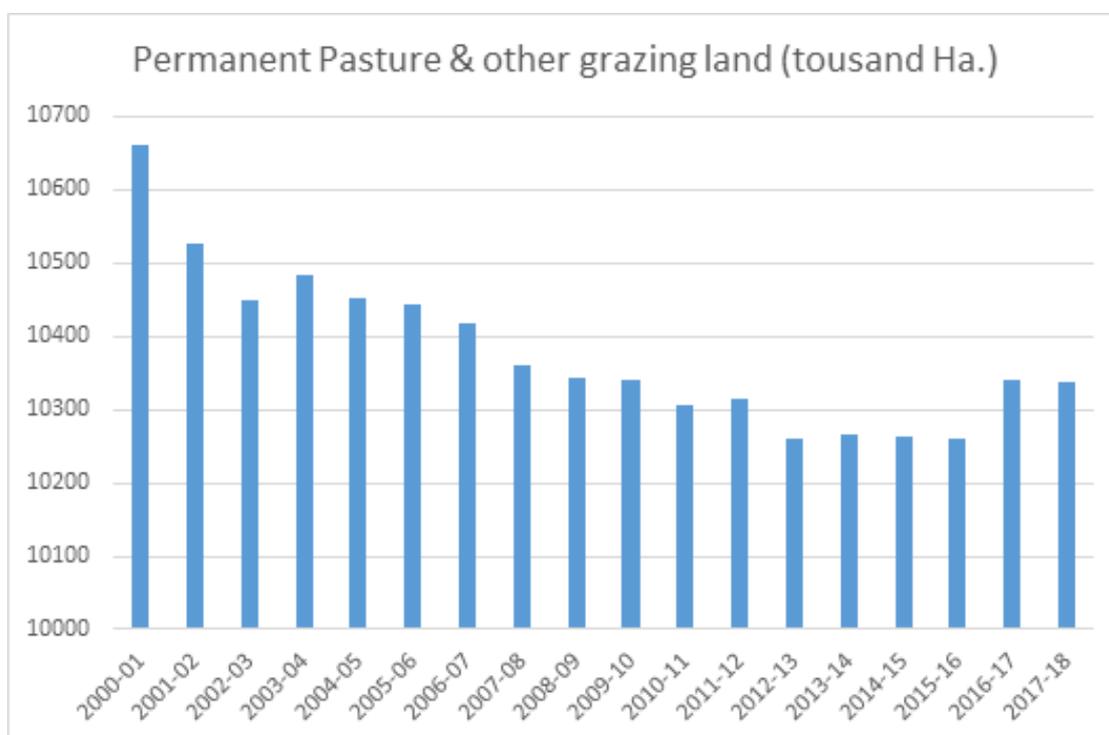
Shankar and Gupta (1992)² have classified the Indian grazing lands as fragileeco- systems and have ranked them as class IV and V in their land capability classification. The carrying capacity of these areas is 0.20 to 1.47 adult cattle units (ACU)/ha, but the present stocking rates are much

¹ Land use statistics at a glance; 2008-09 to 2017-18; Directorate of Economics & Statistics, Department of Agriculture & Farmers Welfare; Ministry of Agriculture & Farmers Welfare; GoI; July 2021

² Shankar, V. and Gupta, J.N. (1992). Restoration of Degraded Rangelands. In: J. S. Singh (ed.). Restoration of Degraded Lands-Concepts and Strategies. Rastogi Publications, Meerut, India, pp. 115-155

higher. In semi-arid areas, the present stocking rates are 1 to 51 ACU/ha against the carrying capacity of 1 ACU/ha while in the arid areas, the stocking rates are 1 to 4 ACU/ha against the carrying capacity of 0.2-0.5 ACU/ha. **Figure 5.1** captures the declining trend of pasture grazing land in the country since 2000-01.

Figure 5.1 Permanent Pasture & other Grazing Land trends in India



Source: Land use Statistics at a Glance 2008-09 to 2017-18; Directorate of Economics & Statistics Department of Agriculture & Farmers Welfare Ministry of Agriculture and Farmers Welfare Government of India July, 2021

5.2.2 Air Environment

5.2.2.1 GHG emission

The increasing concentration of greenhouse gases in the atmosphere is leading to the phenomenon of climate change which is a major concern of the entire world today. Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) are the major greenhouse gases contributed by anthropogenic sources.

The agriculture sector plays a very important role and in this too, enteric fermentation, manure management, rice cultivation) accounts for 61% of the total methane emissions in India, with 40% contributed by enteric fermentation, 17% from rice cultivation, and 4% from manure management (Garg et al.,2011³).

As per Grossi et.al 2019⁴ “Greenhouse Gas Emissions from Dairy Sector- A Life Cycle Assessment”, enteric fermentation process contributes about 39% GHG emission, processing and transportation contributes 6%, manure storage 10% and feed production 45%, which includes land use change, fertilizers & chemicals, manure excreted and applied to soil, agriculture operations, feed processing and transportation.

³ Garg Amit, Bhushan Kankal, P. R. Shukla. (2011). Methane emissions in India: Sub regional and sectoral trends, Atmospheric Environment 45 (28), 4922-4929

⁴ Grossi et.al. 2019. Animal Frontiers. Vol 9, Issue 1> Jan 2019

GHG Emission from targeted five States

The state wise GHG emission has been estimated with GHG Emission reduction strategy under the NDSP-II (refer to **Appendix Q**).

5.2.2.2 Air Emission Dairy Sector

Fugitive Dust

The Project's sub-components require civil construction (new facilities and renovation activities) that is likely to generate fugitive dust from the storage and handling of construction materials. During the field visit, it was observed that fugitive dust had been generated from the fodder processing units. The units do not have any pollution control devices or personal protective equipment (PPE) provided to workers.

Gaseous emission

The milk processing units have backup power facilities in the form of diesel generator (DG) sets. The operation of DG sets will release particulate matter (PM), nitrogen dioxide (NO₂), sulphur dioxide (SO₂), and carbon monoxide (CO) and carbon dioxide (CO₂) into the environment. The transportation of milk and milk product through vehicles will also release PM, NO₂, SO₂, CO and CO₂ into the environment.

Air emissions of methane (a GHG) is the main source from cattle enteric fermentation and from cattle dung in dairy industry.

Emission of Ammonia

Important sources of ammonia in dairy farms include long - term manure storage lagoons, fresh manure deposition, and the application of manure to agricultural fields (Place & Mitloehner, 2010; Won et al., 2017). However, there is significant variation in ammonia emissions from farm to farm depending on management practices, including cow diet, manure management system, method of manure application to agricultural fields (e.g., spraying or injection), and season (Place & Mitloehner, 2010).

Bioaerosols

Bioaerosols also present an important environmental health risk from dairy farms (Basinas et al., 2013; Douglas et al., 2018; Nygard et al., 2008⁵). Bioaerosols can remain suspended in the air for long periods and can also travel long distances from the original source, thereby posing a health risk to neighboring communities.

5.2.3 Water Environment

5.2.3.1 Consumption of Water in Dairy Sector

Water is one of the critically important resources required for dairy animal rearing and deriving economic value out of the animal during its lifespan. Water is essentially consumed at the following stages in the dairy sector:

- **Animal Rearing**
 - Dairy animal's drinking water intake,
 - Animal washing,
 - Animal waste removal (especially in peri-urban dairies where water is used for dung removal),
 - Cattle shed cleaning and washing (for a small proportion of households),
- **Milk Processing Units**

⁵ Basinas, I. , Sigsgaard, T. , Kromhout, H. , Heederik, D. , Wouters, I. M. , & Schlünssen, V. (2013). A comprehensive review of levels and determinants of personal exposure to dust and endotoxin in livestock farming. *Journal of Exposure Science & Environmental Epidemiology*, 25(2), 123–137. 10.1038/jes.2013.83

- Bulk milk collection centers (BMCs) cleaning,
- Chilling plants,
- Milk tanker (used for transport) cleaning and washing, and
- Fodder cultivation.

Dairy Animal Water Intake

Secondary literature reveals that dairy cows consume approximately 3 gallons (1 US gallon = 3.785 litres) of water for every gallon of milk production. Indian researchers in this regard have assumed a water intake of 25 liters per head for the cattle and buffalo population. Accordingly, the livestock water demand has been predicted to increase from 2.3 billion cum (BCM) in 2000 to 2.8 BCM by 2025 and 3.2 BCM by 2050, respectively (Upali A. Amarasinghe et al⁶).

The water intake by animals through forage and other feed ingredients is more as compared to water intake through drinking water and that used for on-farm servicing operations such as cleaning, etc. The average direct consumptive water use by smallholder system was found to be 67 litres per day and 122 litres per day for commercial dairies⁷.

Water Consumption in Milk Processing Units

As per the Environment (Protection) Rules, 1986 and amendment on Dairy Industry⁸, wastewater generation is 3 m³/per m³ of milk processed. Considering a factor of 1: 0.75 of water requirement: wastewater generation, the water requirement works out to be 4 m³ per m³ of milk processed

The state wise water intake in dairy sector has been discussed resource conservation strategy (Refer to **Appendix J**).

5.2.3.2 Ground Water Resource

The assessment of Ground water resources carried out by Central Ground Water Board (CGWB) Department of Water Resources determines the prevailing status of ground water resources in the country. It also helps assess the impact of the on-going ground water management practices on the groundwater resources.

Table 5.2 shows water stress situation across the five states and details has been discussed resource conservation strategy (Refer to **Appendix J**).

Table 5.2: Water Stress Situation in the five selected states⁹

| State | Dependency on Groundwater | GW Categorization | Baseline Water Stress |
|------------------|---------------------------|---------------------------------|-----------------------|
| Himachal Pradesh | 49% | Safe | Medium – High |
| Uttarakhand | 60% | Safe: 79% Semi-critical: 22% | Extremely High |

⁶ Amarasinghe UA, Shah T, Smakhtin V (2012) Water-milk nexus in India: a path to a sustainable water future?. International Journal of Agricultural Sustainability 10(1):93-108

⁷ Water Footprint - A Tool for Sustainable Development of Indian Dairy Industry October 2018 International Journal of Livestock Research 8(10):1-18; nkaj Thakur, Anshuman Kumar; et. al. 2018

⁸ <https://cpcb.nic.in/GeneralStandards.pdf>

⁹ Source: National Compilation on Dynamic Ground Water Resources of India, 2022; Central Ground Water Board Department of Water Resources, River Development & Ganga Rejuvenation Ministry of Jal Shakti Government of India and WRI Aqueduct Water Risk Atlas

| State | Dependency on Groundwater | GW Categorization | Baseline Water Stress |
|----------------|---------------------------|--|-----------------------|
| Jharkhand | 57% | Safe: 92% Over-exploited: 2% Critical - 2% Semi-critical: 4% | Low |
| Madhya Pradesh | 47% | Safe: 71% Over-exploited: 8% Critical - 2% Semi-critical: 19% | Extremely High |
| Odisha | 55% | Safe: 95% Semi-critical: 3% Saline: 2% | Low |

5.2.3.3 Water Quality Issues in Dairy Cattle Rearing¹⁰

Water quality is an important issue in dairy cattle production and health. The five properties most often considered in assessing water quality for both humans and livestock are organoleptic properties (odor and taste), physiochemical properties (pH, total dissolved solids, total dissolved oxygen, and hardness), along with the presence of toxic compounds (heavy metals, toxic minerals, organophosphates, and hydrocarbons), excess minerals or compounds (nitrates, sodium sulfates and iron) and bacteria and algae. Research on water contaminants and their effects on cattle performance are sparse. The following discussion attempts to define some common water quality problems in relation to cattle performance¹¹.

Drinking water intake by dairy cattle and buffalos is determined by the quality of water provided to the animal. Providing adequate quantity and good quality drinking water to dairy animals is critical and important in the rearing phase. Any reduced drinking water intake is not desired as it will have implications on the milk yield and animal's health.

5.3 Biological Environment

Baseline assessment of the biodiversity aspects of environment is limited to following parameters that are pertinent and relevant to the project:

- Fodder species, their area of cultivation and trends,
- Cattle population (covering indigenous, exotic, and cross bred species), specie-wise distribution, and growth trends, and
- Buffalo population and specie-wise distribution and growth trends.

5.3.1 Biodiversity in Forage Resources

There are about 620 genera with 10,000 species of grasses (Poaceae) and 650 genera with 18,000 species of legumes (Leguminosae), in the world. Of these, only about 40 grasses and legumes are used to appreciable extent in the establishment of sown pastures. Moreover, it has been found that livestock prefer indigenous forage species in comparison to selected varieties of grasses.

Major forage genera exhibiting forage biodiversity include legumes like Desmodium, Lablab, Stylosanthes, Vigna, Macroptelium, Centrosema, etc.; grasses like Bothriochloa, Dichanthium, Cynodon, Panicum, Pennisetum, Cenchrus, Lasiurus, etc. and browse plants such as Leucaena,

¹⁰ Importance of Water for Dairy Cattle, Dr. Rajesh Singh (Livestock & Poultry Consultant), Jamshedpur, Jharkhand, 2020

¹¹ Importance of Water for Dairy Cattle, Dr. Rajesh Singh (Livestock & Poultry Consultant), Jamshedpur, Jharkhand, 2020

Sesbania, Albizia, Bauhinia, Cassia, Grewia, etc. These genera besides many others form an integral part of feed and fodder resources of the country. The country is further endowed with the rich heritage of traditional know-how of raising, maintaining, and utilizing forage, feed and livestock resources and legumes despite the fact that indigenous species may be low in productivity and nutritive value.

5.3.2 Fodder (Forage) Cultivation – Demand and Supply

Estimates of fodder cultivation and production in the country vary widely. Dairy animals are normally fed with fodder available from cultivated areas, supplemented to a small extent by harvested grasses and top feeds. There are three (3) major sources of fodder supply that includes:

- Crop residues,
- Cultivated fodder, and
- Fodder from common property resources like forests, permanent pastures, and grazing lands.

Green and dry fodder are important components of animal ration and contribute between 50-60% to the total Dry Matter Intake (DMI) of dairy cattle. There is a deficit of 11.24 % of green fodder and 23.4% of dry fodder in the country (Roy et al, 2019¹²). As per this report, Mizoram, Himachal Pradesh, and Madhya Pradesh are surplus in green fodder and Uttarakhand, Jharkhand and Odisha are deficit in green fodder. As far as dry fodder is concerned, Jharkhand & Sikkim are deficit in dry fodder (refer to table below).

Table 5-3: Availability of fodder in six states

| States | Green Fodder (million tonnes per annum) | | | | Dry Fodder (million tonnes annum) | | | |
|------------------|---|-------------|-------------------|--------------|-----------------------------------|-------------|-------------------|--------------|
| | Availability | Requirement | % of Availability | % of Deficit | Availability | Requirement | % of Availability | % of Deficit |
| Jharkhand | 7.86 | 24.36 | 32.25 | -67.75 | 6.38 | 13.56 | 47.04 | -52.96 |
| Odisha | 15.28 | 27.70 | 55.15 | -44.85 | 18.20 | 16.12 | 112.90 | 12.90 |
| Madhya Pradesh | 99.18 | 67.26 | 147.45 | 47.45 | 37.48 | 37.17 | 100.83 | 0.83 |
| Himachal Pradesh | 12.06 | 8.38 | 143.86 | 43.86 | 6.34 | 4.07 | 155.86 | 55.86 |
| Uttarakhand | 3.82 | 8.58 | 44.51 | -55.49 | 8.36 | 4.21 | 198.42 | 98.42 |
| Sikkim | 0.19 | 0.37 | 51.43 | -48.57 | 0.44 | 0.19 | 236.58 | 136..58 |
| Total | 138.39 | 136.66 | 101.27 | 1.27 | 77.20 | 75.32 | 102.50 | 2.50 |

5.3.3 Role of Coarse Grain Cereals as Crop Residues

In animal feed supply, coarse cereals have a major role and four major cereals, viz. maize, barley, sorghum and pearl millet are specifically important.

Production of these cereals is stagnating at around 30 million tonnes in India. More importantly, most of the coarse cereals in the developed countries are mainly used for cattle feed and some of the cereals like barley are used in breweries. However, in India their use is mainly for direct consumption mostly by poor in the villages due to human population pressure.

Many minor millets such as: finger millet / ragi (*Eleusine coracana*), little millet (*Panicum milare*), kodo millet (*Paspalum scrobiculatum*), foxtail millet (*Setaria italica*), barnyard millet (*Echinochloa frumentacea*), proso millet (*Panicum milaceum*), and sava millet (*Echinochloa colona*), are important for fodder as it is for human population. The role of food grains and especially of the coarse cereals in providing the balanced nutrition to the livestock for ensuring higher productivity needs no emphasis.

¹² Revisiting National Forage Demand and Availability Scenario; A. K. Roy, et.al. 2019, ICAR- Indian Grassland and Fodder Research Institute, Jhansi

5.3.4 Area under Fodder Production

State wise available grazing land (permanent pastures/grazing lands, cultivable wastelands, fallow lands, land other than current fallows, and barren uncultivable wastelands) has been provided in **Table 5.1**. Highest grazing land is available in Himachal Pradesh is 39.09% of the geographical area; this is followed by Jharkhand (35.47%), Odisha (19.5%), Uttarakhand (17.37%) and Madhya Pradesh (16.5%).

Stakeholder consultation has been conducted to understand the availability of grazing land in the targeted five states. The summarized concerns are as follows:

- Village level grazing land are not available,
- Cultivable wastelands are being used for agriculture purpose,
- Government lands are being used for other purposes like housing, and
- Encroachment of grazing lands are being used for government housing scheme in their village.

5.3.5 Forage Conservation

India being a tropical monsoon bound country with unimodal rainy season, surplus green herbage is available at the flush growth periods during kharif as well as rabi (in irrigated areas). It is desirable that these are preserved/conserved with minimum loss of nutrients. In India, forage conservation or preservation is undertaken by the following methods for feeding to livestock during lean periods when availability of fresh forage is meagre or negligible (mid-October-mid December and mid-April-June):

- Hay making, and
- Silage or artificial dehydration

Silage has many advantages over the other methods of forage conservation. There is high-energy output in high temperature dehydration. Hay making is difficult during the monsoon season because of unscheduled rainfall and little availability of sunlight in addition to loss of nutrients due to leaching. Data on spatial extent across the country on forage preservation/conservation practices and quantity of forage preserved is not available readily. Hay making is largely followed across the country as there is traditional knowledge and across agricultural households whereas Silage practices have just started to be widely known in these targeted states. The surveyed household conserved the forage (dry fodder); state-wise data is as follows: Himachal Pradesh (44.73%), Uttarakhand (31.20%), Madhya Pradesh (43%), Odisha (74%), and Jharkhand (17%).

5.3.6 Seed Technology

Propagation of improved fodder production technologies specially improved varieties has not reached farmers mainly because of the non-availability of good-quality seeds. The availability of good-quality seeds is estimated to be around 15-25% only for cultivated fodders (ICAR, 2003). The productivity and availability of seed are vital because fodder crops have been bred for enhanced vegetative potential and as such they are shy seeders with very low seed productivity.

Presently, the seed demand of cultivated forages, range grasses and legumes are increasing tremendously. Grass seed production and distribution have remained isolated. Recent estimates put the current demand for seeds of cultivated fodders at 355,000 tonnes¹³/annum based on the area under cultivation (8.3 million ha) and a target replacement rate of 10%. With the development of number of improved and high yielding varieties in forage crops, it has become important that quality seed should be readily available and supplied to the farmers at reasonable price.

¹³ A Review of India's fodder production status and opportunities; Deo Narayan Singh, J.S Bohra, V. Tyagi, T. Singh, T.R Banjara, G. Gupta, Grass and Forage Science, Dec 2021.

5.3.7 Fodder Seed Processing Plant

In the country, Indian Council of Agricultural Research (ICAR) & Agricultural Universities are developing new varieties of fodder crops that are being notified by Government of India for bringing them to seed production chain. But due to lack of involvement of recognized central/state level seed production agencies in fodder seed production, quality seed of new fodder varieties are generally not available in adequate quantity to farmers. As a result, quality seed of new fodder varieties do not reach to farmers even after several years of release. Therefore, farmers are forced to use seed of locally grown varieties for fodder production. To increase quality fodder seed availability for farmers, there is a need to involve POIs in fodder seed production and develop their capacity for fodder seed production, processing & storage.

The fodder seed processing plant was not available in HP currently. Previously seed distribution was done by HP Milkfed. But it has been discontinued a few years ago. The state only has a Cattle Feed plant. Seeds are mostly purchased from local shops. The farmer is cultivating fodder on their own in their field traditionally in Uttarakhand, Madhya Pradesh, Jharkhand and Odisha. There is no existing facility provided such as seeds for fodder development by milk union or at DCS level, However, the distribution of processed seed was done by Department of Animal Husbandry and Dairying and Jharkhand Milk Federation.

5.4 Socio-economic Environment

This section discusses the socio-economic baseline that is currently prevailing across the five states of India, which is relevant in the context of this ESA study for NDSP -II project.

The baseline survey was undertaken across 150 villages in the State of Himachal Pradesh, Uttarakhand, Madhya Pradesh, Odisha, and Jharkhand covering 7,500 households. From each village around 50 milch animal owning households (in categories of large/Medium/small) were selected for detailed investigation.

5.4.1 Demography features of rural population

5.4.1.1 State wise Demography Profile

Largest number of dairy farmers, specifically small and marginal livestock owners lives in rural areas of the country. As per census 2011, rural population percentage to the total population of the country is approx. 69%. This is relatively higher in the five states of Himachal Pradesh, Uttarakhand, Madhya Pradesh, Jharkhand & Odisha. **Table 5-4** highlights broad demographic features of the five states.

Table 5-4 Demographic features of Rural Population in study area

| States | Total population (in million) | % of Rural Area | Sex ratio in Rural Area | SC% in Rural Area | ST% in Rural Area |
|------------------|-------------------------------|-----------------|-------------------------|-------------------|-------------------|
| Himachal Pradesh | 6.86 | 90.0% | 986 | 26.0% | 6.1% |
| Uttarakhand | 10.09 | 69.8% | 1000 | 21.3% | 3.8% |
| Madhya Pradesh | 72.63 | 72.4% | 936 | 15.7% | 27.2% |
| Jharkhand | 32.99 | 76.0% | 961 | 12.6% | 31.4% |
| Odisha | 41.97 | 83.3% | 989 | 17.8% | 25.7% |
| India | 1210.57 | 68.8% | 949 | 18.5% | 11.3% |

Source: Census 2011 data

5.4.1.2 Demography profile of surveyed HH

Demographic profile of the surveyed households in the five states provided in following table. The women headed household percentage varied from 24.1% (Jharkhand) to 47.1% (Odisha).

Table 5-5 Demographic of the Surveyed HH

| Component | Himachal Pradesh | Uttarakhand | Madhya Pradesh | Odisha | Jharkhand |
|----------------------------------|------------------|-------------|----------------|--------|-----------|
| Total Population (number) | 8752 | 9738 | 13716 | 9936 | 12070 |
| Sex Ratio | 922 | 890 | 798 | 923 | 760 |
| Average HH size | 5.8 | 6.5 | 9.1 | 6.6 | 8.0 |
| No. of Differently Abled Members | 78 | 33 | 252 | 50 | 39 |
| HH belong to BPL Category | 19.3% | 9.7% | 51.2% | 81.0% | 69.8% |
| No. of women headed Family | 28.6% | 29.1% | 32.1% | 47.1% | 24.1% |

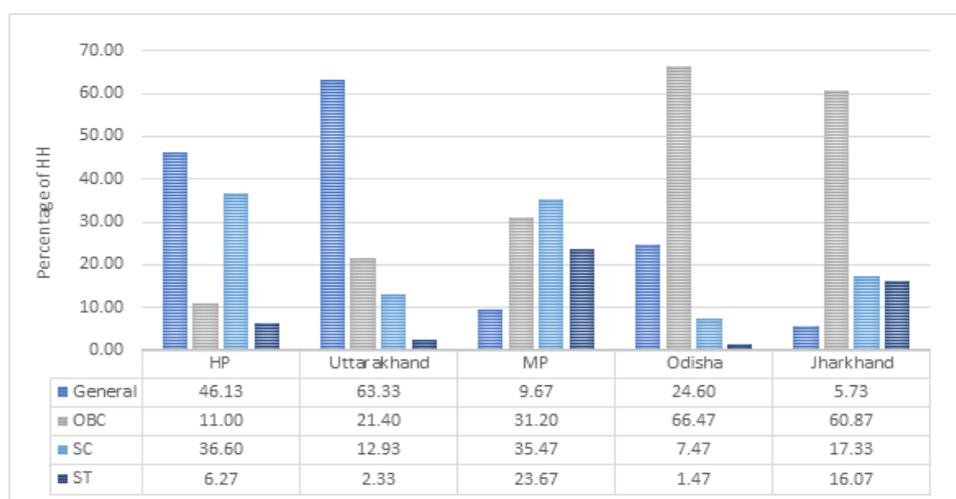
Source: ERM Household Survey 2022-23

5.4.2 Indigenous population

Jharkhand, Madhya Pradesh, and Odisha are the three major states in terms of significant proportion of Scheduled Tribes population in the rural areas.

The caste profile of the surveyed HH in the five states has been presented in following figure. The survey result indicates that most of the households are from the Other Backward Castes (OBC) as indicated in following table. The lowest percentage of ST population recorded in Uttarakhand (2.33%) and the highest in Madhya Pradesh (23.67%). The lowest percentage of SC population recorded in Odisha (7.47%) and the highest in Himachal Pradesh (36.60%).

Figure 5-2 Caste Profile of the households surveyed



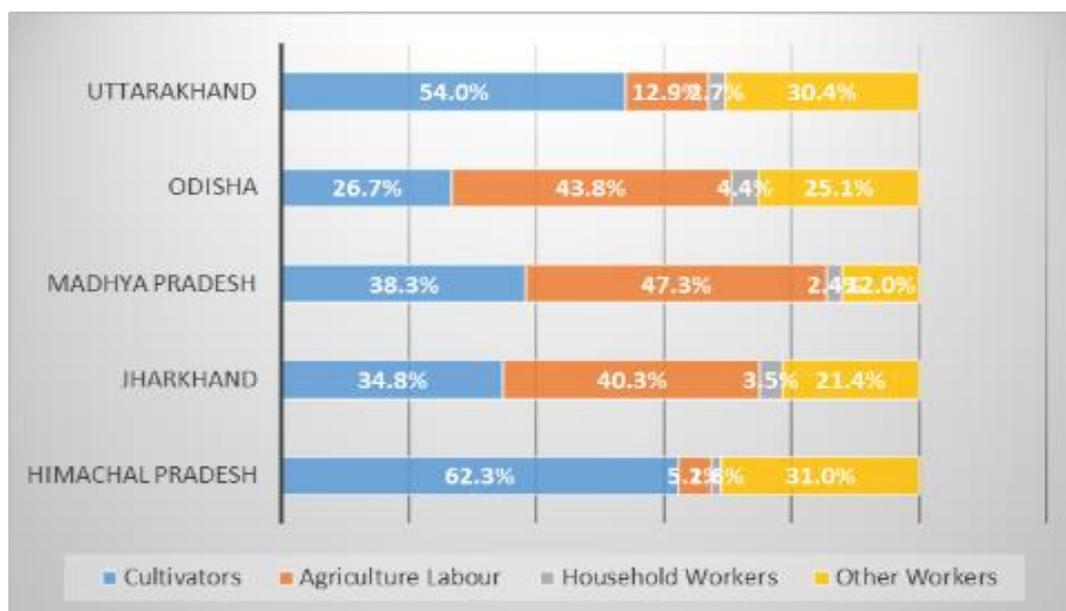
Source: ERM Household Survey 2022-23

5.4.3 Role of Dairy in occupational Pattern

5.4.3.1 Occupational Pattern Census data

Occupational pattern in rural area of the five states as per census 2011 data highlights that cultivators are in higher proportion in hill states (i.e., Uttarakhand and Himachal Pradesh). Whereas Agriculture Labours are maximum in remaining three areas. **Figure 5-3** presents overall distribution of total working population in rural areas in these five states.

Figure 5-3 Total working population distribution in Rural Areas



Source: Census 2011 data

Agriculture is the mainstay of the rural economies in these five states. Consultations with villagers in sample villages and districts broadly indicate that dairy also contributes to livelihood for significant number of households in those villages.

5.4.3.2 Occupation Profile as per HH survey

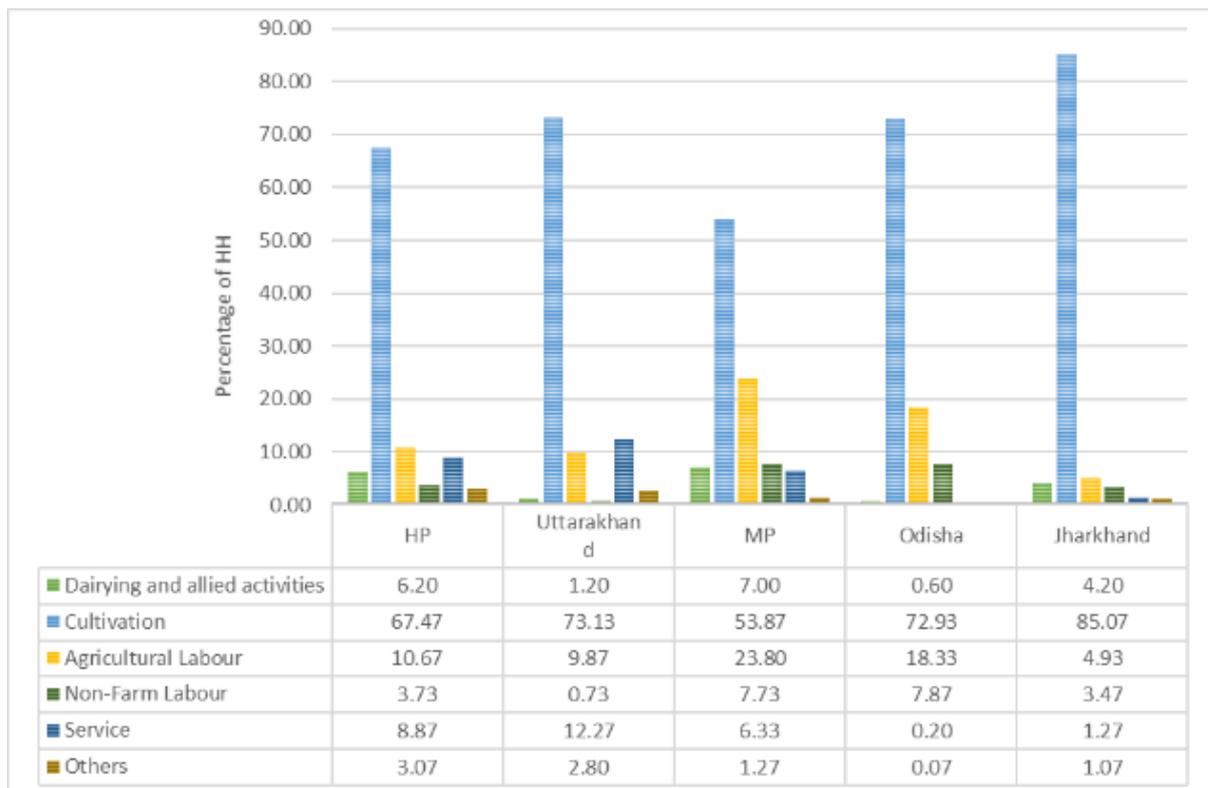
Primary Occupation

The occupation profile of the surveyed HH in the five states has been presented in following figure. The primary occupational profile of the surveyed HH indicates that cultivation is the predominant occupation, and it was varied from 53.87% in Madhya Pradesh to 85.07% in Jharkhand. The dairy and allied activities involvement was varied from 0.60% (Odisha) to 7.0% in Madhya Pradesh.

Secondary Occupation

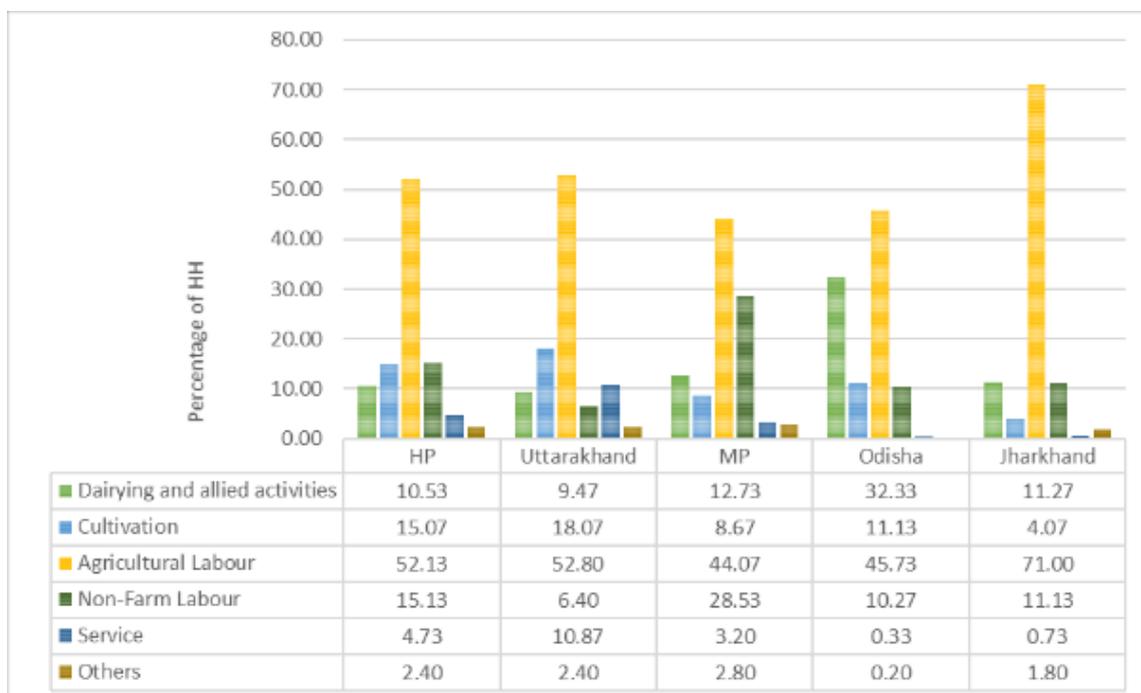
The secondary occupational profile of the surveyed HH indicates that agriculture labourer is the predominant occupation and it varied from 44.07% in Madhya Pradesh to 71.00% in Jharkhand. The dairy and allied activities involvement was varied from 9.47% (Uttarakhand) to 32.33.0% in Odisha.

Figure 5-4 Primary Occupational Profile of the surveyed HH



Source: ERM Household Survey 2022-23

Figure 5-5 Secondary Occupational Profile of the surveyed HH



Source: ERM Household Survey 2022-23

5.4.4 Land ownership

The analysis of the socio-economic baseline is done to understand the significance of influence of landholdings and landownership on several aspects of the dairy sector, such as dairy-based income, participation, ownership of cattle etc. Based on the amount of land they owned, the respondents/households have been categorized as follows:

- Marginal farmers with less than 2.47 acres (1 ha) of land,
- Small farmers with 2.48 to 4.94 acres (>1ha to 2 ha) of land,
- Semi-medium farmers with 4.95 to 9.88 acres (> 2ha to 10 ha) of land,
- Medium farmers with 9.88 to 24.7 acres (> 4 ha to 10 ha) of land, and
- Large farmers with over 24.7 acres (> 10 ha) of land.

Figure 5.6 provides an illustrative break-up of the proportion of each of these categories in the sample and indicates that 52% of the households across the surveyed states comprise of marginal farmers owning 1 hectare (or 2.47 acre) of land or less.

Figure 5-6 Land Ownership Pattern of the Dairy Farmers

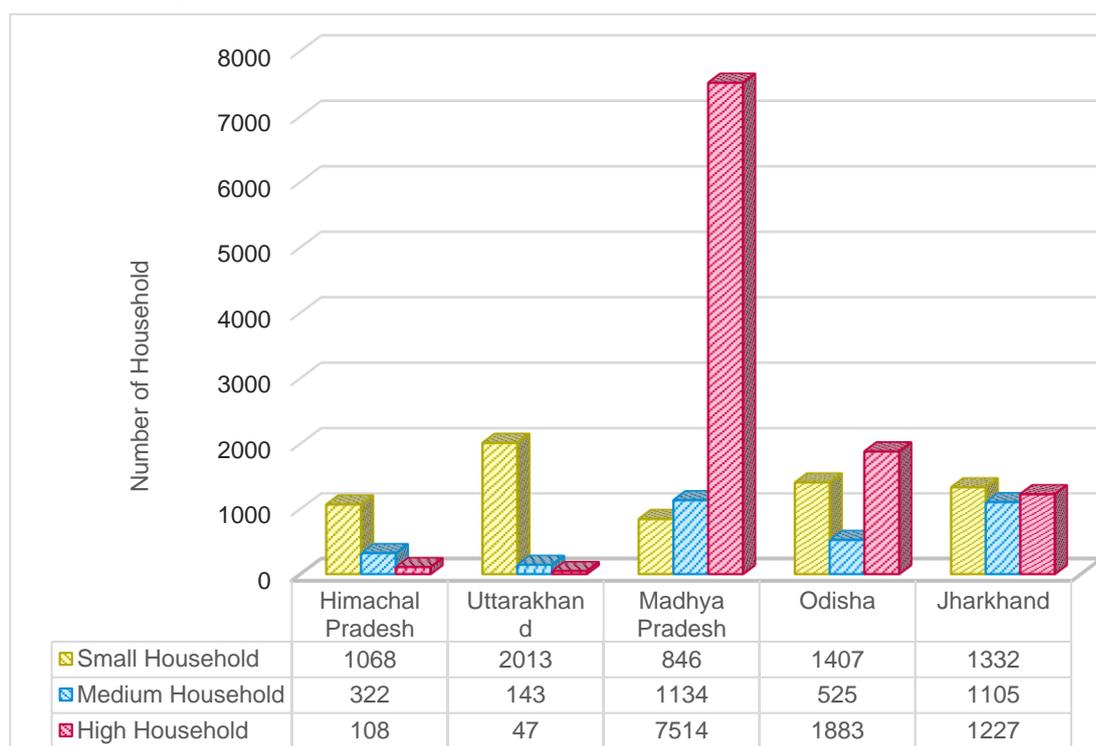


Source: ERM Household Survey 2022-23

5.4.5 Livestock Ownership

Based on the number of cattle population households surveyed were classified into small (1 to 3 animals), medium (3 to 5 animals) and high (more than 5 animals). It has been observed that 59% of the households surveyed belong to 'small' category from which almost 30% of milk is sourced. The household category wise milch animal population has been presented in **Figure 5.7**. The higher number of milch animal was recorded in small category households in Himachal Pradesh and Uttarakhand. The higher number of milch animal was recorded in large category households in Madhya Pradesh.

Figure 5-7 State wise Milch Animal in surveyed Households



Source: ERM Household Survey 2022-23

5.4.6 Milk Production

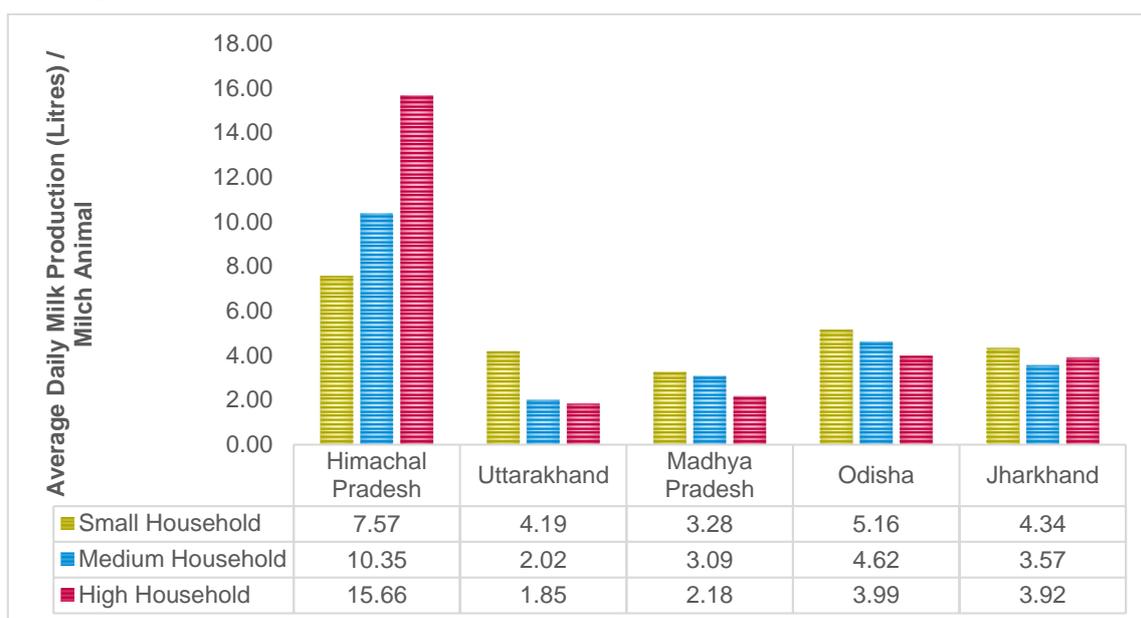
The data generated at the household level in the study area, was analysed to assess the average milk produced per household per day. The average milk production in small households varied from 3.28 litres per milch animal in Madhya Pradesh to 7.57 litres per milch animal in Himachal Pradesh. The average milk production in medium-sized households varied from 3.09 litres per milch animal in Madhya Pradesh to 10.35 litres per milch animal in Himachal Pradesh. The average milk production in high-sized households varied from 1.85 litres per milch animal in Uttarakhand to 15.66 litres per milch animal in Himachal Pradesh. State wise data has been presented in **Figure 5.8**. The average daily milk production per milch animal varied from 2.38 liters in Madya Pradesh to 8.75 liters in Himachal Pradesh. State wise milch animal and milk production has been presented in **Table 5.6**.

Table 5-6 Daily Milk Production in surveyed Households

| Household Category | Himachal Pradesh | | Uttarakhand | | Madhya Pradesh | | Odisha | | Jharkhand | |
|---------------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|
| | No. of Milch Animal | Daily Milk Production (in Litres) | No. of Milch Animal | Daily Milk Production (in Litres) | No. of Milch Animal | Daily Milk Production (in Litres) | No. of Milch Animal | Daily Milk Production (in Litres) | No. of Milch Animal | Daily Milk Production (in Litres) |
| Small HH | 1068 | 8084 | 2013 | 8444 | 846 | 2779 | 1407 | 7262 | 1332 | 5782 |
| Medium HH | 322 | 3334 | 143 | 289 | 1134 | 3499 | 525 | 2426 | 1105 | 3945 |
| High HH | 108 | 1691 | 47 | 87 | 7514 | 16346 | 1883 | 7515 | 1227 | 4811 |
| Total | 1498 | 13109 | 2203 | 8820 | 9494 | 22624 | 3815 | 17203 | 3664 | 14538 |
| Average milk production/ milch animal | | 8.75 | | 4.00 | | 2.38 | | 4.51 | | 3.97 |

Source: ERM Household Survey 2022-23

Figure 5-8 Monthly Milk Production (litres) across Surveyed States



Source: ERM Household Survey 2022-23

5.4.7 Workforce involvement at HH level

Table 5.6 indicates the involvement of family members in dairying and allied activities across all surveyed States. Except in the State of Jharkhand, in rest of the surveyed states it has been observed that mostly family members are well engaged with the dairy related activities. It has also been understood from household level survey that labours are also hired by the family members for dairying and allied activities.

Table 5-7 Involvement in Dairying and allied Activities (in Percentage)

| Parameter | Himachal Pradesh | Uttarakhand | Madhya Pradesh | Odisha | Jharkhand |
|---|------------------|-------------|----------------|--------|-----------|
| Family members involved (%) | 77.0 | 71.8 | 87.3 | 82.8 | 82.4 |
| Both family members and Hired labours (%) | 23.0 | 28.2 | 12.7 | 17.2 | 17.6 |

Source: ERM Household Survey 2022-23

The work participation among men and women in different activities and animal rearing has been presented in the following table. The survey results showed that both men and women participated more in various dairy farming activities across all the states.

State-wise, the highest work participation by women was in Jharkhand, and the lowest was in Odisha. Activity-wise, higher women's participation was recorded in cleaning animals, cow-dung management shed cleaning, and milking.

Table 5-8 Gender wise work Participation (in Percentage)

| States | Men/ women/ both | Grazing | Cleaning of animals | Cow-dung Management | Shed Cleaning | Stall- feeding | Milking | Processing of Milk products | Milk selling | Fodder collection |
|------------------|------------------------|---------|------------------------|------------------------|------------------|-------------------|---------|-----------------------------------|--------------|----------------------|
| Himachal Pradesh | Men | 34.12 | 24.94 | 19.16 | 21.89 | 23.86 | 22.99 | 26.64 | 31.82 | 14.07 |
| | Women | 14.50 | 10.96 | 22.89 | 14.81 | 19.50 | 28.18 | 22.49 | 12.06 | 16.51 |
| | Both | 51.38 | 64.10 | 57.95 | 63.30 | 56.64 | 48.83 | 50.87 | 56.13 | 69.42 |
| Madhya Pradesh | Men | 49.43 | 29.05 | 25.17 | 14.77 | 10.84 | 21.67 | 19.35 | 52.65 | 31.82 |
| | Women | 10.05 | 24.70 | 24.25 | 17.45 | 23.08 | 24.80 | 23.12 | 16.89 | 21.43 |
| | Both | 40.52 | 46.25 | 50.58 | 67.79 | 66.08 | 53.52 | 57.53 | 30.46 | 46.75 |
| Odisha | Men | 47.92 | 43.61 | 33.33 | 18.33 | 5.33 | 33.99 | 27.78 | 5.29 | 5.26 |
| | Women | 8.41 | 4.09 | 4.86 | 37.22 | 4.00 | 5.79 | 0.00 | 0.53 | 0.00 |
| | Both | 43.67 | 52.30 | 61.81 | 44.44 | 90.67 | 60.21 | 72.22 | 93.65 | 94.74 |
| Jharkhand | Men | 2.27 | 10.03 | 37.97 | 39.66 | 26.83 | 27.51 | 0.00 | 9.73 | 7.96 |
| | Women | 37.78 | 72.95 | 54.20 | 55.59 | 65.45 | 49.51 | 70.97 | 36.28 | 86.57 |
| | Both | 1.31 | 1.22 | 2.03 | 0.68 | 2.44 | 1.29 | 0.00 | 2.65 | 1.00 |
| Uttarakhand | Men | 44.79 | 11.73 | 8.17 | 15.00 | 14.04 | 31.80 | 25.00 | 62.50 | 10.00 |
| | Women | 16.49 | 10.13 | 34.60 | 20.63 | 19.30 | 10.49 | 14.29 | 3.13 | 0.00 |
| | Both | 38.72 | 78.13 | 57.22 | 64.38 | 66.67 | 57.70 | 60.71 | 34.38 | 90.00 |

Source: ERM Household Survey 2022-23

5.5 Dairy Sector Baseline

The dairy sector baseline study also conducted in the household survey. The analysis has been provided in **Appendix C**.

5.6 Consumer Survey Baseline

This study aims to identify the major factors influencing the consumers to prefer milk products and to analyze the awareness level of the consumers. In this study the data is obtained through a structured questionnaire from consumers considering convenience sampling under the nonprobability sampling techniques. Survey results are derived from 3,000 consumers interviews conducted during study period. The details is provided in **Appendix D**.

5.7 Retailer Survey Baseline

A total of 3000 people were interviewed for this survey. Only 7% of the respondents were female. In the state of Odisha, 8.33% respondents were female, which is highest among other four states. The details is provided in **Appendix E**.

6. STAKEHOLDER ENGAGEMENT

6.1 Stakeholder Consultations

As part of Environment Social Assessment process, number of consultations and focused group discussions with stakeholder groups (project affected parties, other interested parties and disadvantaged or vulnerable & identified individuals or groups) were undertaken across five states.

6.2 Stakeholder Mapping and Profiling

Stakeholder mapping is the process used during project management to identify the stakeholders and the level of engagement of different stakeholders during the NDSP-II Project lifecycle. Identification of Stakeholders is the first step of preparing a Stakeholder Engagement Plan. At the outset, the stakeholders are identified by following categories:

- **Project Affected Parties:** those likely to be affected by the project because of actual impacts because of the services envisaged in the Project. These include DCSs/MPPs, Milk Unions/Producer Companies, Milk Federations, Dairy Farmers, Retailers / Whole sellers of milk & milk products, BMCs, Chilling Plants, Milk booths / parlors / kiosks, animal health workers etc.
- **Other Interested Parties:** The term “other interested parties” refers to individuals, groups, or organizations with an interest in the project, which may be because of the project location, its characteristics, its impacts, or matters related to public interest. These would include NDDB, ICAR/Agriculture University/ Regional Fodder Station, Animal Nutrition Officer, Food Inspector/FSSAI Offices, District Veterinary Departments, Veterinary Hospital/College, Branding agencies for marketing, Media (local FM Radio, Newspaper, Ad agencies, and local cable network), NGOs, Cattle Feed Plant, Seed Production Plant, Department of Animal Husbandry and Dairying (DAHD), Biogas/Manure Management Plant etc.
- **Disadvantaged or vulnerable and identified individuals or groups:** refers to disadvantaged or vulnerable refers to those who may be more likely to be adversely affected (may be temporarily). Such an individual/group that may be excluded from/ unable to participate fully in the mainstream consultation process and as such may require specific measures and/or assistance to do so like dairy farmers having lesser influence in participation and decision making across the value chain such as women dairy farmers, women members of DCSs, SC/ST farmers etc.

Brief profiling of the stakeholders identified under three broad categories as defined above, is presented in below mentioned **Table 6-1**.

Table 6-1 Brief profiling of the project stakeholders

| S No | Specific Stakeholder | Likely impacts from Project investment | Specific Engagement/Information Needs |
|---------------------------------|---|---|---|
| Project Affected Parties | | | |
| 1 | Dairy Farmers including graziers/Milk Producers | Several direct and indirect positive impacts are anticipated at farmer level such as enhanced dairy extension services for existing members of DCS/MPP and for new farmers in untapped areas, doorstep service delivery, value added services, timely payment, awareness on quality milk and scientific calf rearing practices, stable and better rates for milk supply, reducing monopoly of | <ul style="list-style-type: none"> ■ Seek information on advantages of forming new DCS/MPP and becoming members, ■ Information on awareness program on dairy related extension services, ■ Information on available government schemes related to dairy, ■ Awareness on benefits, eligibility criteria and procedures to access dairy related government schemes and allied extension services, |

| S No | Specific Stakeholder | Likely impacts from Project investment | Specific Engagement/Information Needs |
|------|--|---|--|
| | | private agencies in untapped area, improved access to other dairy related government schemes, improved access to awareness programmes on animal health/ disease control/ silage production/ fodder conservation/safe milking practices, access to community milking parlour etc. | <ul style="list-style-type: none"> ■ Knowledge about benefits of dietary supplements and scientific calf rearing ■ Information on Training and capacity building opportunities for farmers under the Project, ■ Awareness on disease management and veterinary services at doorstep, ■ Awareness and access to functional GRM of the Project. |
| 2 | Customer/retailers / distributor of milk & milk products/ Milk Booths | Expanded milk product portfolio, increased shelf life of milk products, better quality milk availability, increased sale and business opportunity for retailer and distributors. | <ul style="list-style-type: none"> ■ Awareness on milk quality and safety issues, ■ Awareness on availability of milk and milk products adhering to high quality norms, ■ Prior information on engagement with retailers/ distributor/ wholesalers as part of market survey and brand; development program under the Project, ■ Access to functional GRM of POIs. |
| 3 | Dairy Cooperative Societies (DCS) / Milk Pooling Points (MPP) | Positive impacts envisaged in terms of increased number of DCSs/ MPPs, getting untapped areas into organised milk market, strengthening DCS/MPP with required infrastructure (like ICT based AMCS, roof top SPV system with battery back-up, mastitis testing kit), access to awareness program on dairy services for DCS/MPP members, etc. | <p>Key engagement needs at DCS/MPP level include:</p> <ul style="list-style-type: none"> ■ Prior information to DCS and members on camps proposed to be organized during the specific month/ quarter by related department (e.g., veterinary hospital). ■ Awareness camp on benefits of community milking centre, milking machines, ■ Training/Capacity Building on milk quality, milk production, animal feeding practices, fodder production & conservation, biogas, ■ Organise camps to address all vaccination, animal health and first aid related queries and needs of the DCS/ MPP, ■ Awareness program on scientific calf rearing practices and other dairy related topics, ■ Provide information on ways to access AMCS/digital tracking system and quality testing equipment's at DCS/MPP level for bringing more transparency in milk procurement system. |
| 4 | Village level functionaries such as AI technician, DCS secretary, Pashu Sakhis, Sahayaks, Animal Health Workers and other resource persons | Employment/income generation opportunities under the project for village level functionaries, training and capacity building opportunities, incentives, empowerment, increased area for interventions. | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project interventions and benefits, ■ Information on training and capacity building opportunities for village level functionaries, ■ Clarity on incentives and conditions of work for the functionaries. |

| S No | Specific Stakeholder | Likely impacts from Project investment | Specific Engagement/Information Needs |
|------|---|--|---|
| 5 | Workers engaged in operating BMCs, Chilling Plant, Dairy Plant, Milk Unions | Employment/income generation opportunity creation under the project at different level for the local workforce, training and capacity building opportunities, incentives, empowerment, increased area for interventions. | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project interventions and benefits, ■ Information on training and capacity building for workers engaged on BMCs/Chilling plant, dairy plants, ■ Clarity on incentives and conditions of work, ■ Prior Information on potential employment opportunities for local workforce of POIs, ■ Access to functional GRM of POIs. |
| 6 | State Milk Federations, | Enhanced quality milk supply in states, funds availability for dairy promotion activities, training, and capacity building opportunity, better equipped to handle enhanced competition with private players in the state, improved channel for delivery of dairy services. | <ul style="list-style-type: none"> ■ Information on details of NDSP Phase project-II components and sub-components (eligibility criteria, funding pattern, pilot programmes, etc.), ■ Information on applicable E&S requirements/ compliances during project implementation, ■ Mechanism for ensuring convergence with other dairy development schemes in the state, ■ Seeking regular project implementation update from POIs. |
| 7 | Milk Unions/Milk Plant, | Project interventions will lead to positive impact for Milk unions and their milk plants such as increased membership, Increased milk collection, increased income for members, empowerment of milk unions, leadership development, enhanced technical and managerial capacity, higher production of quality milk and milk products, enhanced competition, plugging infrastructure gaps requirement etc. | <p>Key engagement needs at Milk union level will include:</p> <ul style="list-style-type: none"> ■ Information on details of NDSP Phase-II components and sub-components (eligibility criteria, funding pattern, pilot programmes, proposal preparation and submission process, approval process etc.), ■ Strengthening governance at milk union level through targeted capacity building program, ■ Access to project resources for addressing capacity and technical constrains for improving coverage and milk collection, ■ Training and awareness programme for the staff deployed in various department of Milk Unions, ■ Information on applicable Environment & Social requirements/compliances that will be applicable during Project implementation, ■ Awareness on Health and Safety measures for workers. |
| 8 | Milk Producer Companies/Farmer Producer Organization (FPO)/Milk Producer | Positive impact envisaged in terms of improved milk collection, increased milk supply, increased sale and profitability, rise in MPP membership, improvement in delivery of dairy services to milk producers/members, enhanced | <ul style="list-style-type: none"> ■ Awareness on proposed intervention under NDSP Phase-II project for milk producer companies to ensure better access to the program, ■ Clarity on the scope and areas for sub-project planning, |

| S No | Specific Stakeholder | Likely impacts from Project investment | Specific Engagement/Information Needs |
|---------------------------------|--|--|---|
| | Organization formed by SHGs, | supply of quality milk and milk products | <ul style="list-style-type: none"> ■ Improved capacities and handholding support for preparation of sub-project plans and their implementation, ■ Information on applicable E&S requirements/ compliances that will be applicable during implementation, ■ Awareness on Health and Safety measures for Workers. |
| Other Interested Parties | | | |
| 14 | ICAR/Agriculture University/ Regional Fodder Station/ Veterinary College | sharing of technical knowhow, capacity transfer, knowledge exchange, support and exposure to project supported pilots and studies | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project interventions, specifically around capacity building and technical interventions including pilots & studies, ■ Information on potential engagement opportunities as training and capacity building expert agency, ■ Information on Training needs assessment and development of training curriculum for Project. |
| 15 | Veterinarian/ Veterinary hospitals/clinic at district/block/ panchayat level | Greater convergence with project interventions, reduced disease load (e.g., bovine mastitis) on animals, improved efficiency of their own services, capacity building and collaboration opportunity. | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project interventions, ■ Clarity on procedures for accessing support/services under the project for dissemination among dairy farmers/ community members, ■ Awareness on potential collaboration with project interventions like Training and capacity building on EVM, Disease surveillance and prevention, organise awareness camps on animal health and related government schemes available for farmers. |
| 16 | Transport service provider (Milk & milk products/seed/fodder etc.) | Impact on air environment from emissions from the vehicles engaged by POIs including those engaged from third parties for transportation of milk & milk products, feed & fodder etc. Impact on community health & safety from plying of vehicles used by POIs | <ul style="list-style-type: none"> ■ Awareness for drivers and vehicle owners on the issue of community health & safety and emission norms on CPCB vehicular Emission standards. |
| 17 | Cattle Feed Plant/TMR Plant / Seed Processing/ Silage manufacturers | Higher production in view of higher fodder demand, increased income opportunities for farmers due to higher demand of raw material for fodder production, better feed quality, improved access for members, improved income opportunity for local workforce for additional employment opportunities in plants. | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II project interventions, ■ Prior information on Training and capacity building opportunities on feed production and Total Mixed Ration (TMR), ■ Awareness on regulatory compliance requirements. |

| S No | Specific Stakeholder | Likely impacts from Project investment | Specific Engagement/Information Needs |
|--------------------------|--|--|--|
| 18 | FSSAI (Food Safety and Standards Authority of India) | Better adherence to compliance with food quality and safety norms, contribute in promoting quality product through certification and audits. | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project and measures for improved safety, ■ Seeking food safety compliance reports, ■ Coordination with POIs for certification and safety audits. |
| 19 | Other Government department like Labour Department, Environment department etc.) | Better compliance to applicable Environment & Social regulatory norms through project. | <ul style="list-style-type: none"> ■ Process of obtaining applicable license and permits, ■ Seeking periodic compliance reports, ■ Measures in place for ensuring; regulatory compliance under the project, ■ Coordination with POIs for convergence with other labour welfare schemes. |
| 20 | NGOs | Social mobilisation support, contribute in better access to project services for milk producers | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project interventions, ■ Procedures for accessing service and support to facilitate inclusion of dairy farmers specially women and other vulnerable groups, ■ Access to functional GRM for the Project. |
| Vulnerable Groups | | | |
| 27 | Women members of community engaged in dairy | Project aims at encouraging 50% women in each participating groups resulting in several positive impacts such as: increased women participation, greater women participation in entrepreneurship development program and DCS/MPP functioning, leadership opportunities for women members, enhanced opportunity and ways to access veterinary services/extension, training and capacity building opportunity, access to cleaner & low cost fuel reduced drudgery for women members of household, possible SEA/SH concerns during project implementation | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project, ■ Awareness on women centric project interventions and benefits under the Project, ■ Information on ways for enhancing participation of women farmers and entrepreneurs, ■ Awareness on eligibility criteria for accessing Project support, ■ Awareness on trainings and capacity building opportunities available with Project, ■ Awareness on eligibility criteria for employment as Lady Extension Officer in Project, ■ Access to functional GRM for the Project |
| 28 | Scheduled Caste community | Positive impact anticipated for SC community as well in terms of their increased participation in project, enhanced access to DCS/MPP/Milk Unions, greater dairy activities related income and empowerment, awareness on quality milk and scientific calf rearing practices, improved access to other dairy related government schemes, improved access to awareness programmes on animal health/ disease control/ silage production/ fodder conservation/safe milking | <ul style="list-style-type: none"> ■ Awareness on NDSP Phase-II Project, ■ Awareness on activities and likely; benefits focused on vulnerable groups under the Project, ■ Information on additional provision for enhancing participation of SC/ST farmers and entrepreneurs, ■ Awareness on eligibility criteria for accessing project support, ■ Awareness on trainings and capacity building opportunities available with Project, ■ Access to functional GRM for the Project, |

| S No | Specific Stakeholder | Likely impacts from Project investment | Specific Engagement/Information Needs |
|------|--|--|--|
| | | practices, access to community milking parlour etc. | <ul style="list-style-type: none"> Information on supplementary livelihood benefits for marginal/small farmers including SC/ST farmers under the Project. |
| 29 | Scheduled Tribe | Positive impact anticipated for ST community as well in terms of their increased participation in project, enhanced access to DCS/MPP/Milk Unions, greater dairy activities related income and empowerment, awareness on quality milk and scientific calf rearing practices, improved access to other dairy related government schemes, improved access to awareness programmes on animal health/ disease control/ silage production/ fodder conservation/safe milking practices, access to community milking parlour etc. | <ul style="list-style-type: none"> Awareness on NDSP Phase-II Project, Awareness on activities and likely benefits focused on vulnerable groups under the Project, Information on additional provision for enhancing participation of SC/ST farmers and entrepreneurs, Awareness on eligibility criteria for accessing project support, Awareness on trainings and capacity building opportunities available with project, Access to functional GRM for the Project, Information on supplementary livelihood benefits for marginal/small farmers including SC/ST farmers under the Project. |
| | Landless labours/small holder dairy farmers/Agriculture labourer | Enhanced opportunities for supplementary income, better access to dairy services, empowerment, additional measures for ensuring benefits to vulnerable groups, bring greater transparency, accountability, and social inclusion | <ul style="list-style-type: none"> Awareness on NDSP Phase-II Project, Awareness on activities and likely benefits focused on vulnerable groups under the Project, Awareness on eligibility criteria for accessing project support, Awareness on trainings and capacity building opportunities available with Project, Access to functional GRM for the Project, Information on supplementary livelihood benefits for marginal/small farmers under the Project, |
| | Dairy farmers with disabilities | Enhanced opportunities for supplementary income, doorstep access to dairy services, empowerment, bring greater transparency, accountability and social inclusion | <ul style="list-style-type: none"> Awareness on NDSP Phase-II Project benefits, Prior information and convenient option for taking part in training and capacity building program, Sensitisation of service providers for ensuring physical access to project support, Information on the scope for doorstep delivery of project services like distribution of feed, fodder, AI services etc. Access to functional GRM for the Project |

6.3 Grievance Redressal Mechanism for stakeholders

A grievance would usually mean some form of dissatisfaction by a stakeholder which needs to be redressed to continue smooth implementation of the Project. The Project will need a system for redressal of grievances that may arise during the course of its implementation. The GRM is to uphold

the Project's social and environmental performance designed to address concerns and complaints promptly and transparently with no direct or indirect retaliation on the aggrieved party. Grievances raised by stakeholders will need to be managed through a transparent process, readily acceptable to all stakeholders, at no cost and without any retribution. The GRM for the Project will work within the existing national and state's legal and cultural frameworks and will provide an additional opportunity to stakeholders and interested parties to resolve their specific grievances at the local, or state level.

The key objectives of this GRM will be:

- Ensure availability of offline as well as online mechanisms which are simple to use and accessible by all the categories of stakeholders and by people with differing levels of literacy and awareness,
- To record, categorize and prioritize the grievances,
- Redress grievances via consultation, information disclosure, action with all stakeholders based on the nature of grievances received,
- Inform the stakeholders about the action taken or information sought and ensure that the grievances are adequately addressed and resolved within a specified timeframe,
- Provide a system of escalation to the higher level of any grievance that remains unresolved or unaddressed within the stipulated timeframe, and
- Provide an appellate authority within the project management set-up for handling appeals on grievances perceived as being unresolved by the complainant.

The types of grievances by stakeholders may include, but are not limited to:

- Grievances raised by milk producers at DCS/MPP level such as demand for higher rate for milk, issues related regular milk collection, access to animal health related services, lack of access to existing dairy related schemes of state/central government etc.,
- Delay in delivery of the project benefits to target stakeholders or any other concerns w.r.t respective POIs,
- GBVH (Gender based violence & harassment) or any other kind discrimination related grievances being faced by target beneficiary or other stakeholders, and
- Customer's complaint regarding quality of milk and milk products being supplied by milk unions, etc.

In the Project DPR, it has been envisaged that NDDB and each POI would have a designated officer who will function as a 'Grievance Redressal Officer (GRO)' to deal with grievances. The list of GROs (Contact numbers/ mailing IDs and address) would be displayed on the web site of the NDDB and POIs and at other relevant locations. Further it is mentioned that GRO in the PMU (NDDB), will prepare a monthly report which will include reports to be obtained from the GROs of each POI. This report will be reviewed by the PSC (Project Steering Committee). Wherever required, the PSC will provide guidance on ways to dispose of grievances in an effective manner.

In addition to the proposed mechanism of designating a GRO, NDDB will and EIAs will need to define process of acknowledgment, recording, reporting/responding and escalation of grievances in case the aggrieved party is not satisfied with the action taken or grievances being left unattended.

Some of the POIs (like Madhya Pradesh Federation) have functional GRM system and disclosed in their website for their current operations. POIs will have the opportunity to align their existing formal or informal GRM system, provided they are properly designed and implemented, and deemed suitable for project purposes.

6.4 Disclosure of Project Information

NDDB has a fully functional website containing Suo motu disclosures of required information about the organization. All information regarding the Project details of the activity/ sub-activity, eligibility criteria

etc., will be provided on the NDDDB's website. Also, progress of the Project and the particulars of the contact person of NDDDB for seeking further information will also be provided on the website.

The draft ESMF along with other E&S instruments like draft SEP, will be disclosed by the NDDDB on its official website as well as in the official website of the concerned s, for seeking comments and feedback.

All information pertaining to the project will need to be provided by NDDDB and POIs to the stakeholders in the local/ official language according to the engagement strategy outlined in this plan.

7. ASSESSMENT OF POTENTIAL ENVIRONMENT AND SOCIAL IMPACTS AND RISKS

7.1 Introduction

The assessment of E&S risks and impacts focused on significant potential risks and impacts, and concerns associated with the implementation of the NDSP-II. The potential risks and impacts identified were based on the type and scale of the various project component, associated activities, inputs from stakeholders, and special insights from the consultants.

The potential beneficial and adverse risks and impacts likely to be associated with the proposed Project are presented in the following sections. Detailed methodology of impact assessment is provided in **Appendix F**.

7.2 Potential Impact Significance Determination

Once magnitude of potential impact and sensitivity/vulnerability/importance of resource/receptor have been characterized, the significance can be assigned for each potential impact. Potential impact/ risk significance is designated using the matrix shown in **Table 7.1**.

Table 7.1 Potential Impact/Risk Significance

| | | Sensitivity/ Vulnerability/ Importance of Resource/ Receptor | | |
|------------------------------|---------------|--|---------------|----------|
| | | Low | Medium | High |
| Magnitude of Negative impact | Insignificant | Insignificant | Insignificant | Minor |
| | Low | Insignificant | Minor | Moderate |
| | Medium | Minor | Moderate | Major |
| | High | Moderate | Major | Major |
| Magnitude of Positive impact | Insignificant | Insignificant | Insignificant | Minor |
| | Low | Insignificant | Minor | Moderate |
| | Medium | Minor | Moderate | Major |
| | High | Moderate | Major | Major |

7.3 Impact Identification

The impact identification process has been done for the Project activities and sub-activities to be taken under NDSP II, identifying their interaction with the environmental and social media. After the preliminary identification of the impacts through this process, the impacts for each of the social and environmental media were analyzed separately and are discussed in the next subsection.

| | | Land Env. | | Water Env. | | | Air Env. | | Noise | Transport | Ecology & biodiversity | | | | | Livelihood & employment | | | Gender | | | SC, ST & Vulnerable group | | | Access to Services | | | Labour | | | Health & safety | | Food safety & quality | | Energy | Land | | |
|-------|--|------------------|--------------|-----------------------|----------------------|-----------------------|-------------|--------------|---------------|----------------|-----------------------------|-------------------------|------------------------------|--------------------------|--------------------|-------------------------|----------------------------|---------------|-------------------------|-------------------------|---------------|---------------------------|-------------------------|---------------|----------------------------|----------------------|----------------|-------------------|-----------------|-----------|-----------------|--------------|---------------------------------|---------------|-------------------------------|---------------------------------|--|--|
| | | Land requirement | Soil quality | Ground water resource | Ground water quality | Surface water quality | Air quality | GHG emission | Noise quality | Road & traffic | Natural habitat terrestrial | Natural habitat aquatic | Modified habitat terrestrial | Modified habitat aquatic | Ecosystem Services | Sustainable Livelihood | Job & economic opportunity | Vulnerability | Employment & livelihood | Empowerment & Inclusion | Vulnerability | Employment & livelihood | Empowerment & Inclusion | Vulnerability | Infrastructure development | Training & awareness | Input services | Working condition | Wages & Payment | Migration | Community | Occupational | Quality of milk & milk products | Public health | Promotion of renewable energy | Land ownership & access to land | | |
| B.2.2 | Installation of booths/ parlours/ kiosks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.2.3 | Recruitment of sales professionals | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.2.4 | Brand Development Support to be provided at State Federation Level/Apex institutions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.2.5 | Training & Capability Enhancement Support to Sales & Marketing Manpower of POs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.3 | Enhancing Food Safety and Quality | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.3.1 | Milk quality Improvement Programme | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.3.2 | Dairy Plant Improvement Programme | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.3.3 | Introduction/up-gradation of Food Safety Management System) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.3.4 | Introduction of Other International Management | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B.3.5 | Strengthening dairy business operations through ICT support | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C. | Component C: Productivity Improvement and Enhancing Resilient Rearing Practices | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.1 | Promotion of Scientific Feeding Practices | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.1.1 | Ration Advisory Services | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.1.2 | Calf Rearing Programme (CRP) for buffalo & cow calves | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.1.3 | Village level producers' institutions based TMR Plant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.2 | Demonstration of Fodder Production & Conservation Technology | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.2.1 | Setting up of Fodder Seed Processing Plant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.2.2 | Demonstration of Green Fodder Conservation Technologies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.2.3 | Demonstration of community level | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | Land Env. | | Water Env. | | | Air Env. | | Noise | Transport | Ecology & biodiversity | | | | | Livelihood & employment | | | Gender | | | SC, ST & Vulnerable group | | | Access to Services | | | Labour | | | Health & safety | | Food safety & quality | | Energy | Land | | | | | | | | | | | | | | | | | | | |
|---|--|------------------|--------------|-----------------------|----------------------|-----------------------|-------------|--------------|---------------|----------------|-----------------------------|-------------------------|------------------------------|--------------------------|--------------------|-------------------------|----------------------------|---------------|-------------------------|-------------------------|---------------|---------------------------|-------------------------|---------------|----------------------------|----------------------|----------------|-------------------|-----------------|-----------|-----------------|--------------|---------------------------------|---------------|-------------------------------|---------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | Land requirement | Soil quality | Ground water resource | Ground water quality | Surface water quality | Air quality | GHG emission | Noise quality | Road & traffic | Natural habitat terrestrial | Natural habitat aquatic | Modified habitat terrestrial | Modified habitat aquatic | Ecosystem Services | Sustainable Livelihood | Job & economic opportunity | Vulnerability | Employment & livelihood | Empowerment & Inclusion | Vulnerability | Employment & livelihood | Empowerment & Inclusion | Vulnerability | Infrastructure development | Training & awareness | Input services | Working condition | Wages & Payment | Migration | Community | Occupational | Quality of milk & milk products | Public health | Promotion of renewable energy | Land ownership & access to land | | | | | | | | | | | | | | | | | | | |
| | green fodder production | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.2.4 | Demonstration of Biomass Management Technologies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.2.5 | Pilot on Mobile Fodder Seed Processing Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.3 Pilot on control of Bovine Mastitis & EVM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.3.1 | Pilot on control of Bovine Mastitis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.3.2 | Pilot on propagation of Ethno-Veterinary Medicine (EVM) for bovine ailments | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.4 Manure Value Chain Development Programme | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.4.1 | Establishing Gobar gas Clusters | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.4.2 | Pilot on establishing slurry processing centres | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.5 Pilot on Solar Energy solution for dairy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.5.1 | Pilot on Rooftop Solar PV System at DCS/MMP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.5.2 | Pilot on Augmentation of BMC with solar powered instant milk chiller | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.6 Pilot on evolving Green House Gas (GHG) mitigation Strategies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.6.1 | Pilot on measurement of Methane emissions in Progeny Testing (PT) projects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.6.2 | Pilot on development of feed additives for methane mitigation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C.6.3 | Climate Smart Dairying – Pilot on evolving mitigation strategies for Carbon Foot print of dairy sector | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D. Component D: Project Management and Learning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D.1 | Establishment, operation and management of computerised MIS at NDDDB and POIs level | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

7.4 Environmental, Health & Safety Risks and Impacts

The potential risks and impacts from the Project and sub-components (of NDSP-II) identified in Table 7.2 are summarized in Table 7.3 as following.

Table 7.3 Summary of Identified E&S Risks and Impacts of NDSP-II

| S. No | Risk category | Description of Identified Risks and Impacts |
|-------|---|---|
| 1 | Land resource | Land procurement (direct purchase/lease) from Scheduled Caste community members / forest land/ required economic and physical displacement. |
| 2 | Ground water resource | Large quantum of water required project sourced from critical, over-exploited. |
| 3 | Surface water quality | Discharge of large volume of untreated wastewater into surface water bodies (river/ stream/ lake/ ponds, etc). |
| 4 | Soil and ground water quality | Spillage of hazardous materials/ hazardous waste/ bio-medical waste on open soil or dumping of these materials in non-designated area; |
| 5 | Road & traffic | Movement Project vehicles on narrow and congested village road passing through densely populated settlement/ religious places/ educational facilities/ health facilities. |
| 6 | GHG emission | Emission of GHG from enteric fermentation, manure management and burning of fossil fuel (light diesel oil), electricity used for dairy processing units and transportation of milk and milk products. |
| 7 | Community health and safety | Location of community milking centre in proximity to densely populated area. Improper disposal of waste and wastewater causes borne diseases and odour. Transportation of milk and milk product through congested road. |
| 8 | Occupational health and safety | Ignorance about site specific hazards may pose a potential threat to health and safety of the workforce. Lack of Personal Protection Equipment (PPE) during construction/ operational work may pose risk to worker health and safety |
| 9 | Labour and working condition | Lack of adequate facilities at the work site and at the labour accommodation (space, water, sanitation, fire safety, first-aid, periodic health check-up, etc.) can pose pollution risk to the workforce |
| 10 | Ecology and biodiversity | Project-sub activity located in proximity of natural forest/ wildlife sanctuary/ national park/ eco-sensitive zone. Discharge of untreated wastewater in surface water bodies, which have important habitat for protected species/fisheries. |
| 11 | Gender vulnerability | Exclusion or non-participation of women from the institutional capacity building acidity. |
| 12 | SC, ST, and other vulnerable groups vulnerability | Exclusion or non-participation of SC, ST, and other vulnerable groups from the institutional capacity building acidity. |
| 13 | Livelihood & employment vulnerability: | Not providing the livelihood and employment opportunities to the small-scale dairy farmers, vulnerable section of societies. |

7.5 Impact/ Risk Assessment

The impacts identified in Section 7.3 have been detailed in this sub-section. The impacts have been classified first under components, and then the sub-components that are likely to trigger the impacts have been mentioned. This has been done as some of the impacts are likely to get triggered owing to activities proposed under more than one sub-component. The environmental and social impacts are jointly clubbed under the components to establish clarity based on the components under which they fall. In the following section, only moderate and major impacts have been discussed, and mitigation measures thereof are provided.

The ESMF (Refer to **Table 7.4**) also does the impact categorization based on the impact assessment criteria earlier discussed. Further, ESMF details out the mitigation and enhancement measures that have already been incorporated into the project design and then suggests the additional mitigation and enhancement measures that will be required over and above the Project design. The implementation schedule for each of the suggested measures along with the primary responsibility for implementation, is also incorporated into the ESMF.

Table 7.4 Environmental and Social Management Framework

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|-----------|---|---|--|--|-----------------------------------|----------------|--|
| A. | Component A: Enhancing Institutional Capacity and Sustainability | | | | | | |
| A.1 | Institutional capacity building | | | | | | |
| A.1.1 | Dairy Cooperative Society (DCS) level capacity building | The sub-component has potential to increase training and awareness of people about the roles and responsibilities of DCSs, an understanding of business development plans, and brand building, which ultimately leads to enhanced capacity building in the targeted states. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Need assessment shall be done prior to any training programme, Identify the Management Committee Members (MCM) of village level institutions for training, Training program shall include women, SC, ST and vulnerable group members. | Planning and implementation stage | PMU | Number of DCSs trained on animal rearing and dairying; |
| | | The non-involvement of women, SC, ST, and other vulnerable groups in the proposed capacity-building programme has the potential to have a negative impact on their vulnerability (gender, SC, ST, and vulnerable group) . | Negative impact <i>Magnitude- small</i> <i>Sensitivity- High</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Prioritising the use of women, SC, ST, and other vulnerable groups to be selected in the training and capacity building programme, Supervise the selection programme, The grievance mechanism should be accessible to all villagers to report concerns associated with vulnerability and sexual exploitation, abuse, and harassment, as well as any other concerns (if any), Implement the Gender Based Violence Action Plan (Refer to Appendix H) | Planning and implementation stage | PMU | Number of grievances. |
| A.1.2 | Milk Union Level capacity building | The sub-component has potential to increase training and awareness of people about the roles and responsibilities of Milk Unions, about the new developments in the dairy sector, milk marketing, governance, etc., which will enhance the business of the POIs and assure continued producer-member relations. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | Refer to A.1.1 | Planning and implementation stage | PMU & POIs | Number of POI personnel comes under training and capacity building program Number of women, SC, ST and vulnerable members trained |
| | | The non-involvement of women, SC, ST, and other vulnerable groups in the proposed capacity-building programme has the potential to have a negative impact on their vulnerability (gender, SC, ST, and vulnerable group) . | Negative impact <i>Magnitude- small</i> <i>Sensitivity- High</i> <i>Significance- Moderate</i> | Refer to A.1.1 | Planning and implementation stage | PMU & POIs | Number of grievances. |
| A.1.3 | Farmer level capacity building | The sub-component has potential to increase the training and awareness of people to build capacity among the milk producers about (i) their roles and responsibilities as cooperative members; (ii) scientific breeding, feeding, and management to enhance productivity; and (iii) clean milk production at the farm and DCS level. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The training programme will be imparted to new or revived DCS in the project area, A need assessment shall be done prior to any training programme, POIs shall include 50% of women, and programmes shall include women, SC, ST, and vulnerable group members in each participating group, The number of training programmes and targeted milk producers in CMP and DCS targeted in the project shall be achieved, Regular follow up of the training programmes could be done to ensure that the farmers are able to implement the learning's on | Planning and implementation stage | PMU & POIs | Number of new or revived Milk Unions comes under training and capacity building program |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|---------|----------------------------|--|--|--|-----------------------------------|----------------|---|
| | | | | their own dairy farms. Alternate information and service delivery channels (like Milk supervisors, capacity building teams etc.) could be used for the follow up, | | | |
| | | The training on breeding, feeding, and management has the potential to enhance the sustainable livelihood of the milk producer through an increase in milk production. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Milk producers could be provided guidance on how to invest their increased incomes from dairying and also avail value added services like cattle insurance, etc., The SC/ST HHs and other vulnerable populations could be identified for specific training related to forming saving groups. The income generated by dairying could be used to further strengthen the resource base and diversify the income source. | Project implementation stage | PMU and POIs | Number of new milk producers comes under Milk Union and received training |
| | | The non-involvement of women, SC, ST, and other vulnerable groups in the proposed capacity-building programme has the potential to have a negative impact on their vulnerability (gender, SC, ST, and vulnerable group) . | Negative impact <i>Magnitude- small</i> <i>Sensitivity- High</i> <i>Significance- Moderate</i> | Refer to A.1.1 | Planning and implementation stage | PMU & POIs | Number of grievances. |
| | | Increased awareness among milk producers at the household level to enhance the quality of milk and milk products and public health . The clean milk production activities at the farm and DCS level will provide quality milk and milk products to consumers, which will have a positive impact on public health. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Clean milk production practices (milking, storage, and transportation) at the dairy farm level, Better shelter management practices resulting in increased hygiene for the dairy animals and reduced chances of infection for the cattle, Waste management (animal dung and feed wastes) aspects. Pilot programme on waste management would be taken as part of the project, IEC campaigns could include publishing literature materials, pamphlets, and other audio-visual aids (in local language), Implement the waste management procedure (Refer to Appendix G). | Project implementation stage | PMU and POIs | Pre and post training awareness generation |
| | | The farmers level capacity building activities have potential to increase women's empowerment & inclusion through engagement and increased participation in dairy-based livelihood activities | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- High</i> <i>Significance- Major</i> | <p>To ensure that women participation is increased under the project, following measures could be taken for the enhancement of the impact:</p> <ul style="list-style-type: none"> Number of women accessing project services and benefits be recorded with the objective that this participation level should show an upward trend through the project's implementation, Women's active participation in milk unions and on boards is to be monitored. Issues seen as constraints and obstacles to be removed by the IA through consultations with them and other union members, Participation of women in training programmes is to be ensured through appropriate design, location, and timing choices to suit their requirements, The training and IEC programmes should focus on the maintenance requirements of (i) ration advisory services, (ii) scientific calves rearing training, and (iii) clean milk production so that people can make informed choices, Proposed training programmes to include gender sensitization of milk producers and unions to reduce the incidence of discrimination and harassment that women face while participating, | Project implementation stage | PMU and POIs | Number of women accessing project services and benefits. |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
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| | | | | <ul style="list-style-type: none"> The training programmes are to include information and details on ensuring fair and transparent village level procurement and payment processes, Equal access to women and other poor or vulnerable groups to avail of employment opportunities generated through service delivery training (like POI, and other resource persons), Implement the Gender and Social Inclusion Action Plan (GSIA)- refer to Appendix H. | | | |
| | | The farmers level capacity building activities have potential to increase the empowerment and inclusion of SC, ST, and vulnerable groups through engagement and increased participation in dairy-based livelihood activities | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- High</i> <i>Significance- Major</i> | <ul style="list-style-type: none"> Customised training programmes will be organised to assist SC/ST and others in obtaining project benefits, Ensure adequate representation of SC/ST participants in all the training batches, The number of SC/ST HHs and other vulnerable populations accessing project services and benefits should be recorded with the objective that this participation level should show an upward trend through the project's implementation, The project will develop a database on the membership and representation of women, SC/STs, and other vulnerable groups in the village-level institutions, The project will monitor the participation of SC/ST HHs and other vulnerable populations in milk unions and on boards, Efforts could be made to dovetail dairy related government schemes for the SC/ST families to encourage their participation in dairying, Specific IEC will be planned and implemented to raise general awareness of dairying and improve practises, and Implement the Indigenous People Policy Framework (IPPF), refer to Appendix I. | Project implementation stage | PMU and POIs | Number of women accessing project services and benefits. |
| A.2 | Human Resource Development | | | | | | |
| A.2.1 | Deployment of Lady Extension Officer (LEO) | Potential to increase the employment and livelihood of women's groups through the deployment of lady extension officers (LEO) under this project. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- High</i> <i>Significance- Major</i> | <ul style="list-style-type: none"> Provide and communicate clear information about the Project's requirement related to job/employment and business opportunities and provide priority to local women including SC, ST, and other vulnerable groups, Supervise the recruitment process by the contractor in accordance with Stakeholder Engagement Procedure, The grievance mechanism should be accessible to all villagers to report concerns associated with job and business opportunities as well as other concerns (if any). An immediate investigation will be undertaken for all submitted grievances, Implement the Stakeholder Engagement Plan (SEP); | Project implementation stage | PMU & POIs | No. of women members recruited under this Project |
| | | In the proposed deployment of LEO, non-involvement of SC, ST, and other vulnerable groups has the potential to have a negative impact on vulnerability. | Negative impact <i>Magnitude- Small</i> <i>Sensitivity- High</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Prioritising the engagement of SC, ST, and other vulnerable groups to be selected for LEO, Supervise the selection programme, The grievance mechanism should be accessible to all villagers to report concerns associated with LEO recruitment and harassment as well as any other concerns, Implement the Indigenous People Policy framework (IPPF); refer to Appendix I. | Planning and implementation stage | PMU & POIs | Number of grievances. |
| A.3 | Adoption of Technology | | | | | | |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|---------|---|--|---|---|------------------------------|----------------|---|
| A.3.1 | Strengthening of Training Centres | Potential to enhance the Infrastructure development in the existing training centres at DCS/ BMC, Milk Union and Federation level. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor</i> | <ul style="list-style-type: none"> Need assessment shall be done prior to selection of Strengthening of Training Centres, Develop the mechanism for its operation maintenance fund by the DCS/ BMC, Milk Union and Federation | Project implementation stage | PMU & POIs | Number of training centre is improved under this project. |
| B. | Component B: Strengthening Dairy Market Development | | | | | | |
| B.1 | Strengthening the dairy Supply Chain System | | | | | | |
| B.1.1 | Expansion of village coverage | From the primary survey, it is revealed that all the milk producing villages do not have milk collection centre. Under this project the support will be provided for setting up village level institutions including includes milk collection accessories. This intervention will enhance the Infrastructure development in the village level. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Identify the milk producing villages that do not have DCS. Have their own or rented house for the establishment of new DCS/MPP. Develop the mechanism for self-sustaining operation and maintenance of the facility. Develop the mechanism for inclusion of villages willing to be part of the expansion activity. | Project implementation stage | PMU & POIs | Number of new DCS/MPP formed under this project. |
| | | The expansion of village coverage will encourage to enhance the milk production, especially small and medium dairy farmers, this will ultimately lead to enhance the sustainable livelihood . | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | Refer to B.1.1 | Refer to B.1.1 | Refer to B.1.1 | Refer to B.1.1 |
| | | Reduced migration in communities where lack of supplemental income sources during non- agricultural seasons forces households to migrate for work | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | Refer to B.1.1 | Refer to B.1.1 | Refer to B.1.1 | Refer to B.1.1 |
| B.1.2 | Strengthening village level milk chilling infrastructures | From the primary survey, it is revealed that all the DCS/MPP do not have the bulk milk cooler (BMC). Under this project, support will be provided for setting up BMC. This intervention will enhance the infrastructure development at the DCS/MPP level. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Identify the DCS/MPP that does not have the BMC. Develop the mechanism for self-sustaining operation and maintenance of the facility.. | Project implementation stage | PMU & POIs | Number of BMC constructed in DCS/MPP formed under this project. |
| | | The operation of BMC would require water for cleaning – two times in day and average consumption of water is 80-100 liter per day. Water is being sourced from ground water. Increase number of BMC would require additional ground water resources. If the BMC is located in the ground water stressed area (over exploited/ critical area), potential to impact on ground water resources . | Negative impact <i>Magnitude- Small/ Medium</i> <i>Sensitivity- Low/ medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> For withdrawal of ground water for BMC, DCS/MPP shall obtain NOC for concerned authority. DCS/MPP can install rooftop rainwater harvesting and ground water recharge system. Implement the resource conservation strategy; Refer to Appendix J. | Project implementation stage | DCS/MPP | Number of BMC initiated water conservation measures |
| | | The increase of villages based milk collection facility, potential to increased vehicle trips for milk collection. This may potential impact on rural road and traffic . | Negative impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> | <ul style="list-style-type: none"> The location of BMCs could be determined based on route planning analysis with an objective to reduce vehicular trip requirement. | Project implementation stage | DCS/MPP | Selection of vehicular access road. |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
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| | | The increased vehicular movement may cause vehicular pollution. | <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Awareness program could be conducted for driver and helpers to promote awareness on defensive driving techniques and road safety behavioural issues. Transport fleet contracted by dairy societies, unions and federations could be maintained in good condition to improve fuel efficiency and pollution emission parameters. Periodic pollution check-up and fuel efficiency could be made mandatory as part of contract conditions, Dairy societies, unions and federations Milk transportation could stipulate that the contracted fleet should not have vehicles that are more than 15 years old or as per prevailing national regulations, Implement Traffic Management Plan; Refer to Appendix K. | | | Vehicles PUC checking system |
| B.1.3 | Provision of village level milk testing equipment | From the primary survey, it is revealed that 60-70 of DCS/MPP are equipped with electronic milk testing equipment such as AMCU/DPMCU. Under this NDSP-II Project the remaining DCS/MPP and new DCS will have AMCU/DPMCU. This intervention will enhance the infrastructure development in the DCS/MPP level. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor</i> | <ul style="list-style-type: none"> Identify the DCS/MPP that do not have the AMCU/DPMCU. Implement the testing facility in all AMCU/DPMCU as per sub-project plan. | Project implementation stage | PMU & POIs | Number of AMCU/ DPMCU. installed testing equipments under this project. |
| B.1.4 | Milk Adulterant and testing equipment at BMC Level | Potential to enhance the Infrastructure development through installation of milk adulteration testing equipment at BMC location. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor</i> | <ul style="list-style-type: none"> Identify the DCS/MPP do not have the AMCU/DPMCU. Implement the testing facility as per sub-project plan. | Project implementation stage | PMU & POIs | Number of BMC installed in testing equipment under this project. |
| | | The installation of milk adulteration testing equipment at BMC location will ultimately ensure the quality of milk as well as nutritional value. This intervention will have potential to enhance the quality of milk & milk products and public health . | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The project shall install electronic milk adulteration testing equipment in all the BMC | Project implementation stage | PMU & POIs | Pre and post training awareness generation |
| B.1.5 | Community Milking Centres | To set up a community milking centres (CMC), it would require land. The requirement of land depends upon size of the CMC. Land procurement (direct purchase/ lease) for the proposed sub-project may affect the land based livelihood of landowners and land users , if it is set-up on private land and on land of ST communities. | Negative impact <i>Magnitude- Medium</i> <i>Sensitivity- Low/ Medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> The Project will not finance any activity that entails land acquisition, The Project will not finance any direct purchase of land. The IA has to provide evidence that any land required and available with it, is free of any encumbrances, In case there is direct purchase of land by POI, such sale deed will be based on prevailing market rates and verifiable, The PMU as a part of monitoring will ensure that the land being made available for the sub project implementation is encumbrance free, Project should avoid the land procurement (direct purchase/ lease) from Scheduled Caste community members, Project should avoid the land transaction (direct purchase/ lease) for non-domicile individual or agency, Project should avoid the land procurement (direct purchase/lease), where physical displacement will require. | Project implementation stage | PMU & POIs | Number of Project affected people and compensation provided |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
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| | | | | <ul style="list-style-type: none"> Project should implement the Resettlement Policy Framework (RPF)- refer to Appendix L. | | | |
| | | The operation of CMC would require water for cleaning. Water likely to be sourced from the ground water. If the CMC is located in the ground water stressed area (over exploited/ critical area), potential to impact on ground water resources. | Negative impact <i>Magnitude- Small/ Medium</i> <i>Sensitivity- Low/ medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> For withdrawal of ground water for BMC, DCS/MPP shall obtain NOC for concerned authority. DCS/MPP can install rooftop rainwater harvesting and ground water recharge system. Implement the Resource Conservation Strategy (refer to Appendix J). | Project implementation stage | DCS/MPP | Number of CMC having water conservation initiatives |
| | | Setting up of CMC in modified habitat (waste land/ scrub land) may have impact on natural/ modified terrestrial habitat and ecological services. Again, discharge of untreated surface wastewater in surface water body may have impact on natural/ modified aquatic habitat. | Negative impact <i>Magnitude- small</i> <i>Sensitivity- Low/Medium</i> <i>Significance- Minor/Moderate</i> | <ul style="list-style-type: none"> The CMC should be set up in developed land and away from surface water body, Wastewater treatment as suggested above; Implement the Biodiversity Management Framework - refer to Appendix M. | Project implementation stage | PMU & POIs | Location of CMC in any modified/ natural ecological habitat, Wastewater treatment system installed or not |
| | | During construction period of CMC, potential to create job (construction labourer) and economic opportunity (supply of civil construction materials). During operation phase, workforce will be required for the operation and maintenance of CMC; which have potential positive impact on Job & economic opportunities. | Positive impact <i>Magnitude- Small/ Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> Provide and communicate clear information about the Project's requirement related to job/employment opportunities and provide priority to locals where feasible. Prioritising use of local workforce, especially the unskilled and semi-skilled workers to be employed, subject to meeting the requirements; Supervise the recruitment process by the contractor in accordance with Stakeholder Engagement Procedure. Conduct due diligence of the local suppliers to identify and evaluate the quality of services and products provided by local suppliers in line with the required standards. The grievance mechanism should be accessible to all villagers to report concerns associated with job and business opportunities as well as other concerns (if any). An immediate investigation will be undertaken for all submitted grievances. Implement Stakeholder Engagement Plan (SEP), | Project implementation stage | PMU & POIs | Number of local people got the job & economic opportunities from the project. |
| B.1.6 | Milk Tanker based milk measurement and sampling system | The installation of milk tanker based milk measurement and sampling system will ultimately ensure the quality of milk as well as nutritional value. This intervention will potential to enhance the quality of milk & milk products and public health. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The Project shall install Milk Tanker based milk measurement and sampling system. | Project implementation stage | PMU & POIs | Number of tankers installed in testing equipment under this project. |
| B.1.7 | Installation of AMCS solution at DCS/MPP | The installation of the AMCS solution helps bring in transparency in milk procurement at the village level by catering to all the operational needs of a DCS or MPP, which will lead to infrastructure development so that milk producers will benefit. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The project shall install AMCS solution at DCS/MPP. | Project implementation stage | PMU & POIs | Number of DCS/ MPP installed AMCS under this project. |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
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| B.1.8 | Village level Milk Pasteurization and Product Manufacturing | To set up village level milk pasteurization unit would require land. Land procurement (direct purchase/ lease) for the proposed sub-project may affect the land based livelihood of land owners and land users if is set-up in private land, land of ST communities. | Negative impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Refer to B.1.5 | Project implementation stage | PMU & POIs | Refer to B.1.5 |
| | | The operation of Milk Pasteurization and Product Manufacturing units would require water. Water is being sourced from ground water. Increase number of Milk Pasteurization and Product Manufacturing units would require additional ground water resources. If these units are located in the ground water stressed area (over exploited/ critical area), potential to impact on ground water resources . | Negative impact <i>Magnitude- Small/ Medium</i> <i>Sensitivity- Low/ medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> For withdrawal of ground water for BMC, DCS/MPP shall obtain NOC for concerned authority. DCS/MPP can install rooftop rainwater harvesting and ground water recharge system. Implement Resource Conservation Strategy - refer to Appendix J. | Project implementation stage | DCS/MPP | Number of BMC having water conservation initiatives |
| | | Setting up of Milk Pasteurization and Product Manufacturing units in modified habitat (waste land/ scrub land) may have impact on natural/ modified terrestrial habitat and ecological services. Discharge of untreated wastewater into surface water body may have impact on natural/ modified aquatic habitat . | Negative impact <i>Magnitude- small</i> <i>Sensitivity- Low/ Medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> The Milk Pasteurization and Product Manufacturing units should be set up in developed land and away from surface water body; Wastewater treatment as suggested above. Implement Biodiversity Management Framework, refer to Appendix M. | Project implementation stage | PMU & POIs | Increase the demand of ration balance feed |
| | | During construction period of CMC, potential to create job (construction labourer) and economic opportunity (supply of civil construction materials). During operation phase, workforce will be required for the operation and maintenance of CMC; which have potential positive impact on Job & economic opportunities . | Positive impact <i>Magnitude- Small/ Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> Refer to B1.5 | Project implementation stage | PMU & POIs | Refer to B1.5 |
| B.1.9 | Clean Milk Production (CMP) programme for milk producer members | Increased awareness among milk producers on household level to enhance the quality of milk & milk products and public health. The clean milk production at farm and DCS level activity will provide quality milk and milk product to the consumers, which will lead to positive impact on public health. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Refer to A.1.3 | Project implementation stage | PMU & POIs | Refer to A.1.3 |
| B.2 | Strengthening the Sales and Marketing System | | | | | | |
| B.2.1 | Provision of Visi-cooler, Chest coolers, Deep freezers, Instant Ice cream making units/ Softy Machines | During construction period of CMC, potential to create job (construction | Positive impact <i>Magnitude- Small/ Medium</i> | <ul style="list-style-type: none"> Provide and communicate clear information about the Project's requirement related to job/employment and business opportunities and provide priority to locals where feasible. | Project implementation stage | PMU & POIs | Number of local people benefited from the project. |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
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| B.2.2 | Installation of booths/ parlours/ kiosks | <p>labourer) and economic opportunity (supply of civil construction materials).</p> <p>During operation phase, Recruitment of sales professionals to spearhead all sales & marketing activities of POIs; which have potential positive impact on Job & economic opportunities.</p> | <p><i>Sensitivity- Low</i> <i>Significance- Minor/ Moderate</i></p> | <ul style="list-style-type: none"> Prioritising use of local workforce, especially the unskilled and semi-skilled workers to be employed, subject to meeting the requirements; Supervise the recruitment process by the contractor in accordance with Stakeholder Engagement Procedure. Conduct due diligence of the local suppliers to identify and evaluate the quality of services and products provided by local suppliers in line with the required standards. The grievance mechanism should be accessible to all villagers to report concerns associated with job and business opportunities as well as other concerns (if any). An immediate investigation will be undertaken for all submitted grievances. | | | |
| | | <p>Potential to increased awareness and capacity building of the POI members about in sync with emerging market trends, Market Competition, SND Techniques, Sales Planning & Monitoring, e-commerce applications, GPS enabled supply solutions for Route optimisation, sales proceeds remittance and delivery systems</p> | <p>Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i></p> | <ul style="list-style-type: none"> The training programme will be imparted to new or revived DCS in the project area, Need assessment shall be done prior to any training programme, POIs shall include 50% of women, program shall include women, SC, ST and vulnerable group members in each participating group. | <p>Planning and implementation stage</p> | <p>PMU & POIs</p> | <p>Number of new or revived DCSs installed. Visi-cooler, Chest coolers, Deep freezers, Instant Ice cream making units</p> |
| B.2.4 | Brand Development Support to be provided at State Federation Level/Apex institutions | Potential to enhance the sustainable livelihood through the brand development and training and capacity building for sales and marketing | <p>Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i></p> | <ul style="list-style-type: none"> Brand Development Support to be provided at State Federation Level/Apex institutions who are the custodian of the brand, Support will also be extended in execution/ Ground level implementation of Branding & Advertising activities. | <p>Project implementation stage</p> | <p>PMU & POIs</p> | <p>Any new branding promoted under this project.</p> |
| B.2.5 | Training & Capability Enhancement Support to Sales & Marketing Manpower of POIs | Potential to increased awareness and capacity building of sales and marketing | <p>Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i></p> | <ul style="list-style-type: none"> Need assessment shall be done prior to any training programme, EIAs shall include 50% of women, program shall include women, SC, ST, and vulnerable group members in each participating group. Regular follow up of the training programmes could be done to ensure that the farmers are able to implement the learning's on their own dairy farms. Alternate information and service delivery channels (like Milk supervisors, capacity building teams etc.) could be used for the follow up. | <p>Planning and implementation stage</p> | <p>PMU & POIs</p> | <p>Number of new or revived DCSs comes under training and capacity building program.</p> <p>Participation of women, SC, ST, and vulnerable members</p> |
| B.3 | Enhancing Food Safety and Quality | | | | | | |
| B.3.1 | Milk quality Improvement Programme | Increased awareness among milk producers on household level to enhance the quality of milk & milk products and public health . The clean milk production at farm and DCS level activity will provide quality milk and milk product to the consumers, which will lead to positive impact on public health. | <p>Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i></p> | <ul style="list-style-type: none"> Refer to A.1.3 (a) | <p>Refer to A.1.3 (a)</p> | <p>Refer to A.1.3 (a)</p> | <p>Refer to A.1.3 (a)</p> |
| B.3.2 | Dairy Plant Improvement Programme | The operation of Dairy Plant would require water for vessels cleaning and floor washing. Water likely to be sourced from the ground water. If the CMC is located in | <p>Negative impact <i>Magnitude- Small/ Medium</i></p> | <ul style="list-style-type: none"> For withdrawal of ground water for dairy plant shall obtain NOC for concerned authority. Dairy plant can install rooftop rainwater harvesting and ground water recharge system. | <p>Project implementation stage</p> | <p>Dairy plant</p> | <p>Daily Water consumption Water conservation measures</p> |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|---------|--|--|--|---|------------------------------|----------------|---|
| | | the ground water stressed area (over exploited/ critical area), potential to impact on ground water resources . | <i>Sensitivity- Low/ medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> ETP treated wastewater can be used for floor washing purpose. Implement resource conservation strategy; Refer to Appendix J. | | | |
| | | During operational of Dairy Plant, wastewater in the form of wash water would be generated. If the wastewater discharged without proper treatment into nearby surface water body, water quality will be degraded due to high BOD load. Discharge of untreated wastewater in the surface water body (natural/ modified) may impact on natural and modified aquatic habitat. | Negative impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Wastewater should be treated through ETP and meet the discharge standard. Implement wastewater management plan; Refer to Appendix N | Project implementation stage | Dairy plant | Treated water quality |
| B.3.3 | Introduction/up-gradation of Food Safety Management System (FSMS) (ISO 22000/ FSSC 22000 and/or Quality Mark/ CAS MMP) | Improvement of dairy plant will ultimately ensure the quality of milk as well as nutritional value. This intervention will potential to enhance the quality of milk & milk products and public health. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | Certification and compliance of Management System | Project implementation stage | Dairy plant | Annual audit of management system |
| B.3.4 | Introduction of Other International Management Systems (ISO 14001/ ISO 50001/ ISO 45001/ IMS) | Improvement of dairy plant will ultimately ensure the quality of milk as well as nutritional value. This intervention will potential to enhance the quality of milk & milk products and public health. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | Certification and compliance of Management System | Project implementation stage | Dairy plant | Annual audit of management system |
| C. | Component C: Productivity Improvement and Enhancing Resilient Rearing Practices | | | | | | |
| C.1 | Promotion of Scientific Feeding Practices | | | | | | |
| C.1.1 | Ration Advisory Services | Potential to enhance the sustainable livelihood of the milk producer through increase of milk production from the Ration Advisory Services (RAS) i.e., "Pashu Poshan". Again, this will reduce the feed among and cost of feeding. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The SC/ST HHs and other vulnerable population could be identified for specific training and support from Ration advisories (RAS). | Project implementation stage | PMU & POIs | Number of SC/ ST other vulnerable population engaged under this sub-project |
| | | Potential to reduce the GHG emission in decreasing enteric methane emission substantially | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | The following mitigation measures shall be adopted to enhance the coverage of RAS and decrease the GHG emission. <ul style="list-style-type: none"> Sensitise the farmers to use the RAS; The project shall gradually increase the coverage of RAS. | | PMU & POIs | Number of new milk producers comes under Milk Union |
| | | Engagement of field supervisor from outside and non-involvement of women, SC, ST, and other vulnerable groups during the construction and operational stages of the project have the potential to have a negative impact on socio-economic conflict (Vulnerability). | Negative impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Prioritising use of local workforce, including women, SC, ST and other vulnerable group to be employed, subject to meeting the requirements; Supervise the recruitment process by the contractor in accordance with Stakeholder Engagement Procedure. The grievance mechanism should be accessible to all villagers to report concerns associated with job and business | Project implementation stage | PMU & POIs | Number of grievances. |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|---------|---|--|---|--|------------------------------|----------------|---|
| | | | | opportunities as well as other concerns (if any). An immediate investigation will be undertaken for all submitted grievances. <ul style="list-style-type: none"> Implement Stakeholder Engagement Plan (SEP). | | | |
| C.1.2 | Calf Rearing Programme (CRP) for buffalo & cow calves | To set up CRP would require land. Land procurement (direct purchase/ lease) for the proposed sub-project may affect the land based livelihood of land owners and land users if is set-up in private land, land of ST communities. | Negative impact Scale- Small Magnitude- Medium Sensitivity- Medium Significance- Moderate | <ul style="list-style-type: none"> Refer to B.1.5 | Project implementation stage | PMU & POIs | Ref. B.1.5 |
| | | The operation of CRP would require water for cleaning. Water likely to be sourced from the ground water. If the CRP is located in the ground water stressed area (over exploited/ critical area), potential to impact on ground water resources. | Negative impact Magnitude- Small/ Medium Sensitivity- Low/ medium Significance- Minor/ Moderate | <ul style="list-style-type: none"> For withdrawal of ground water for unit IA shall obtain NOC for concerned authority. IA can install rooftop rainwater harvesting and ground water recharge system. | Project implementation stage | DCS/MPP | Number of CRP having water conservation initiatives |
| | | During operational of CRP, wastewater in the form of wash water would be generated. If the wastewater discharged without proper treatment into nearby surface water body, water quality will be degraded due to high BOD load. During operational stage solid waste like feed waste, shed swiping waste, cow dung and urine will be generated. If these waste are not properly managed, may have potential impact on community health to the nearby settlement. | Negative impact Duration- Long term Extent- Local Scale- Small Magnitude- Small Sensitivity- Medium Significance- Minor | <ul style="list-style-type: none"> Cow dung can be used for biogas plant, The slurry generated from the CMC shall be treated in slurry treatment plant and after treatment- this can be used as manure. CRP site should be away from the settlement and surface water body, The shed should have proper ventilation system. Implement wastewater management plan (refer to Appendix G) | Project implementation stage | POIs | Solid waste and waste water treatment facility in the CRP |
| | | Setting up of CRP in modified habitat (waste land/ scrub land) may have impact on natural/ modified terrestrial habitat and ecological services. Discharge of untreated wastewater into surface water body may have impact on natural/ modified aquatic habitat. | Negative impact Magnitude- small Sensitivity- Low/ Medium Significance- Minor/ Moderate | <ul style="list-style-type: none"> The CRP should be set up in developed land and away from surface water body, Wastewater treatment as suggested above; Implement Biodiversity Management Framework, Refer Appendix M. | Project implementation stage | PMU & POIs | Location of CRP |
| C.1.3 | Village level producers' institutions based TMR Plant | To set up TMR plant would require land. Land procurement (direct purchase/ lease) for the proposed sub-project may affect the land based livelihood of land owners and land users if is set-up in private land, land of ST communities. | Negative impact Magnitude- Medium Sensitivity- Medium Significance- Moderate | <ul style="list-style-type: none"> Refer to B.1.5 | Project implementation stage | PMU & POIs | Refer to B.1.5 |
| | | Setting up of TMR plant in modified habitat (waste land/ scrub land) may have impact on natural/ modified terrestrial habitat and ecological services. | Negative impact Magnitude- small Sensitivity- Low/ Medium | <ul style="list-style-type: none"> The TMR should be set up in developed land and away from surface water body, Wastewater treatment as suggested above; Implement Biodiversity management framework, Refer to Appendix M. | Project implementation stage | PMU & POIs | Solid waste and waste water treatment facility in the TMR plant |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|---------|--|--|---|---|------------------------------|----------------|---|
| | | Discharge of untreated wastewater in surface water body may have impact on natural/ modified aquatic habitat. | <i>Significance- Minor/ Moderate</i> | | | | |
| | | The civil construction activities will generate fugitive emission from earth work, handing of construction materials and transportation of construction materials. Operation of machineries and equipment would generate noise. Air and noise emission potential to cause localised impact on ambient and air and noise quality. During operational stage fugitive emission TMR plan, potential to have impact occupational health and safety of the workers if not properly managed. | Negative impact <i>Magnitude- Small/ medium</i> <i>Sensitivity- Low/ Medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> Dust suppression measures shall be adopted through periodic water sprinkling during dry period in working area, Construction materials shall be stored in designated storage area, DG set with adequate stack shall be used for sourcing of power for construction activities, Appropriate PPE should be provided to the construction workforce, Provision of dust collector system to control fugitive emission, Appropriate PPE should be provided to the workers working in the TMR plant, Implement Occupational Health and Safety Management Plan - refer to Appendix O. | Project implementation stage | PMU & POIs | Provision of PPE |
| | | During construction period of TMR Plant, potential to create job (construction labourer) and economic opportunity (supply of civil construction materials). During operation phase, workforce will be required for the operation and maintenance of TMR Plant; which have potential positive impact on Job & economic opportunities. | Positive impact <i>Magnitude- Small/ Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> Provide and communicate clear information about the Project's requirement related to job/employment and business, opportunities and provide priority to locals where feasible. Prioritising use of local workforce, especially the unskilled and semi-skilled workers to be employed, subject to meeting the requirements, Supervise the recruitment process by the contractor in accordance with Stakeholder Engagement Procedure, Conduct due diligence of the local suppliers to identify and evaluate the quality of services and products provided by local suppliers in line with the required standards, The grievance mechanism should be accessible to all villagers to report concerns associated with job and business opportunities as well as other concerns (if any). An immediate investigation will be undertaken for all submitted grievances, Implement Stakeholder Engagement Plan (SEP). | Project implementation stage | PMU & POIs | Number of local people benefited from the project. |
| | | Potential to enhance the sustainable livelihood of the milk producer through increase of milk production through TMR feeding. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The SC/ST HHs and other vulnerable population could be identified for specific training and support from RAs. | Project implementation stage | PMU & POIs | Number of new milk producers comes under Milk Union |
| C.2 | Demonstration of Fodder Production & Conservation Technology | | | | | | |
| C.2.1 | Setting up of Fodder Seed Processing Plant | Potential to enhance the sustainable livelihood of the milk producer through increase of milk production of own fodder from quality of fodder seed procuring from Fodder Seed Processing Plant | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The SC/ST HHs and other vulnerable population could be identified for specific training and support from RAs. | Project implementation stage | PMU & POIs | Number of new milk producers comes under Milk Union |
| | | Operation fodder seed processing plant will generate the fugitive dust and noise. If these are not properly mitigated, potential to have impact occupational health and safety of the workers. | Negative impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Provision of dust collection system,; Provision of PPE to the workers Implement occupational health and safety management plan, (Refer to Appendix O) and Air & Noise Quality Management Plan (refer to Appendix P) | Project implementation stage | PMU & POIs | Provision of PPE to the workers |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|---------|---|--|---|---|------------------------------|----------------|--|
| C.2.3 | Demonstration of community level green fodder production | Potential to enhance the sustainable livelihood of the milk producer through an increase in milk production through the cultivation of fodder on their own land or community land | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> The SC/ST HHs and other vulnerable population could be identified for specific training and support from RAs. | Project implementation stage | PMU & POIs | Number of community level green fodder unit initiated under this project. |
| | | For irrigation purpose water would be require. If the fodder demonstration units are located in the ground water stressed area (over exploited/ critical area), potential to impact on ground water resources. | Negative impact <i>Magnitude- Small/ Medium</i> <i>Sensitivity- Low/ medium</i> <i>Significance- Minor /Moderate</i> | <ul style="list-style-type: none"> Effective irrigation system to minimise the water use | Project implementation stage | PMU & POIs | Water conservation measures |
| C.2.4 | Demonstration of Biomass Management Technologies | Under this sub-project, the utilisation of crop residues for fodder purposes will be demonstrated. This will reduce the amount of crop residue that burns after harvesting. This can significantly reduce the emissions from crop residue burning. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Awareness generation among the farmers to use heavy duty mobile Conveyer fed chaff cutter for harvesting; EIA will demonstrate the system at village level in their operational area. Farmers will be educated on safe operation, key adjustments, minor repairs and maintenance schedules. | Project implementation stage | PMU & POIs | Increase the coverage of use of biomass management technologies at field level |
| C.2.5 | Pilot on Mobile Fodder Seed Processing Unit | Potential to enhance the job and economic opportunities through selling the seed to POI. | Negative impact <i>Magnitude- Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor</i> | <ul style="list-style-type: none"> POI will select of seed growers in remote areas for fodder seed production under NLM. POI will identify officers/ staff from seed units and their training in different aspects for project implementation work. POI will provide on-farm support to seed growers for supply of breeder/ foundation seed, registration with state seed certification agency, seed crop cultivation & processing activity. For storage of additional fodder seed, there will be need of additional storage godown. Support will be provided for construction of storage godown. | Project implementation stage | PMU & POIs | Number of small farmers comes under this program |
| | | For irrigation purpose water would be require. If the fodder demonstration units are located in the ground water stressed area (over exploited/ critical area), potential to impact on ground water resources. | Negative impact <i>Magnitude- Small/Medium</i> <i>Sensitivity- Low/ medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> Effective irrigation system to minimise the water use | Project implementation stage | PMU & POIs | Water conservation measures |
| C.3 | Pilot on control of Bovine Mastitis & EVM | | | | | | |
| C.3.1 | Pilot on control of Bovine Mastitis | Potential to enhance the sustainable livelihood of the milk producer through increase of milk production through control of control of Bovine Mastitis | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Awareness creation can also be taken up through available village level functionaries (DCS/MPP) by training them on mastitis control and EVM, although, there is no remuneration under the project for these activities for the DCS/MPP functionaries | Project implementation stage | PMU & POIs | Number of animal vaccinated under this program |
| C.3.2 | Pilot on propagation of Ethno-Veterinary Medicine (EVM) for bovine ailments | Potential to enhance the job and economic opportunities through involvement of technical manpower. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Low</i> <i>Significance- Minor</i> | <ul style="list-style-type: none"> Provide and communicate clear information about the Project's requirement related to job/employment and provide priority to locals where feasible. Supervise the recruitment process by the contractor in accordance with Stakeholder Engagement Procedure. | Project implementation stage | PMU & POIs | Number of animal vaccinated under this program |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|--|--|--|---|--|------------------------------|----------------|---|
| | | Disposal of biomedical waste generated from this sub-project in non-designated area potential to cause contamination of soil and ground water quality. Improper handling of biomedical waste have potential negative impact on occupational and community health and safety. | Negative impact <i>Magnitude- Small</i> <i>Sensitivity- Low/ medium</i> <i>Significance- Minor/ Moderate</i> | <ul style="list-style-type: none"> Biomedical waste from the site should be collected and disposed in accordance to the Bio Medical Waste Management Rules, 2016 | Project implementation stage | PMU & POIs | Visual observation of waste management facility |
| C.4 Manure Value Chain Development Programme | | | | | | | |
| C.4.1 | Establishing Gobar gas Clusters | Implementation of Flexi Biogas plants in farmer's backyard or in the field will reduce the methane emission and reduction of GHG emission Implementation of biogas unit will improved access to clean energy for women and time saving while increasing their workload in slurry management | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Promote the bio-gas plant at household level; Provide initial support (technical and financial) to install the bio-gas plant | Project implementation stage | PMU & POIs | Number of farmers installed the bio-gas plant |
| C.4.2 | Pilot on establishing slurry processing centres | The combustion of biogas is associated with the release of pollutants like CO, SO ₂ , VOCs, and NO _x into the atmosphere. This may have a potential impact on local ambient air quality. | Negative impact <i>Magnitude- Small</i> <i>Sensitivity- Low/ medium</i> <i>Significance- Minor/ Moderate</i> | - | - | -PMU & POIs | - |
| | | The slurry generated from the biogas plant can be used as manure in the agriculture field. As well as surplus slurry, which can be sold as manure, The use of biogas in cooking lowers the cost of cooking gas. This has the potential to have a positive impact on economic opportunities. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> POIs would identify the village level DCS/MPP and arrange to provide the list of beneficiaries (preferably women), The beneficiary shall also have to agree for creation of fund for repair and maintenance and future replacement of plants, The slurry processing centre would be setup based on the willingness of the POIs and feasibility of the sustained operations, and NDDDB would provide technical and operational support during implementation of the Project. | Project implementation stage | PMU & POIs | Number of farmers installed the bio-gas plant |
| C.5 Pilot on Solar Energy solution for dairy | | | | | | | |
| C.5.1 | Pilot on Rooftop Solar PV System at DCS/MMP | The implementation of these project sub-components will promote renewable energy, which will ultimately reduce the air emissions from backup power supply (DG sets, reduction of GHG emission and promote alternative energy. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Promote the Rooftop Solar PV System at DCS/MMP, BMC and dairy plant, Provide initial support (technical and financial) to install the bio-gas plant. Solar panel waste (discarded panel) will be disposed as per E-Waste (Management) Rules, 2022. | Project implementation stage | PMU & POIs | Number of facilities installed the solar system and percentage of energy savings. |
| C.5.2 | Pilot on Augmentation of BMC with solar powered instant milk chiller | | | | | | |
| C.6 Pilot on evolving Green House Gas (GHG) mitigation Strategies | | | | | | | |
| C.6.1 | Pilot on measurement of Methane emissions in Progeny Testing (PT) projects | Methane generation can be reduced through balanced feed. With the input output ratio for a given quantity of feed better for the high yielding animals, the | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> It is proposed to evolve a model to prepare action plan for reducing the GHG emission of a dairy cooperative and implement the action plan to reduce emissions | Project implementation stage | PMU & POIs | Number of facilities initiated the GHG reduction measures |
| C.6.2 | Pilot on development of feed additives for methane mitigation | | | | | | |

| Sl. No. | Components & Subcomponents | Potential Impact | Impact / Risk Categorization | Mitigation/ Enhancement measures | Implementation Schedule | Responsibility | Monitoring |
|---------|--|--|--|--|------------------------------|----------------|------------|
| C.6.3 | Climate Smart Dairying – Pilot on evolving mitigation strategies for Carbon Foot print of dairy sector | methane emission is further expected to reduce. The methane emissions can be further controlled through promoting feed control strategy to reduce enteric methane through extensive training and capacity building at various levels with a major focus on milk producers | | | | | |
| D. | Component D: Project Management and Learning | | | | | | |
| D.1 | Establishment, operation & management of computerised MIS at NDDDB & POIs level | Potential to increased awareness and capacity building of the officials from POI, DAHD and NDDDB through learning and sharing good practices both in the project area nationally and internationally. | Positive impact <i>Magnitude- Medium</i> <i>Sensitivity- Medium</i> <i>Significance- Moderate</i> | <ul style="list-style-type: none"> Establishment, operation and management of computerised MIS to capture data and generate reports on performance, including output/ outcome indicators, Services of external agencies for carrying out baseline, mid-term, annual and project completion surveys and other special surveys/studies (including thematic studies) as may be needed during project implementation. Third-party quality assurance of civil works under the project, and Support to PMUs. | Project implementation stage | PMU | - |
| D.2 | Services of external agencies for carrying out baseline, mid-term, annual and etc | | | | | | |
| D.3 | Third-party quality assurance of civil works under the project | | | | | | |
| D.4 | Support for project co-ordination & monitoring | | | | | | |

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

8.1 Objective

The objective of ESMF is to frame guidelines and procedures to address the environmental and social risks and impacts associated with the implementation of NDSP-II. The specific objectives are as follows:

- Outline the process to identify and assess the environmental risks/ impacts/ issues relevant to the proposed project/sub-projects,
- Ensure that the environmental and social management plans are aligned with the requirements of the country system as well as with the World Bank ESF requirements,
- Establish clear procedures and methodologies for the environmental and social screening, review, approval, and implementation of sub-projects to be financed the World Bank,
- To ensure that mitigation measures are designed to effectively mitigate the potential adverse environmental and social impacts,
- Institutional framework for E&S Management aligned with proposed NDSP-II Project Management structure,
- Environmental and Social Management Framework outlining mitigation measures, impact monitoring indicators, implementation schedule, cost estimates and primary responsibility for implementation, and
- Capacity development and training.

8.2 Institutional Framework

8.2.1 Project Implementation

NDDDB is an institution of national importance established by an Act of the Indian Parliament in 1965 will be the implementing entity for the proposed project. It is an internationally recognized institution in the dairy sector and has also successfully implemented the National Dairy Plan-Phase I.

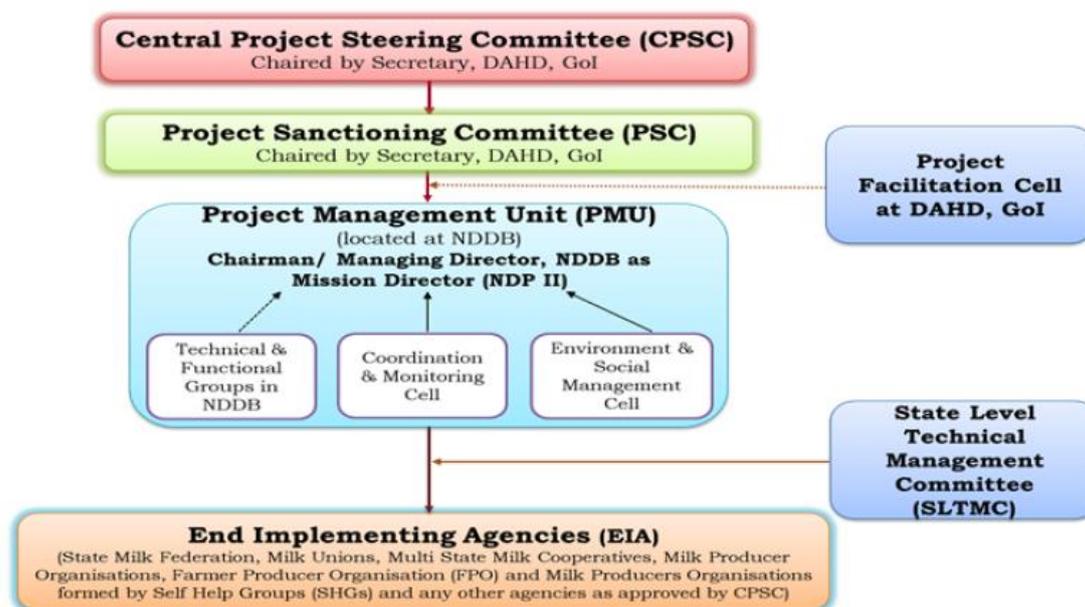
The proposed Institutional Framework has been designed with a view to:

- Ensure effective coordination with Producers' Owned Institutions (POIs);
- Facilitate regular monitoring and smooth implementation of the project; and
- Facilitate POIs to comply with environmental and social requirements of the project.

8.2.2 Institutional arrangement

The project will be implemented by National Dairy Development Board (NDDDB) through eligible Producers' Owned Institutions (POIs). The proposed institutional arrangement has been designed with a view to ensure effective coordination, monitoring and comply with environment and social requirement of the project. The proposed institutional arrangement has been presented in following figure.

Figure 8.1 Institutional Arrangement



8.2.3 Roles and Responsibilities

Central Project Steering Committee (CPSC)

Central Project Steering Committee (CPSC) will be headed by the Secretary (AHD), Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry & Dairying, Government of India. CPSC will give policy directions, approve annual action plans, sanction the release of funds to NDDB, generally oversee and review implementation of the project. The CPSC would have authority to consider and approve changes in eligibility criteria with reference to End Implementing Agencies (EIAs), project guidelines, project area, funding pattern, composition of CPSC & PSC, and component structure. CPSC will also have authority to extend sub-scheme/project period, add/remove End Implementing Agencies, change fund flow and utilization mechanism etc. for smooth implementation of the project. CPSC would meet twice a year, or as frequently as may be required.

Project Sanctioning Committee (PSC)

Project Sanctioning Committee (PSC) will be headed by Secretary (AHD), GoI. The PSC will have authority to sanction the sub-project plans and have project oversight. PSC will meet frequently as necessary to ensure that sub-project plans are considered/sanctioned within one month of submission by the Project Facilitation Cell (PFC) at DAHD. The PSC will have powers to authorise the re-appropriation of funds within a project component, between EIAs & within the approved sub-projects of same EIA, re-appropriation between releases/allocations made to EIAs and within different sub-projects of same EIA (in case fund is stagnated), change of the unit cost & norms of items, and decide the terms & conditions of the agreements to be executed with the stakeholders under the project..

State Level Technical Management Committee (SLTMC)

At the State level, there will be a State Level Technical Management Committee (SLTMC), which will be headed by Additional Chief Secretary/ Principal Secretary/ Secretary/ Commissioner of the State Animal Husbandry and Dairy Development Department, comprising representative of DAHD, SRLM, State Dairy Federation and NDDB as members for effective implementation and to have synergy among the similar dairy development programmes implemented in the State. SLTMC shall oversee state-level

monitoring of the projects, the land availability for village level institutions like, primary dairy societies and primary level cold chain infrastructure statutory requirements, coordination among EIAs, policy support, etc. The SLTMC will recommend the sub-project plans of EIAs to PSC for approval. SLTMC shall ensure that there is no duplication of activities and project area in the States.

Project Facilitation Cell (PFC)/Technical Support Unit (TSU) at DAHD

Under the project, for smooth coordination and monitoring of the project implementation, PMUs will be established - one at DAHD level and another at NDDDB level.

The PFC will provide secretarial support to CPSC and PSC. Functions of PFC are as under:

- Examine and ensure that SPPs are in compliance to the Project guidelines/manuals.
- Responsible for appraisal of SPPs. Circulate the SPPs to appraisal agencies, compile & finalise appraisal note.
- Conduct Project Sanctioning Committee (PSC) meetings & prepare minutes.
- Process administrative approvals.
- Seek policy proposals (if any) (in view of operational issues of projects) from the members of CPSC including NDDDB and finalise the agenda.
- Conduct meeting for consideration of CPSC.
- Maintain data on monitoring parameters set under the project and progress made thereof and analyse data to place before CPSC/PSC from time-to-time.
- Process release of funds to EIAs through NDDDB using PFMS.

Project Management Unit-NDDDB

Under the project, for smooth coordination and monitoring of the project implementation, a Project Management Unit (PMU) will be set up at NDDDB, Anand. PMU-NDDDB will be headed by Chairman/Managing Director, NDDDB as Mission Director (NDP II). PMU-NDDDB will be supported by various Technical/Functional Groups within NDDDB during implementation of the project. PMU-NDDDB will have Co-ordination & Monitoring Cell and Environment & Social Cell. Functions of PMU-NDDDB are as under:

- Manage the implementation and monitoring of day-to-day project activities.
- PMU-NDDDB shall identify necessary changes required in the project for effective implementation and for suitable policy decision.
- PMU-NDDDB will also prepare an annual action plan and technical interventions required for smooth implementation of the project for consideration of CPSC/PSC.
- Provide technical assistance to POIs for project implementation.
- Monitor the physical and financial progress of the project as per Key Performance Indicators (KPIs) and prepare monthly, quarterly and yearly progress reports.
- Conduct field visits to monitor the sub project progress with a focus on project process and outputs.
- Release of advance/reimbursement of funds utilised by POIs through PFMS.
- Process the FUCs received from POIs and submit GFR 12-A to DAHD.
- Prepare Interim Unaudited Financial Report (IUFR) and submit to CAA&A with an intimation to DAHD
- Monitor both financial and physical progress of the project.
- Carry out baseline, annual, mid-term and end term project surveys and studies.

- Midterm review of the project and prepare note for mid-course correction of the project including re-appropriation of the fund within the component/sub-component of the project.
- Preparation of sub-project closure report at the end of project period.

POI level Institutional arrangements

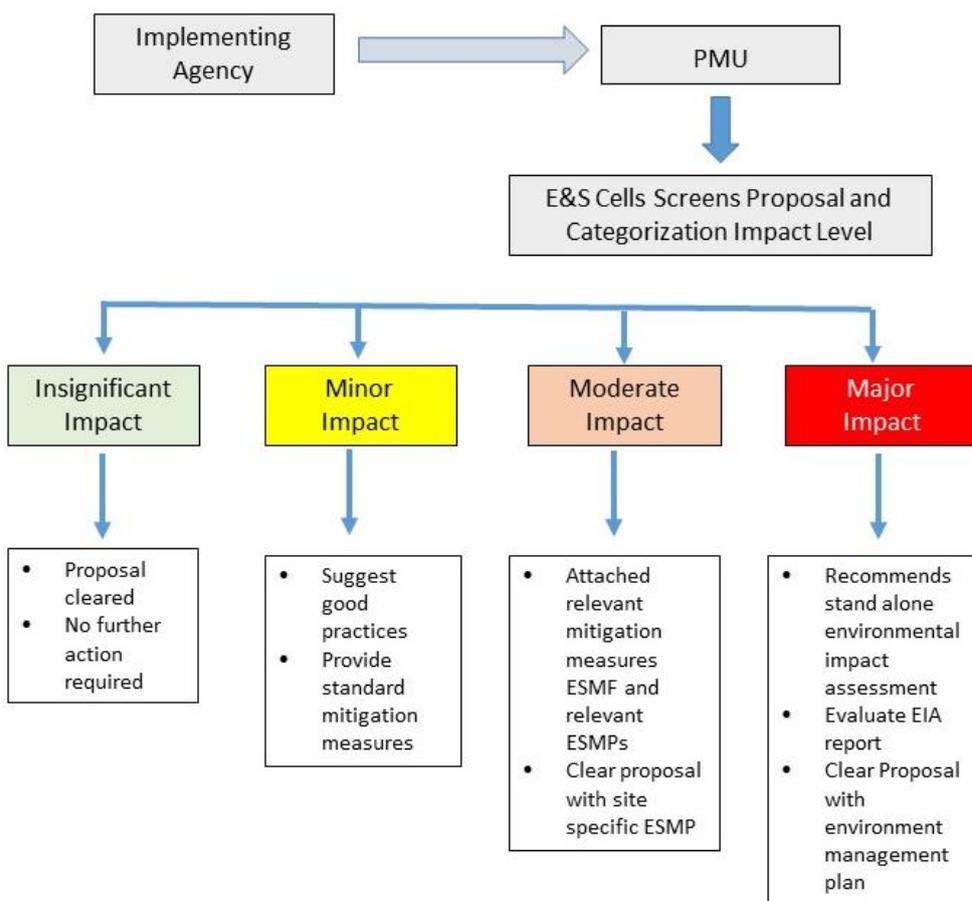
At each POI level, there will be a Sub-project Management Committee (SPMC) headed by MD (or Implementation Cell (SPIC) which will be equivalent) of the POI. Each activity will have Sub-project headed by a Sub-Project Coordinator.

The POIs will need to meet the technical, financial, and management capacity requirements for implementing the activity for which they are considered. POIs mainly include state dairy federations, district cooperative milk unions, producer companies, and other entities that meet the eligibility criteria. To be eligible for funding under the project, each POI will prepare an Integrated Sub Plan proposal for implementing a comprehensive set of activities under the project.

8.3 ESMF Adoption Framework

All the proposed investments under NDDDB will follow the following process for the implementation of ESMF as shown in **Figure 8.2**.

Figure 8.2 ESMF Process Flow Chart for Proposed Investments



In case the proposed sub-project falls under the category having major impact, the implementing agency will be required to conduct separate environmental impact assessment. The details of the roles and responsibility and an understanding of the specific functions are contained in the following sub sections.

To guide Sub Project preparation, the potential POIs would follow steps outlined in FORM 'A' (**Appendix R**) and submit duly filled FORM 'A' with their proposal. The ESC of the PMU will evaluate the POI proposal as per **Appendix S**.

8.4 E&S Management Process Elements

In this background, the E&S Management process elements such as the following have been formulated to neatly dovetail into overall NDSP- II Project Management Systems and Procedures proposed by PMU

- Screening and Assessment process as part of Plan preparation;
- Scope of E&S Screening and Assessment across various Sub components proposed under NDSP- II; and
- Parameters to be monitored and reported by POIs across various Sub Components proposed under NDSP -II.

8.4.1 Screening and Assessment Process

Screening is the first step in any ESMF process. The screening exercise will determine the key environmental concerns, its nature and magnitude of the potential impacts that may arise from proposed project or sub-project activities. The major environmental issues need to be identified based on type, location, sensitivity and scale of the project component/sub-components. This exercise will reflect if the detail assessment is required or the type and extent of Environmental and Social Assessment (ESA) is needed. The results of the screening procedure are a crucial part of the analysis of the project's or sub-projects' feasibility. The screening shall be conducted in accordance with the current applicable rules, regulations, and laws of the nation. It will indicate whether the project requires EIA or ESIA or to determine the need for conduction Social Impact Assessment (SIA) on specific social issue.

The key steps involved in the process are briefly outlined below.

- Step 1: (a) Review available project details, location map, and regulatory aspects, (b) conduct reconnaissance site visits for ground-truthing and screening, (c) ascertain if the sub-project is an eligible investment.
- Step 2: Screen for the presence of any environmentally sensitive areas, project components of high risk, and probable benefits
- Step 3: Determine - the project category based on screening and appropriate E&S instruments that shall be prepared to incorporate necessary mitigation measures.
- Step 4: Revisit the screening checklist and ascertain the outcomes of the screening checklist. Undertake the detailed screening process for the proposed investments.

And whereas social screening is essential for assessing possible risks that may emanate from the proposed project/ sub-projects. The screening should be based on existing socioeconomic status of population who are supposed to be potentially benefited or affected by the interventions directly or indirectly. Social screening identifies probable impacts of the proposed project in general context, hinging on stakeholder's responses to issues that may affect various socioeconomic variables in person or in general. But detailed examination of critical issues are imperative through the screening, applying social investigation techniques like FGDs.

The outcome of this screening process will help prioritize the various investments and where required, start the permits/ NOC. Projects for which the permits/ NOC process may be longer can be sequenced/ phased later in the overall project implementation plan. However, the permits/ NOC processes for such projects/sites shall be initiated at the earliest. This shall help ensure that no sub-projects are impacted due to delays in the permits/ NOC procedures and regulations.

PMU E&S specialists shall provide help in screening the subproject and the POI shall submit the screening report (Form A) along with the sub project proposal. The sub project will be then assessed by the PMU and based on the assessment, the sub project shall be recommended for approval (refer to **Figure 8.3**).

8.4.2 Categorization of sub-projects

Categorization of sub-projects is to be done during the selection of project and shall be integral component of pre-design phase. E&S analysis of the relevant component of sub-project is required to indicate likely environmental and social issues of the proposed activities. The E&S categorization is done based on risk inherent to the project or sub-project, as well as the likelihood of a development taking place and on what can be reasonably ascertained about the environmental and social characterization of the project's/sub-project's likely geographical setting.

Sub- project components, will go through screening process to identify relevant environmental concerns as well as suggest any further necessary investigation and assessment. As per categorization by the World Bank (ESS 1), most of the proposed components can be classified as "low risk" and only generic mitigation or monitoring measures are required for low risk project. The categorization of project/ sub-projects is listed in **Table 8.1**.

Figure 8.3 Flow Chart of Screening and Assessment Process

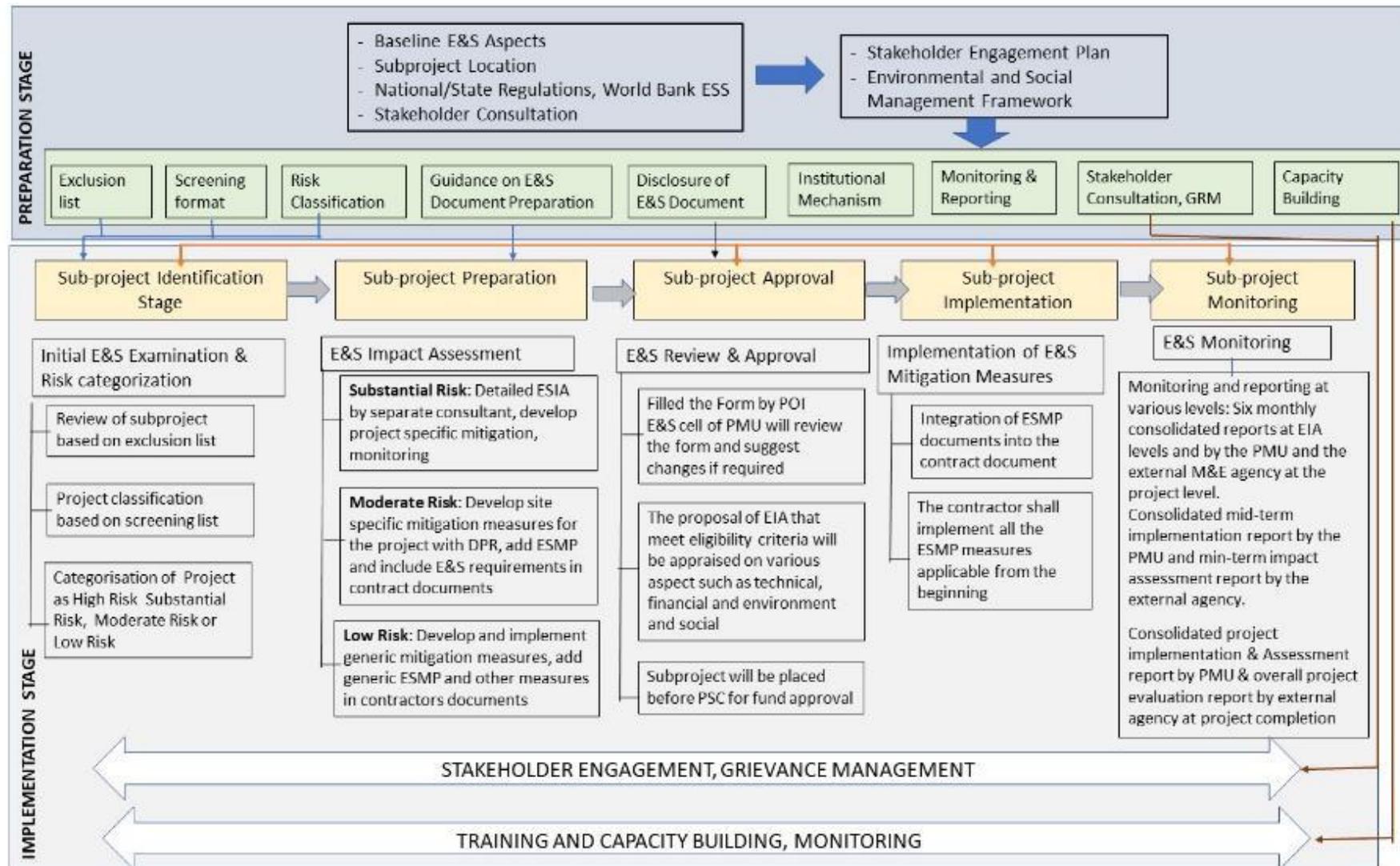


Table 8.1 E&S Risk Categorization of Proposed Activities as per ESS

| Components | | Sub-Components | The extent of Environment and Social Risks | | Applicable ESS Standard |
|--|--|---|--|-----------------|-------------------------|
| | | | Pre-mitigation | Post mitigation | |
| Component A: Enhancing Institutional Capacity and Sustainability | A.1: | Institutional capacity building | | | |
| | A.1.1 | Dairy Cooperative Society (DCS) level capacity building | Moderate | Low | ESS 7, ESS 10 |
| | A.1.2 | Milk Union Level capacity building | Moderate | Low | ESS 7, ESS 10 |
| | A.1.3 | Farmer level capacity building | Moderate | Low | ESS 7, ESS 10 |
| | A.2: | Human Resource Development | | | |
| | A.2.1 | Deployment of Lady Extension Officer (LEO) | Moderate | Low | ESS 7 |
| | A.3 | Adoption of Technology | | | |
| | A.3.1 | Strengthening of Training Centers | Low | Low | ESS 10 |
| Component B: Strengthening Dairy Market Development | B1: | Strengthening the dairy Supply Chain System | | | |
| | B.1.1 | Expansion of village coverage | Low | Low | ESS 7, ESS 10 |
| | B.1.2 | Strengthening village level milk chilling infrastructures | Moderate | Low | ESS 1 |
| | B.1.3 | Provision of village level milk testing equipment | Low | Low | ESS 4 |
| | B.1.4 | Milk Adulterant and testing equipment at BMC Level | Low | Low | ESS 4 |
| | B.1.5 | Community Milking Centres | Moderate | Low | ESS 1, ESS 4 |
| | B.1.6 | Milk Tanker based milk measurement and sampling system | Low | Low | ESS 4 |
| | B.1.7 | Installation of AMCS solution at DCS/MPP | Low | Low | ESS 4 |
| | B.1.8 | Village level Milk Pasteurization and Product Manufacturing | Moderate | Low | ESS 3 |
| | B.1.9 | Clean Milk Production (CMP) programme for milk producer members | Low | Low | ESS 4 |
| B.2 | Strengthening the sales and marketing system | | | | |

| | | | | | |
|--|-------|--|----------|-----|----------------------------|
| | B.2.1 | Provision of Visi-cooler, Chest coolers, Deep freezers, Instant Ice cream making units/ Softy Machines and Insulated crates in key outlets/ booths. | Low | Low | ESS 3 |
| | B.2.2 | Installation of booths/ parlours/ kiosks on Government land/ institution premises given to them on a long-term lease for free or against nominal rent; | Low | Low | ESS 3 |
| | B.2.3 | Recruitment of sales professionals to spearhead all sales & marketing activities of POIs; | Low | Low | ESS 7, ESS 10 |
| | B.3 | Enhancing Food Safety and Quality | | | |
| | B.3.1 | Milk quality Improvement Programme | Low | Low | ESS 4 |
| | B.3.2 | Dairy Plant Improvement Programme | Moderate | Low | ESS 1, ESS 2, ESS 3, ESS 4 |
| | B.3.3 | Introduction/up-gradation of Food Safety Management System (FSMS) (ISO 22000/ FSSC 22000 and/or Quality Mark/ CAS MMP) | Low | Low | ESS 4 |
| | B.3.4 | Strengthening dairy business operations through ICT support | Low | Low | ESS 10 |
| | B4: | Strengthening dairy business operations through ICT support | Low | Low | ESS 10 |
| Component C: Productivity Improvement and Enhancing Resilient Rearing Practices | C.1 | Promotion of Scientific Feeding Practices | | | |
| | C.1.1 | Ration Advisory Services | Low | Low | ESS 7 |
| | C.1.2 | Calf Rearing Programme (CRP) for buffalo & cow calves | Moderate | Low | ESS 1, ESS 2, ESS 3, ESS 4 |
| | C.1.3 | Village level producers' institutions based TMR Plant | Low | Low | ESS 1, ESS 2, ESS 3, ESS 5 |
| | C.2 | Demonstration of Fodder Production & Conservation Technology | | | |
| | C.2.1 | Setting up of Fodder Seed Processing Plant | Low | Low | ESS 1 |
| | C.2.2 | Demonstration of Green Fodder Conservation Technologies | Moderate | Low | ESS 6 |
| | C.2.3 | Demonstration of community level green fodder production | Moderate | Low | ESS 3, ESS 5, ESS 6 |
| | C.2.4 | Demonstration of community level green fodder production | Low | Low | ESS 3 |

| | | | | | |
|--|-------|--|-----|-----|---------------------|
| | C.2.5 | Demonstration of Biomass Management Technologies | Low | Low | ESS 3 |
| | C.2.6 | Pilot on Mobile Fodder Seed Processing Unit | Low | Low | ESS 1 |
| | C.3 | Pilot on control of Bovine Mastitis & EVM | | | |
| | C.3.1 | Pilot on control of Bovine Mastitis | Low | Low | ESS 4 |
| | C.3.2 | Pilot on propagation of Ethno-Veterinary Medicine (EVM) for bovine ailments | Low | Low | ESS 4 |
| | C,4 | Manure Value Chain Development Programme | | | |
| | C.4.1 | Establishing Gobar gas Clusters | Low | Low | ESS 3 |
| | C.4.2 | Pilot on establishing slurry processing centres | Low | Low | ESS 3, ESS 4, ESS 5 |
| | C.5 | Pilot on Solar Energy solution for dairy | | | |
| | C.5.1 | Pilot on Rooftop Solar PV System at DCS/MMP | Low | Low | ESS 3 |
| | C.5.2 | Pilot on Augmentation of BMC with solar powered instant milk chiller | Low | Low | ESS 3 |
| | C.6 | Pilot on evolving Green House Gas (GHG) mitigation Strategies | | | |
| | C.6.1 | Pilot on measurement of Methane emissions in Progeny Testing (PT) projects | Low | Low | ESS 3 |
| | C.6.2 | Pilot on development of feed additives for methane mitigation | Low | Low | ESS 3 |
| | C.6.3 | Climate Smart Dairying – Pilot on evolving mitigation strategies for Carbon Foot print of dairy sector | Low | Low | ESS 3 |
| Component D: Project Manag. and Learning | D.3 | Third-party quality assurance of civil works under the project | Low | Low | ESS 2 |

8.4.2.1 List of Negative Aspects to Exclude from NDSP II Project

To avoid any serious negative impact on environment the activities of following activities will be excluded

- Any activities that does not comply with the laws and regulations of country like
 - Food Safety and Standards (Milk and Milk Products) Regulations, 1992,
 - Cattle Feed (Regulation of Manufacture and Sale) Order, 2009,
 - Prevention and Control of Infectious and Contagious Diseases in Animal Act, 2009.
 - Use of asbestos in construction of any facilities under NDSP II project and sub-project
- Any activities that require land procurement, following avoidance measures shall be taken:
 - Avoid the land procurement (direct purchase/lease) from Scheduled Caste community members in respective states;
 - Avoid the land procurement (direct purchase/lease) from Scheduled Tribes community members in respective states, specifically in Scheduled V area;
 - Avoid the land transaction (direct purchase/lease) for non-domicile individual or agency;
 - Avoid the land procurement in forest land as applicable under Forest (Conservation) Act, 1980;
 - Avoid the land procurement (direct purchase/lease), where physical displacement will require;
- Activities posing significant risks to the tribal communities, if any, Free, Prior Informed Consent-FPIC shall be obtained.
- Any activities related to use of pesticides banned by the Government such as Aldrin, Chlordane, Endrin, Ethyl Mercury Chloride, Menazone, Nitrofen etc. and not registered under Insecticides Act, 1968 and classified by WHO (Refer to **Appendix T**)
- Unsustainable dairy farming activities which lead to loss of ecologically important areas such as wetlands and forests.

8.4.2.2 Program Level Screening

The programme level screening is required only to determine the consistency of the rules, regulations and laws of Indian government as well as the World Bank's Safe guard/operational policies. Based on the nature, scale and extent of impact, different level of assessment need to be carried out on environmental and social issues. This project has no provision of land acquisition, so there is no resettlement issue. The efforts of NDDB project mainly relates to enhance productivity, marketing, supporting the baseline producers etc. The proposed activities under this program may not exert adverse impact on protected areas, natural habitats, cultural property resources, small ethnic communities etc.

8.4.3 Sub-Project Preparation

POI must submit the sub-project plan for funding if it intends to get support for any project component or sub-component. PMU may, upon request, offer technical support to POI's preparation of sub-project plan. PMU will assess if the POI satisfies the project's essential eligibility requirements. The proposals of those POIs that meet all necessary eligibility requirements will be taken into consideration for further processing. The proposal of POIs that meet eligibility criteria will be appraised based on various aspects such as technical, financial, procurement goods, works and services and environmental and social.

8.4.3.1 Environment and Social Management Plan (ESMP)

- The management plan shall consider various activities proposed under the sub-project and provide management measures to be followed for different phases of implementation, along with the responsibility allocation for implementation and monitoring.
- Apart from addressing the issues, management measures shall also explore enhancement opportunities and their inclusion in project components.
- The management measures identified shall be made part of the sub-project components and shall be included in the bid documents appropriately.

8.4.4 Sub-Project Implementation

For each of the identified sub-projects, where civil works required, the implementation process begins with the invitation of bids from possible implementation partners. Incorporating E&S requirements into the RFP is crucial so that contractors are aware of them and have the necessary resources and institutional setup to ensure the implementation of E&S enhancement and mitigation measures with the preparation of sub-project plan for financial assistance. The sub-project plan received from the POIs is to be examined and recommended by the PMU and will be placed before the Project Steering Committee (PSC) for approval and sanctions of funds for disbursement.

8.4.4.1 Incorporating ESMP into Contractor Documents

This subsection provides guidelines on the integration of the draft ESMP documents into the contract documents. With the revision to the World Bank's Standard Bidding Documents in January 2017, Environmental Health and Safety (EHS) requirements are well defined in the bid documents. Also, an EHS Performance Security has been incorporated into the requirements (in Standard Bid Format) from potential bidders for the implementation of works under project financing. This revision incorporates changes to enhance environmental, social, health, and safety performance during all stages of the subproject.

8.4.4.2 Onsite Implementation of ESMP

The contractor shall implement all the ESMP measures applicable for the project right from the pre-construction stage and ESMP implementation. POI will monitor the implementation of ESMP measures during implementation who will be supported by various Technical Groups within NDDB and report to Project Steering Committee (PSC).

8.4.5 Monitoring Framework

Monitoring of the ESMF implementation is needed to verify impacts, ensure adherence to approved plans, environmental standards and general compliance. Monitoring of the ESMF is not to be confused with monitoring EMPs, which are sub-project specific and therefore site specific only.

Monitoring of the ESMF would need to cover the entire project. The objective of ESMF monitoring would be:

- provide timely information about the success or otherwise of the Environmental Management process outlined in the ESMF in such a manner that changes can be made as required to ensure continuous improvement to the process; and
- to evaluate the performance of the ESMF by determining whether the mitigation measures designed into proposed activities have been successful.

The E & S Cell would need to undertake six monthly monitoring of ESMF. Should there be an activity in which there are indications of serious deviation in the E&S cell would need to undertake a special study to determine the true extent of the deviation and recommend the way forward. Independent assessment of the adequacy and implementation of the ESMF at two or three year intervals would also need to be

undertaken. Annual reports on ESMF implementation will have to be compiled by E&S cell for review at different levels.

Apart from the suggested regular monitoring to be performed by the E& S cell, a participatory monitoring at the dairy cooperative level could be integrated into the monitoring design. The frequency of such monitoring could be on yearly basis and the findings could be integrated into the regular E&S monitoring.

The external, independent monitoring agency that would need to be engaged to undertake the mid-term and end term monitoring and evaluation of the project could also be entrusted the assessment in reference to E&S issues. In this context, the external agency would have to assess that the project impact on agreed E&S indicators are generally satisfactory and identified risks are being addressed adequately.

8.4.5.1 Monitoring Strategy

Monitoring would need to be done in a participatory manner, along with the involvement – on a sample basis – of milk producers and IAs with the possible inclusion of the various service providers in the project implementation chain and stakeholders which are identified as getting impacted, though not directly being a part of the NDSP II. The midterm and end term evaluation would need to be shared by the project with stakeholders participating in the project so that they get an opportunity to give feedback and understand the impacts of the sub-project component. While broad monitoring indicators have been provided here, sub- project specific indicators, especially for field activities, will need to be developed through consultations and PRA tools with the community.

8.4.5.2 Monitoring Indicators

The monitoring and reporting indicators for project and sub-project component has been provided under in ESMF table (Refer to **Table 8.2**). The component wise monitoring frequency and responsibility has been presented in following table.

Table 8.2 E&S Monitoring Framework

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|---------|--|---|--|--|----------------------|------------------------|
| A. | Component A: Enhancing Institutional Capacity and Sustainability | | | | | |
| A.1 | Institutional capacity building | | | | | |
| A.1.1 | Dairy Cooperative Society (DCS) level capacity building | Training and awareness of DCS | DCSs trained on animal rearing and dairying | Number of DCS received in district | Half-yearly | PMU |
| | | Vulnerability (gender, SC, ST, and vulnerable group). | Grievances on non-inclusion of women, SC, ST, and vulnerable group in training and capacity building program | Number of grievances raised in DCS | Half-yearly | PMU |
| A.1.2 | Milk Union Level capacity building | Training and awareness of Milk Union | Milk Union trained on animal rearing and dairying | Number of Milk Unions received in district | Half-yearly | PMU |
| | | Vulnerability (gender, SC, ST, and vulnerable group). | Grievances on non-inclusion of women, SC, ST, and vulnerable group in training and capacity building program | Number of grievances raised in Milk Union | Half-yearly | PMU |
| A.1.3 | Farmer level capacity building | Sustainable livelihood of famers | Farmers received training on animal husbandry | Number of farmers received training in a Milk Union | Half-yearly | PMU |
| | | Vulnerability (gender, SC, ST, and vulnerable group). | Grievances on non-inclusion of women, SC, ST, and vulnerable group in training and capacity building program | Number of grievances raised in DCS | Half-yearly | PMU |
| | | Quality of milk & milk product and public health | Awareness on quality of milk and milk products | Pre and post training awareness generation percentage | Half-yearly | PMU |
| | | Women's empowerment | Women's involvement in dairy business | Number of women accessing project services and benefits. | Half-yearly | PMU |

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|---------|---|---|---|---|----------------------|------------------------|
| | | Inclusion of SC, ST, and vulnerable groups | SC, ST, and vulnerable groups involvement in dairy business | Number of SC, ST, and vulnerable groups project services and benefits. | Half-yearly | PMU |
| A.2 | Human Resource Development | | | | | |
| A.2.1 | Deployment of Lady Extension Officer (LEO) | Employment and livelihood of women's groups | Women's engagement | No. of women members recruited under this Project | Yearly | PMU |
| | | Vulnerability (SC, ST, and vulnerable group). | Grievances on non-inclusion of SC, ST, and vulnerable group in recruitment of LEO | Number of grievances raised in DCS | Half-yearly | PMU |
| A.3 | Adoption of Technology | | | | | |
| A.3.1 | Strengthening of Training Centres | Infrastructure development | Infrastructure development/ improvement in training centre | Number of training centre is improved under this project. | Yearly | PMU |
| B. | Component B: Strengthening Dairy Market Development | | | | | |
| B.1 | Strengthening the dairy Supply Chain System | | | | | |
| B.1.1 | Expansion of village coverage | Infrastructure development | Number of villages comes under the project | Number of new DCS/MPP formed in district/ state | Yearly | PMU |
| B.1.2 | Strengthening village level milk chilling infrastructures | Infrastructure development | Construction of new BMC | Number of BMC constructed in DCS/MPP formed under this project | Yearly | PMU |
| | | Ground water resource | Water conservation measures | Number of BMC initiated water conservation measures like rainwater harvesting | Yearly | PMU |
| | | Road and traffic | Traffic route Vehicular fit certificate | Selection of vehicular access road. Vehicles PUC checking system | Half-yearly | PMU |

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|---------|--|---|--|--|--|------------------------|
| B.1.3 | Provision of village level milk testing equipment | Infrastructure development | Installation of testing equipment | Number of AMCU/ DPMCU. installed in DCS/MPP under this project. | Half-yearly | PMU |
| B.1.4 | Milk Adulterant and testing equipment at BMC Level | Infrastructure development | Installation of testing equipment | Number of AMCU/ DPMCU. installed in DCS/MPP under this project. | Half-yearly | PMU |
| B.1.5 | Community Milking Centres | Land based livelihood of land owners and land users | Livelihood and compensation | Type of land procures/ used for the project; Number of affected household, Compensation provided as per plan | At the time of land procurement | PMU |
| | | Ground water resource | Water use Water conservation measures | Daily consumption Number of community milking center initiated water conservation measures like rain water harvesting | Yearly | PMU |
| | | Ecology & biodiversity | Location of CMC Wastewater treatment system | Location of CMC in any modified/ natural ecological habitat; Wastewater treatment system installed or not | At the time of land procurement Designing stage | PMU |
| | | Job and economic opportunities | Job and economic benefits from the project | Number of local people got the job & economic opportunities from the project. | Half-yearly | PMU |
| B.1.6 | Milk Tanker based milk measurement and sampling system | Infrastructure development | Installation of testing equipment | Number of tankers installed in testing equipment under this project. | Yearly | PMU |

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|------------|--|---|---|---|--|------------------------|
| B.1.7 | Installation of AMCS solution at DCS/MPP | Infrastructure development | Installation of AMCS | Number of DCS/ MPP installed AMCS under this project. | Yearly | PMU |
| B.1.8 | Village level Milk Pasteurization and Product Manufacturing | Land based livelihood of land owners and land users | Refer to B.1.5 | Refer to B.1.5 | At the time of land procurement | PMU |
| | | Ground water resource | Refer to B.1.5 | Refer to B.1.5 | | |
| | | Ecology & biodiversity | Refer to B.1.5 | Refer to B.1.5 | | |
| | | Job and economic opportunities | Refer to B.1.5 | Refer to B.1.5 | | |
| B.1.9 | Clean Milk Production (CMP) programme for milk producer members | Quality of milk & milk product and public health | Refer to A.1.3 | Refer to A.1.3 | | |
| B.2 | Strengthening the Sales and Marketing System | | | | | |
| B.2.1 | Provision of Visi-cooler, Chest coolers, Deep freezers, Instant Ice cream making units/ Softy Machines | Job and economic opportunities | Refer to B.1.5 | Refer to B.1.5 | | |
| B.2.2 | Installation of booths/ parlours/ kiosks | Training and awareness of dairy farmers | DCSs trained on animal rearing and dairying | Number of new or revived DCSs installed Visi-cooler, Chest coolers, Deep freezers, Instant Ice cream making units | Yearly | PMU |
| B.2.4 | Brand Development Support to be provided at State Federation Level/Apex institutions | Sustainable livelihood | Livelihood | Any new branding promoted under this project. | One time during project implementation stage | PMU |

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|---------|---|--|--|---|--|------------------------|
| B.2.5 | Training & Capability Enhancement Support to Sales & Marketing Manpower of POIs | Training and awareness of dairy farmers | DCSs trained on animal rearing and dairying | Number of new or revived DCSs comes under training and capacity building program Participation of women, SC, ST and vulnerable members | Yearly | PMU |
| B.3 | Enhancing Food Safety and Quality | | | | | |
| B.3.1 | Milk quality Improvement Programme | Quality of milk & milk product and public health | Refer to A.1.3 | Refer to A.1.3 | | |
| B.3.2 | Dairy Plant Improvement Programme | Ground water resources | Water use Water conservation measures | Daily consumption Number of community milking centre-initiated water conservation measures like rainwater harvesting | Half-yearly | PMU |
| B3.2 | Milk Chilling Centres | Wastewater generation | Wastewater treatment in ETP to comply with the treated water quality | ETP treated water quality (pH, BOD, COD, TDS, Oil & Grease | Essential parameters daily – detailed parameters Monthly | Dairy unit |
| B.3.3 | Introduction/up-gradation of Food Safety Management System (FSMS) | Quality of milk & milk product and public health | Refer to A.1.3 | Refer to A.1.3 | | |
| B.3.4 | Introduction of Other International Management Systems (ISO) | | | | | |

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|---------|---|--|---|---|----------------------|------------------------|
| B.3.5 | Strengthening dairy business operations through ICT support | | | | | |
| C. | Component C: Productivity Improvement and Enhancing Resilient Rearing Practices | | | | | |
| C.1 | Promotion of Scientific Feeding Practices | | | | | |
| C.1.1 | Ration Advisory Services | Sustainable livelihood of the milk producer | Livelihood | Number of SC/ ST other vulnerable population engaged under this sub-project | Yearly | PMU |
| | | GHG emission | GHG emission reduction | Number of new milk producers comes under Milk Union | Yearly | PMU |
| | | Vulnerability (SC, ST, and vulnerable group). | Grievances on non-inclusion of SC, ST, and vulnerable group in recruitment of LEO | Number of grievances raised in DCS | Yearly | PMU |
| C.1.2 | Calf Rearing Programme (CRP) for buffalo & cow calves | Land based livelihood of landowners and land users | Refer to B.1.5 | Refer to B.1.5 | | |
| | | Ground water resources | Refer B.3.2 | Refer B.3.2 | | |
| | | Water quality & aquatic ecology | Refer B.3.2 | Refer B.3.2 | | |
| C.1.3 | Village level producers' institutions based TMR Plant | Land based livelihood of landowners and land users | Refer to B.1.5 | Refer to B.1.5 | | |
| | | Ecology & biodiversity | Refer to B.1.5 | Refer to B.1.5 | | |
| | | Occupational health & safety | Occupational health & safety arrangement | Provision of PPE | | |
| | | Job and economic opportunities | Refer to B.1.5 | Refer to B.1.5 | | |

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|---------|---|---|--|--|----------------------|------------------------|
| | | Sustainable livelihood of the milk producer | Refer to C.1.1 | Refer to C.1.1 | | |
| C.2 | Demonstration of Fodder Production & Conservation Technology | | | | | |
| C.2.1 | Setting up of Fodder Seed Processing Plant | Sustainable livelihood of the milk producer | Refer to C.1.1 | Refer to C.1.1 | | |
| | | Occupational health & safety | Occupational health & safety arrangement | Provision of PPE | | |
| C.2.3 | Demonstration of community level green fodder production | Sustainable livelihood of the milk producer | Refer to C.1.1 | Refer to C.1.1 | | |
| | | Ground water resources | Refer B.3.2 | Refer B.3.2 | | |
| C.2.4 | Demonstration of Biomass Management Technologies | Training and awareness of dairy farmers | Use of biomass management technologies | Increase the coverage of use of biomass management technologies at field level | Yearly | PMU |
| C.2.5 | Pilot on Mobile Fodder Seed Processing Unit | Job and economic opportunities | Use of fodder seed | Number of small farmers comes under this program | Yearly | PMU |
| C.3 | Pilot on control of Bovine Mastitis & EVM | | | | | |
| C.3.1 | Pilot on control of Bovine Mastitis | Sustainable livelihood of the milk producer | Vaccination program success rate | Number of animal vaccinated under this program | Yearly | PMU |
| C.3.2 | Pilot on propagation of Ethno-Veterinary Medicine (EVM) for bovine ailments | | | | | |
| C.4 | Manure Value Chain Development Programme | | | | | |
| C.4.1 | Establishing Gobar gas Clusters | Alternative energy | Use of alternative use by the farmers | Number of farmers installed the bio-gas plant | Yearly | |

| Sl. No. | Component & Sub-components | E&S Aspects | E&S Performance/ Quality Indicator | Monitoring Parameter | Monitoring Frequency | Primary responsibility |
|---------|--|---------------------------------|--|--|----------------------|------------------------|
| C.4.2 | Pilot on establishing slurry processing centres | | | | | |
| C.5 | Pilot on Solar Energy solution for dairy | | | | | |
| C.5.1 | Pilot on Rooftop Solar PV System at DCS/MMP | Alternative energy | Use of alternative use by the farmers | Number of facility installed the solar system and percentage of energy savings | Yearly | PMU |
| C.5.2 | Pilot on Augmentation of BMC with solar powered instant milk chiller | | | | | |
| C.6 | Pilot on evolving Green House Gas (GHG) mitigation Strategies | | | | | |
| C.6.1 | Pilot on measurement of Methane emissions in Progeny Testing (PT) projects | GHG reduction | Initiation of GHG reduction measures | Number of facilities initiated the GHG reduction measures | Yearly | PMU |
| C.6.2 | Pilot on development of feed additives for methane mitigation | | | | | |
| C.6.3 | Climate Smart Dairying – Pilot on evolving mitigation strategies for Carbon Foot print of dairy sector | | | | | |
| D. | Component D: Project Management and Learning | awareness and capacity building | Implementation of Project Management and Learning system | Number of facilities initiated the Project Management and Learning system | Yearly | PMU |

8.4.6 Capacity Building and Training

NDSP II Project has identified that making available skilled and trained human resources at the right time will be critical to successfully implement NDSP II within given timelines. This would include:

- Taking stock of currently available talent,
- Identifying additional requirement,
- Reorientation, induction and training,
- Building institutional capacity in POIs
- Involving key stakeholder organizations through suitable IEC campaigns,
- Facilitating induction of required professionals/ talent and its adequacy to meet the human resources requirements of the project.

Aligning with the project plan, a preliminary capacity building and training framework from an E&S management perspective is outlined at **Table 7.3**.

The capacity building suggested in ESMF will feed into the larger Project level Capacity Building programme. It should be flexible enough to be able to take feedback from the findings of Monitoring and Evaluation (M&E) exercise and able to address the concerns identified in M&E reports.

Table 8.3 Capacity Building and Training Framework for NDSP-II

| Target Group for Training | Subjects for Training | Type, Frequency and other Details |
|--|--|---|
| CPSC and PSC Members | <ul style="list-style-type: none"> ■ Emerging global sustainability issues in the Dairy sector ■ Climate change adaptation ■ Green initiatives in the dairy sector ■ Project Management | <ul style="list-style-type: none"> ■ International/ National training programs to be delivered by global dairy sector experts/agencies practising sustainability in Dairy sector ■ Frequency of training to be at least once during Project period ■ Type of training - Class room, Conferences, Workshops and Field visit demonstrations |
| Project Management Unit/Technical Support Unit | <ul style="list-style-type: none"> ■ Emerging global and national sustainability issues in the dairy sector; ■ Occupational Safety and Health; improving working and health conditions in Agricultural projects ■ Gender mainstreaming ■ Climate change adaptation ■ Green initiatives in the dairy sector ■ Project Management ■ Public procurement ■ Monitoring and Evaluation ■ Impact evaluation of policies/Programmes ■ Labour Laws/international labour standards ■ Social inclusion in development projects | <ul style="list-style-type: none"> ■ International and National Training programmes. ■ Training programs to be delivered by global/national experts/agencies ■ At least one training programme related to the work area of the workforce involved in NDP II. ■ Type of training - Class room, Conferences, certificate programmes, Workshops and Field visit demonstrations |

| Target Group for Training | Subjects for Training | Type, Frequency and other Details |
|--|--|--|
| | <ul style="list-style-type: none"> ■ World Bank Environmental and Social Standards and that are applicable to dairy sector; ■ Monitoring and reporting requirements under a WB funded Projects; ■ National regulations on E&S issues and that are applicable to dairy sector; ■ Communication and IEC, specially if work is to be carried out in sensitive areas like tribal habitations/regions ■ Developing and Use of the Codes of Practice. ■ Participatory M & E vis a vis social and environmental issues and impacts | |
| <p>POIs and State Government agencies coordinating with POIs</p> | <ul style="list-style-type: none"> ■ World Bank Environmental and Social Standards and that are applicable to dairy sector ■ Monitoring and reporting requirements under a WB funded projects ■ National regulations on E&S issues and that are applicable to dairy sector ■ National regulations on E&S issues and that are applicable to dairy sector; ■ Stakeholder Engagement Plan (SEP) applicability and its implementation in the filed; ■ Indigenous People Planning Framework (IPPF) applicability and its implementation in the field; ■ Resettlement Policy Framework (RPF) applicability and its implementation in the field; ■ Tools and participatory methods to promote the ESMF strategies of inclusion, transparency and participation. ■ Communication and IEC, specially to work in sensitive areas like tribal habitations/regions ■ Developing and Use of the Codes of Practice. ■ Participatory M & E vis a vis social and environmental issues and impacts | <ul style="list-style-type: none"> ■ Training programs to be delivered by global/national dairy sector experts/agencies practising sustainability in Dairy sector ■ Frequency of training to be at least thrice during project period – start, mid-term and EOP aligned with term assessment outcomes. ■ Type of training - Class room, Conferences, Workshops and Field visit demonstrations |
| <p>Milk Producers/ Related Groups</p> | <p>As identified in Project ESMF</p> | <ul style="list-style-type: none"> ■ As defined under Project ESMF ■ IAs and other identified agencies to deliver training and IEC campaigns ■ IEC campaign management plan to be made part of IAs Final Plan and Proposal document to NDDB |

| Target Group for Training | Subjects for Training | Type, Frequency and other Details |
|---------------------------|-----------------------|--|
| | | <ul style="list-style-type: none"> ■ On-site campaigns and Field demonstration visits |

8.4.7 Reporting

NDSP-II Project PMU will prepare a six monthly ESMF monitoring report summarizing monitoring, inspection and V&V outcomes as well as details of any environmental and social non-compliances and actions taken/recommended as required.

8.5 Budget for ESMF Implementation

The implementation schedule has been detailed in environmental and social impact mitigation/enhancement matrix.

Sufficient funds would be allocated to the sub-project specific E&S interventions. Currently about 1% of overall project cost has been earmarked towards implementation of environmental and social measures including health and safety for the entire NDSP II. The funds sufficiency for E&S under NDSP II would be reviewed during the mid-term assessment of the project. The shortfall, if any, would be met by re-appropriation of available funds at that time.

Tentative cost of implementing the ESMF is provided in the table below:

| Sl. No. | Item | Estimated cost (Rs. Lakh) |
|---------|---|---------------------------|
| 1 | Implementation of Gender Based Violence/Sexual Exploitation Abuse/Sexual Harassment (SEA/SH) Prevention and Response Plan | 20 |
| 2 | Occupational Health and Safety (barricading, signages, security tape, boots, gloves, barriers, PPE, Training, etc.) Labour Management Procedures and Working Conditions | 50 |
| 3 | IEC campaigns to increased awareness among milk producers at the household level to enhance the quality of milk and milk products and public health – IEC material, awareness program and implementation monitoring | 100 |
| 5 | Implementation of Implement Stakeholder Engagement Plan (SEP)- training, formulation of GRM/ periodic monitoring | 170 |
| 6 | Implementation of Resettlement Policy Framework (RPF), in case of procurement (direct purchase / lease) of land | 50 |
| 7 | E&S Team, monitoring and evaluation, field visits | 400 |
| 8 | Implementation of material measures that may be required during implementation | 200 |
| 9 | Capacity Building and Training | 200 |
| | TOTAL | 1190 |

Note: Budget is estimated; actual will be revised based on cost estimates from proposals and action plans

APPENDIX A: SELECTED DISTICS FOR THE STUDY

Figure 1: Selected Districts of Himachal Pradesh

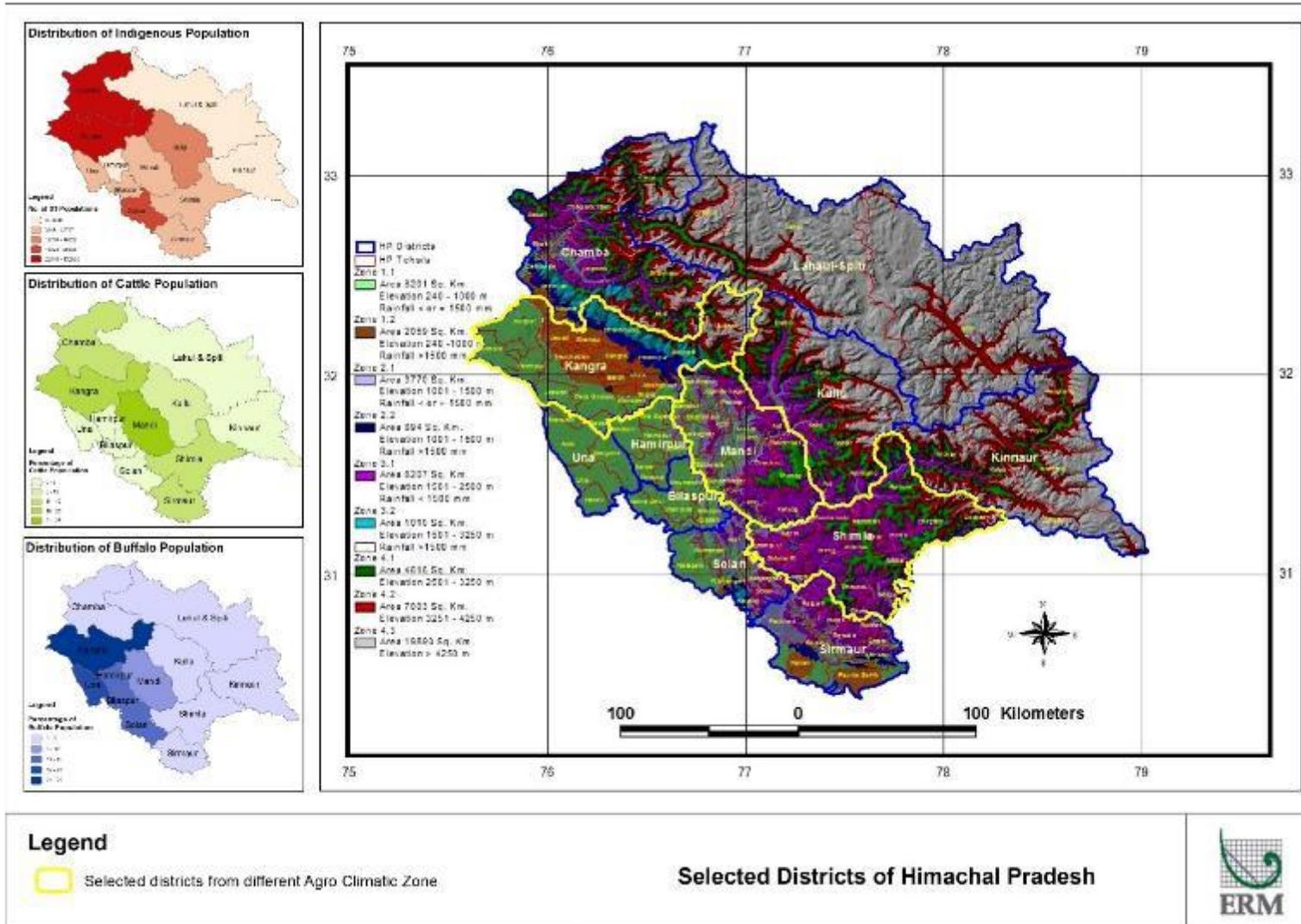


Figure 2: Selected Districts of Uttarakhand

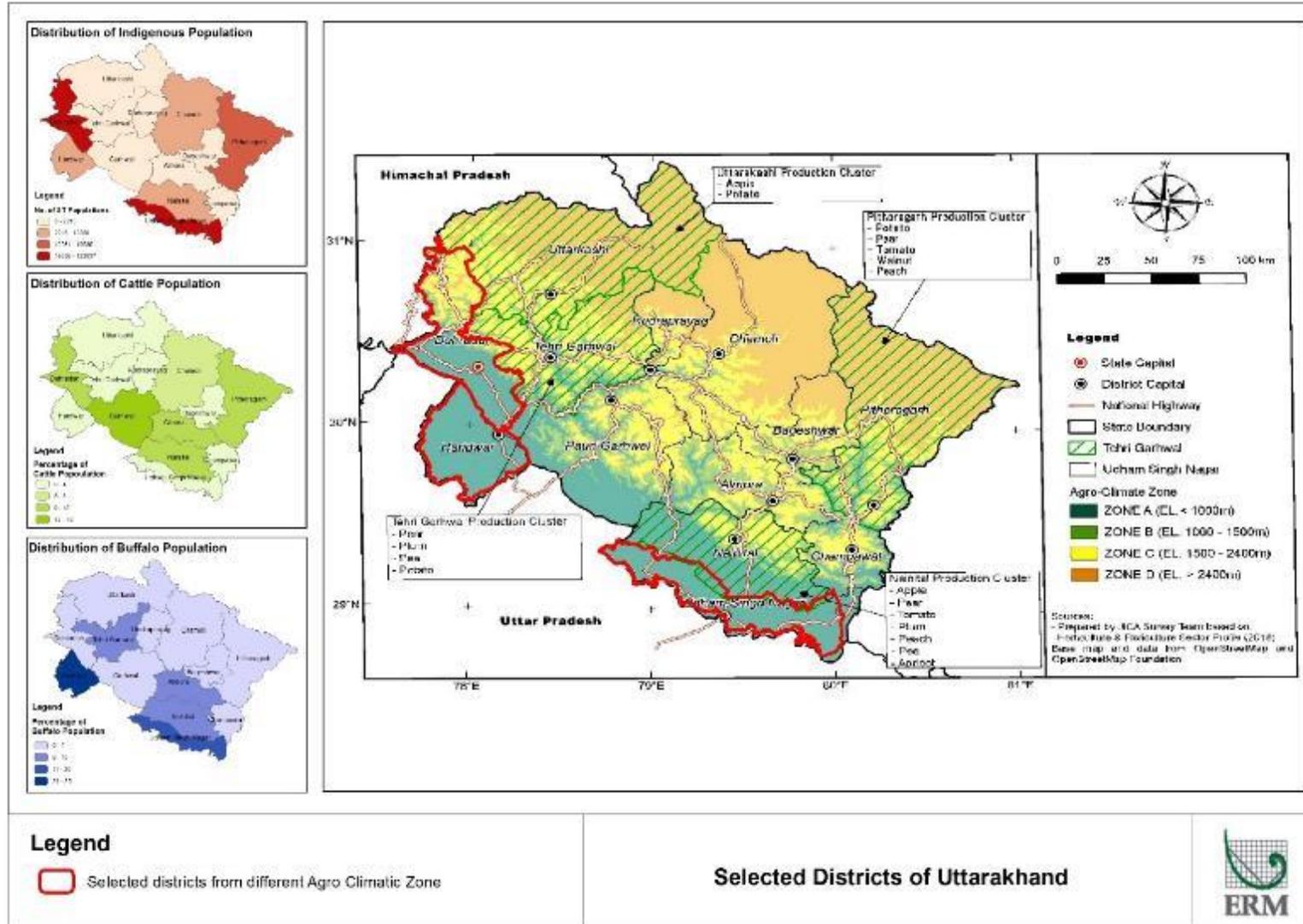
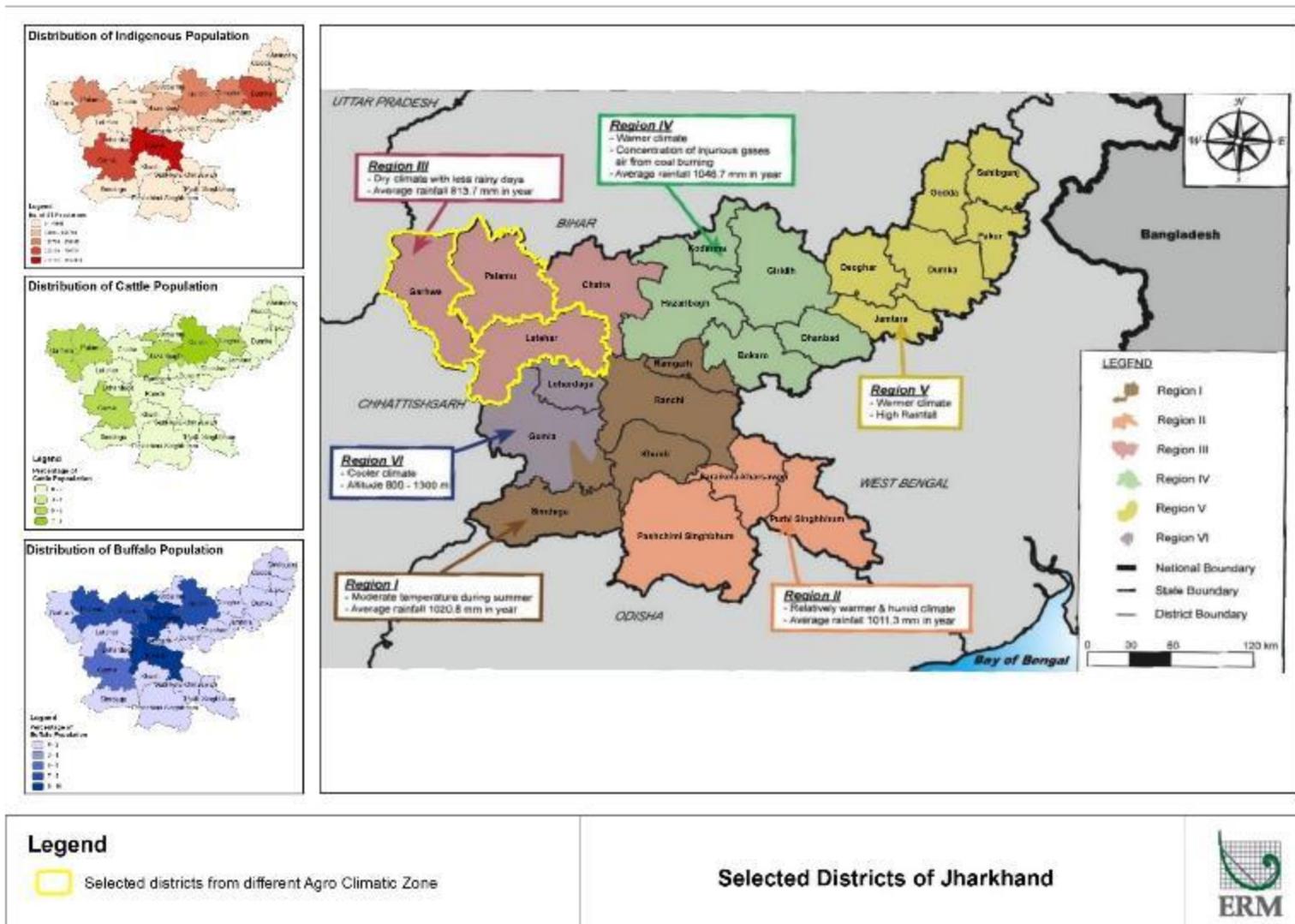


Figure 4: Selected Districts of Jharkhand



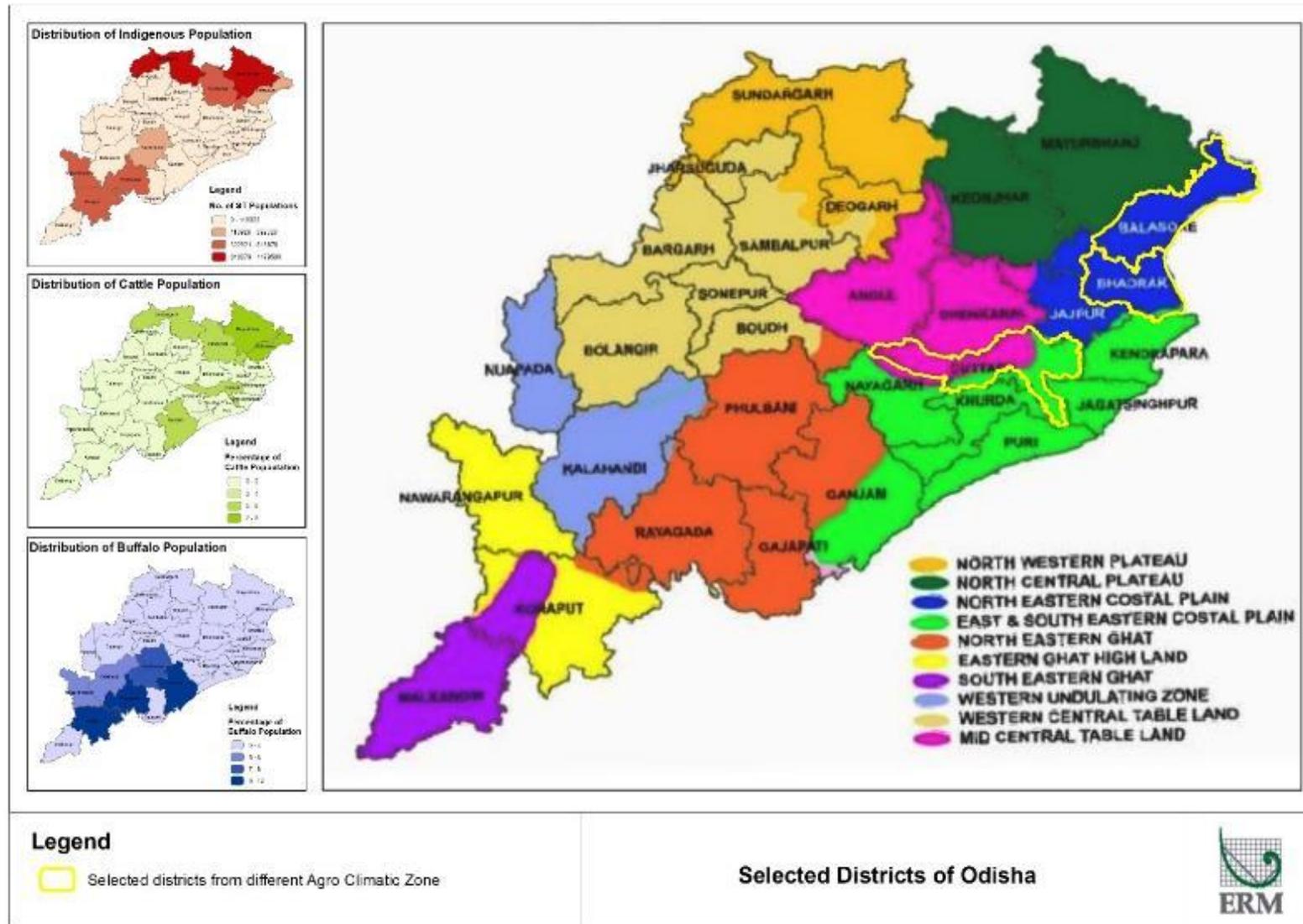
Legend

Selected districts from different Agro Climatic Zone

Selected Districts of Jharkhand



Figure 5: Selected Districts of Odisha



APPENDIX B: LIST OF STAKEHOLDERS AND CONSULTATION TOOLS

| Level | Stakeholder | Tool |
|--------------|---|-----------------------|
| Village | <ul style="list-style-type: none"> ■ Dairy Farmers ■ Women involved in Dairy Business and Women-led SHGs ■ Indigenous People involved in Dairy Business ■ Milk Vendors/Dudhias ■ Dairy Cooperative Societies (DCS)/Milk Pooling Point (MPP) ■ Biogas/Manure Management Plant | FGD Discussion Format |
| District | <ul style="list-style-type: none"> ■ Milk Producers'/Sellers' Unions ■ NGOs/Krishi Vigyan Kendras ■ Veterinary Hospitals/ Veterinary Doctor ■ Food Inspectors/FSSAI office ■ Chilling Plants/BMC ■ Milk Wholesalers/Retailers ■ Milk Processing Plants/Dairy Plant ■ Cattle Feed Plant/Seed Processing Plant/Other related plants ■ Bulk Vending Machine | FGD Discussion Format |
| State | <ul style="list-style-type: none"> ■ Milk Federations ■ Government Departments (Animal Husbandry and Dairying/Agriculture) ■ Milk Commissioner ■ Cooperative Registrar ■ Institutes conducting courses and research on Animal Husbandry/Dairying (e.g. ICAR) ■ Veterinary Colleges | FGD Discussion Format |

APPENDIX C: DAIRY SECTOR BASELINE

Dairy Sector Baseline

Livestock Population

India's livestock sector is one of the largest in the world. About 20.5 million people depend upon livestock for their livelihood. Livestock contributed 16% to the income of small farm households as against an average of 14% for all rural households. Livestock provides livelihood to two-third of rural community. It also provides employment to about 8.8 % of the population in India. India has vast livestock resources. Livestock sector contributes 4.11% GDP and 25.6% of total Agriculture GDP.

Economic Survey 2020 noted that livestock sector has grown at a compound annual growth rate of 7.9 per cent during last five years. As per the Economic Survey-2021, the contribution of Livestock in total agriculture and allied sector Gross Value Added (at Constant Prices) has increased from 24.32% (2014-15) to 28.63% (2018-19). Livestock income has become an important secondary source of income for rural families and has assumed an important role in achieving the goal of doubling farmers' income. The state wise livestock population has been presented in **Table 1**.

Table 1: State wise Livestock (Cow and Buffalo) Population

| S.No. | State | Total Cattle Population | |
|-------|----------------|-------------------------|----------------------------|
| | | Cow ('000 Nos.) | Female Buffalo ('000 Nos.) |
| 1 | Uttarakhand | 822 | 496 |
| 2 | Himachal | 932 | 369 |
| 3 | Odisha | 3,194 | 152 |
| 4 | Jharkhand | 3,458 | 435 |
| 5 | Madhya Pradesh | 7,342 | 5,296 |

Source: Census 2019

As per 19th livestock census 2012 total cattle and buffalo population in India was 299.6 million (cattle 190.0 million, buffalo 108.70 million) and as per 20th census 2019 it was 303.31 million (cattle 193.46 million, buffalo 109.85 million) and total growth rate is 1.24%.

The latest livestock numbers in the country show a sharp increase in cross-bred and indigenous female cattle population, with an accompanying rise in the number of milch animals. According to the 20th Livestock Census, the total cattle population has risen marginally, after falling in previous years. And, an earlier slide in indigenous (desi) cattle population has been stymied after 2012.

The increase was mainly driven by a sharp increase in cross-bred cattle that give higher milk quantities and also due to a higher female indigenous cattle population. The number of cross-bred cattle has risen from 118.57 million in 2012 to 192.53 million, an increase of 73.96%. The indigenous female cattle population rose 18.1% from 122.9 million in 2012 to 145.12 million.

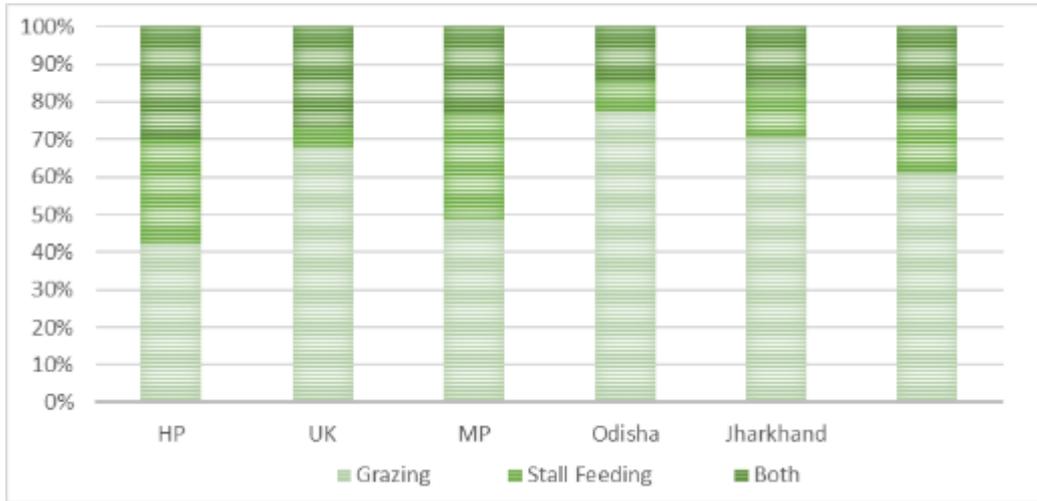
Cross-bred animals contributed around 28 % to India's total milk production of 188 million tonnes in 2018-19.

Fodder and Feeding Practice

Feeding Practice

Generally, three types of feeding viz., grazing, stall feeding or both, are being practiced by the HH. Out of these, grazing is found to be the most common practice (62%) across all surveyed States. However, there are instances of stall feeding (16%) as well as both grazing and stall feeding together (22%).

Figure 1 Types of Feeding Practices across the Surveyed States

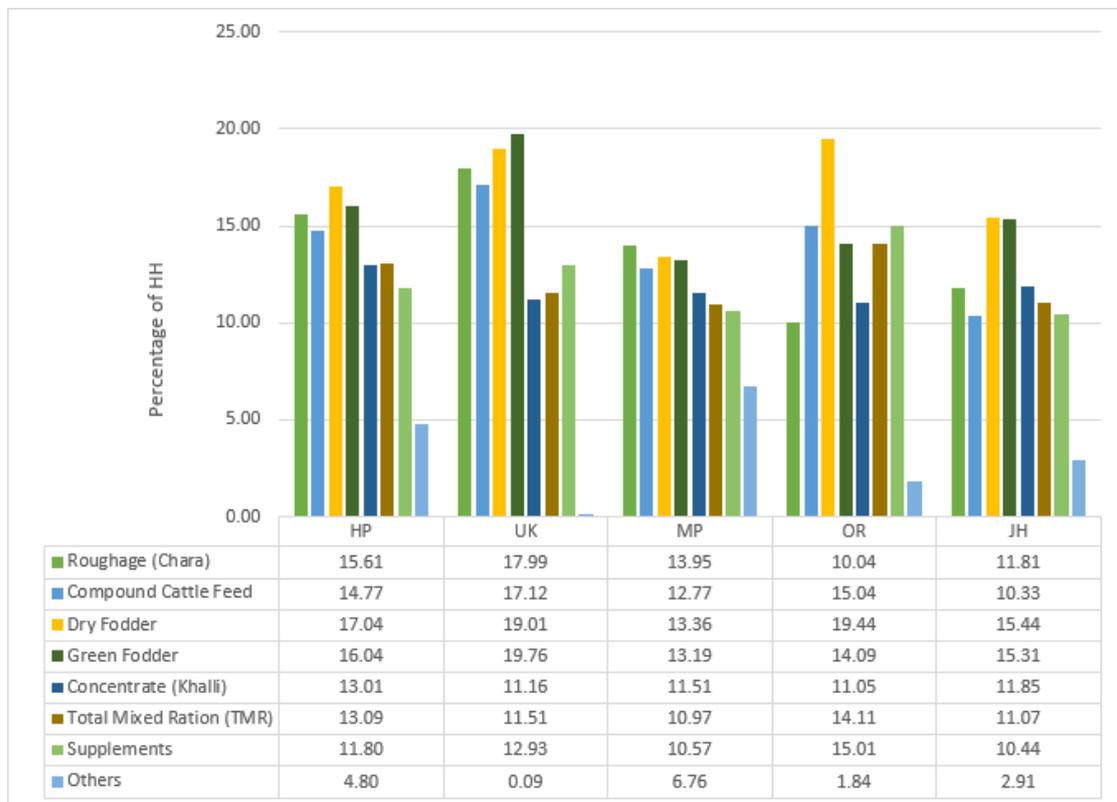


Source: ERM Household Survey 2022-23

Feed and Fodder Types

Crop residue is the largest bulk feed material accessible to the farmer, followed by by-products and grazing lands. However, they are a poor source of nutrition for dairy animals. Following Figure 2 provides an illustration of the composition of livestock feed in the surveyed States. As per the household survey, in 90% cases all types of fodder and feeds are available locally.

Figure 2 Types of Fodder and Feeds used across the Surveyed States



Source: Household Survey

Scientific Feeding

The ration balancing practice in the surveyed HH has been presented in the following table. The awareness about ration balancing in Himachal Pradesh is low (3.93% of the surveyed HH) and higher in Jharkhand (23.2%). Access to ration balancing is also low in Himachal Pradesh (4.4%) and the highest in Jharkhand (25%).

Table 3: Ration Balancing Practice in surveyed HH level

| No. | S. | States | Awareness about Ration Balancing | Access to Ration Advisory Service | Access to Ration Advisory Services (%) |
|-----|----|------------------|----------------------------------|-----------------------------------|--|
| 1 | | Uttarakhand | 12.46% | 12.33% | 42.33 |
| 2 | | Himachal Pradesh | 3.93% | 4.4% | 62.33 |
| 3 | | Odisha | 19.00% | 18.2% | 39.27 |
| 4 | | Jharkhand | 23.20% | 25% | 49.53 |
| 5 | | Madhya Pradesh | 22.13% | 21.4% | 6.27 |

Source: ERM Household Survey 2022-23

Fodder Production & Conservation Technology

Green and dry fodder are important components of animal ration and contribute between 50-60% to the total Dry Matter Intake (DMI) of dairy cattle. The status of the fodder availability has been discussed as follows.

Himachal Pradesh

Green fodder is only available for six months in HP. For the other six months, dry fodder is being used and has been purchased from the market. Main crops being used as green or dry fodder in HP include *turi*, *jowai*, *Basrseem*, *makkhan grass*, *chari*, *bajra*, and *makka*. The following concerns were raised by the farmers about the availability of fodder:

- The steep rise in prices of fodder is a challenge for small and marginal dairy farmers
- 90% of farmers in HP have a landholding of less than 0.5 ha. Further, the landholding is fragmented. This makes it difficult for them to grow too much of fodder.

Uttarakhand

The farmers are able to produce green fodder at their farm and procure cattle feed from the Union at DCS level at fixed rate. The cattle fodder is being produced in the field at the farmer level and it has been sold to other farmers who does not have their own fields.

Madhya Pradesh

The farmers are able to produce green fodder at their farm and procure cattle feed from the Union at DCS level at a fixed rate that is almost like market rates. There are farmers who do not own any land; they are bound to buy green fodder from other landowners in the village itself. The cattle fodder is being produced in the field at the farmer level, and it has been sold to other farmers who do not have their own fields.

Jharkhand

Awareness about green fodder is very less and used by some progressive farmers only who got training and know the importance of green fodder. Fodder Conservation was not observed anywhere in surveyed districts of Jharkhand.

Discussion with institutional stakeholders such as Krishi Vigyan Kendra (KVKs) and Jharkhand Milk Federation (JMF) revealed that various species of green fodder was developed and available for cultivation. Some species needs very low irrigation (sorghum, oats etc.). Perennial grasses like hybrid Napier can provide green fodder throughout the year. Production of hydroponic green fodder with less water requirement can also be adopted by farmers.

Animal Health

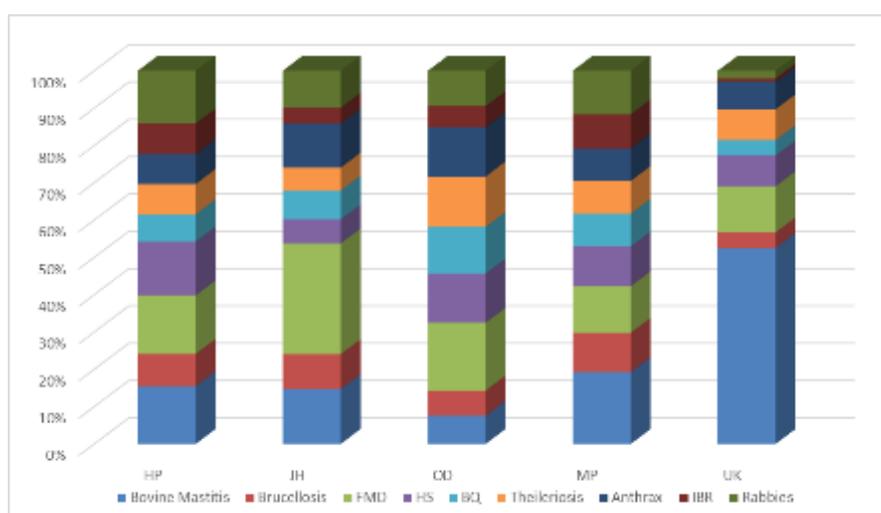
Illness in Animal & Mortality

Animal health is a prerequisite for efficient livestock production. Infectious disease and husbandry-related conditions cause considerable mortality and impact negatively on growth rates, milk yields, etc. It has been observed that five states have a total of 20,674 milch animals (in surveyed households), and out of them, 4398 milch animals have fallen ill in the last three years. In Himachal Pradesh, 69% of the total dairy animals have fallen sick, and about 56% of the total dairy animals have died in the last three years. In Jharkhand, 9.77% of total dairy animals became ill in the last three years, and approximately 33% of dairy animals died. Only 19% of total milch animals in Madhya Pradesh got illness, but the mortality rate of illness milch animals is very high, i.e., 67% in the last three years. And 18% and 20% of total milch animals in Uttarakhand and Odisha have fallen sick in the last three years, and among these, 69% and 45% of milch animals die.

Occurrence of Diseases

It was observed that among the total milch population, foot and mouth disease is the most common disease that occur to milch animal (66%), followed by Haemorrhagic Septicaemia (52%) and the least common disease occurred to milch animal is IBR (28%). The below graph shows that most of the milch animal in Madhya Pradesh and Uttarakhand are affected by Bovine Mastitis. In Himachal Pradesh, Jharkhand and Odisha most of the milch animal affected by foot and mouth disease.

Figure 4 Occurrence of Disease



Source: ERM Household Survey, 2022-23

Disease Prevention and Cure

Overall, around 31% respondent received treatment at a government facility and around 58% respondents are highly satisfied with the treatment facility provided by government. In HP, 8.33%, JH 0.33%, MP 11.4% and in Odisha only about 10.47% respondents received treatment at a government hospital. Around 41% of total respondents stated that they have veterinary services available in their villages which conclude that the villages do not have adequate number of veterinary services and among this total percentage, around 69% respondents in OD getting the veterinary service which is highest among five states followed by HP (53.6%), MP (45.33%), UK (23.13% and JH (16.2%). And same thing came up during the interview with veterinary hospital staff during the site visit. As per the officials of veterinary hospital, there are only one veterinary hospital for every thirty villages.

To understand the existing program towards control of bovine mastitis and EVM in the five targeted states, stakeholder consultation has been conducted and same is listed below:

Himachal Pradesh

Currently, treatment and medication are provided by veterinary dispensaries and hospitals. Though EVM is in the R&D phase at the Veterinary College of HPKV Palampur and in some Krishi Vigyan Kendras, it is not being implemented at the farm level. Treatment with allopathic medicines is expensive, putting farmers out of work.

Uttarakhand

There are mass vaccination drives being held on yearly basis and both window and field facility is available by the veterinary hospitals and dispensaries. Vaccination Drive-FMD,BQ,HS,PPR covered by NADCP

Madhya Pradesh

There are mass vaccination drives being held on yearly basis and both window and field facility is available by the veterinary hospitals and dispensaries. C-Pox vaccine is being used to treat Lumpy skin disease.

There is shortage of man-power (technical staff) in veterinary hospitals. Currently, there is one hospital for 32 villages as far as Shajapur district is concerned. Farmers are reluctant to allow the doctors for multiple vaccination to their cattle. They are afraid of reduction of milk production due to lack of awareness.

Jharkhand

Currently, treatment and medication are being provided by the veterinary dispensaries and hospitals. Private doctors are also there, running their own dispensary. The availability of doctors and technical staff is very low, as observed during the survey. The government doctors assigned to one dispensary were also in charge of the other 4-5 dispensaries nearby, so daily availability at one dispensary was uncertain.

Odisha

The dispensary has provided vaccination for Herpes Mammillitis Virus, Black Quarter, Foot and Mouth Disease, and Anthrax. Vaccination is provided by LIs and private vaccinators (based on incentives) on a daily basis. There are mobile veterinary units that have fixed routes for vaccination (fixed by BVO and approved by CDVO).

Milk Collection and Bulking Facility

Having made a significant stride in production and processing, efforts have been directed to provide hygienically safe milk and milk products to the consumers. In addition to fat and SNF, the bacteriological

quality has also been considered for determining quality of the milk. Therefore, emphasis is on veterinary support infrastructure and strengthening cold chain for quality milk production. As per Codex Alimentarius, immediately after milking, the milk must be cooled preferably to 4° C. This requires mechanical refrigeration or milk cooling tanks. It is important to remember that under a hot environment milk will spoil within 3 to 4 hours. So, cooling will lower the temperature of milk to prevent multiplication of bacteria. Further, when milk for further processing is not used within 2 hours after milking, it shall be cooled to a temperature cooled to or below 4° C.

At the village level, the farmers form a co-operative society, which establishes the 'milk collection centres'. The society collects milk twice a day and delivers it to the milk collection centres where the milk is weighed, tested and the price paid to farmers. The payment is based on fat content or fat + SNF content in the milk. The village society supplies/sells milk to its own District co-operative dairy plant. It transports milk in cans by trucks or through insulated road milk tankers, preferably via a chilling centre. Besides milk collection, the society also provides the technical input services such as the A.I, veterinary aid; concentrated cattle feed and fodder seeds. They also give counselling to the society members to enhance milk production.

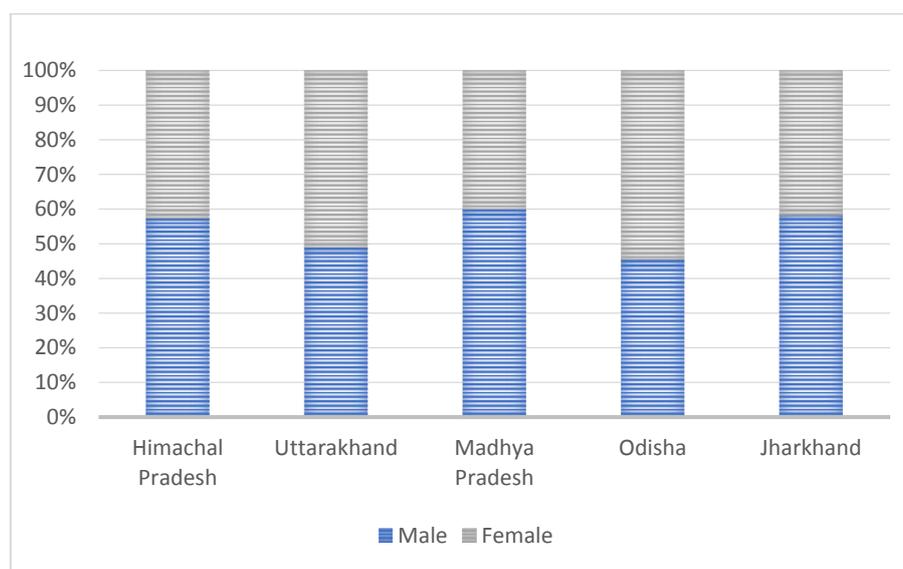
The presence of village-level DCS in the surveyed villages has been presented in the following table: The survey results showed that the presence of DCS in the village and membership in DCS are highest in Odisha and lowest in Jharkhand. The membership in DCS (male or female members) has been presented in following table.

Table 5: DCS Status in the five States

| No. | S. | States | % of respondents says present in the village | % of respondents who want to have DCS in the village | Membership in DCS (%) | Non-member farmers supply milk to DCS (%) |
|-----|----|------------------|--|--|-----------------------|---|
| 1 | | Himachal Pradesh | 28.2% | 43.4 | 33.4 | 38.0 |
| 2 | | Jharkhand | 11.5% | 28.0 | 3.2 | 14.1 |
| 3 | | Madhya Pradesh | 24.0% | 22.6 | 36.6 | 63.6 |
| 4 | | Odisha | 69.6% | 23.2 | 75.6 | 60.9 |
| 5 | | Uttarakhand | 32.7% | 70.1 | 18.2 | 27.6 |

Source: ERM Household Survey 2022-23

Figure 6 Pattern of Dairy Co-operative Membership across the States



Source: ERM Household Survey 2022-23

If the dairy plant is far away from the collection centre, then the collected milk is first brought to a centralized chilling centre/ bulk milk cooling unit. Here, milk is cooled to 4°C and stored in insulated storage tanks of 5000-20,000 L capacity. Subsequently, the chilled milk is transported in insulated Road milk tanker to the dairy plant. The transportation of milk from the chilling centre to the dairy plant usually takes place once a day.

Fat and SNF are two major constituents of milk which are considered for price fixation. The '2-axis pricing policy' gives importance to both fat and SNF; the per Kg (rate) price of fat and SNF are fixed in that ratio at which these occur naturally i.e. around 2/3 of fat per kg price for each kilogram of SNF. This type of pricing discourages adulteration. Basic price is fixed for basic composition and for each 0.1 additional value, bonus is added and for shortfall deductions are made.

Presence of village or co-operative level milk processing center has been presented following table:

Table 4: Presence of village or co-operative level milk processing centre

| State Name | Presence of village or cooperative milk processing centre |
|------------------|---|
| Himachal Pradesh | 29.4% |
| Jharkhand | 21.4% |
| Madhya Pradesh | 33.7% |
| Odisha | 70.1% |
| Uttarakhand | 4.4% |

Source: ERM Household Survey 2022-23

Bulk Milk Cooling Tanks

These tanks when loaded with milk can cool it down from 30°C to 4°C in 3 hours. The tanks are available in 250 L, 500 L, and 2 to 5 KL capacity. The integral condensing unit is hermetically sealed and uses R-22 refrigerant. These are built with stainless steel and with agitator assembly, on/off switches for agitator and, cooling and digital display of temperature. A model is available which claims that it senses

the quantity of milk in tank and proportionately switches on the required refrigeration system, saving energy.

The best alternative to the present collection system of milk is cooling of milk immediately after milking by Bulk Cooling Tanks. The usage of such tanks has become popular and is on the rise as it helps in increasing the shelf life of milk, facilitates systematic and simple way of milk procurement and ensures procurement of more milk by covering untapped farther areas for Milk Collection. Further the efforts are aimed at setting up of collection centres along milk routes to increase procurement in the organized sector and to facilitate scientific handling of milk as per quality norms.

Calf Rearing at Farmer Level

Dairy farmers in India suffer economic losses due to high calf mortality, delayed sexual maturity of female calves, higher Age at First Calving (AFC) and long inter-calving periods. In Indian conditions, the average 'Age at First Calving' is 42-51 months in indigenous cows and 43-47 months in buffaloes (as per the National Bureau of Animal Genetic Resources). This can be significantly reduced to about 30-35 months in both cows and buffaloes through scientific feeding and management of calves at their different stages of growth including the foetal stage.

The scientific calf rearing practice in the surveyed HH has been presented in the following table. The survey results showed that awareness and training level about scientific calf rearing in Utrakhnad Himachal Pradesh and Jharkhand was low 3.2% to 6.2%. The awareness level and training on scientific calf rearing in Odisha and Madhya Pradesh is comparative higher, about 25%.

Table 5: Calf Rearing Practice in surveyed HH level

| No. | S. | States | Awareness about scientific calf rearing | Training on scientific calf rearing |
|-----|----|------------------|---|-------------------------------------|
| 1 | | Himachal Pradesh | 6.2% | 3.6% |
| 2 | | Jharkhand | 3.2% | 1.2% |
| 3 | | Madhya Pradesh | 25.4% | 12.13% |
| 4 | | Odisha | 25.5% | 26% |
| 5 | | Uttarakhand | 5.4% | 3.2% |

Source: ERM Household Survey 2022-23

Manure Value Chain Development Programme

Manure Value Chain model was developed which focused on establishing “dung” as a commodity by attaching specific value to it. Anaerobic digestion converts cow dung in to methane-rich biogas, and bio slurry which is rich in microbes and micro nutrients. Biogas is used to satisfy energy needs in terms of cooking or electricity. The conversion of dung to bio slurry also ensures cleanliness, odourless surrounding and upkeep of the vicinity fulfilling major objective of Swachh Bharat Initiative.

State wise current practices has been presented in the following sections:

Himachal Pradesh

There is no formal manure management value chain in HP since there is no surplus biomass available from farmers. Some household bio-gas plants that were earlier established were not successful due to a lack of raw materials. The dung produced by cattle is usually sufficient to be used as manure in the farmers' agricultural fields. Those who have a surplus frequently sell it to farmers who do not have enough biomass on hand.

Uttarakhand

There have not been any Manure Value Chain Development taken place. Few traditional biogas plant is present run by an individual at village level.

Madhya Pradesh

There have not been any Manure Value Chain Development taken place. Few traditional biogas plant is present run by an individual at village level. There are no existing biogas plant at DCS and/or Union level.

Jharkhand

The generated biomass (cow dung) from the small household farmers is mainly used in their own agriculture fields. However, the cowdung generated from the farmers having large number of cattle used to sell it to farmers on need basis for use in their agriculture farm.

Odisha

There is a Manure Management Plant at the chiller facility for the past 2 years, the machinery is present but the plant has not yet been made functional

Energy use is Dairy and Renewable Energy

One of the major limitation/ dependencies of BMCs, is the availability of stable Grid power or DG set power for cooling liquid milk. Realistically, availability of stable power in villages, is a problem and hence DCS need an alternate power source viz. operational Diesel Generator (DG) set, which is at least 3 times expensive in comparison to grid power. Additionally, DCS need to incur additional cost in maintenance of DG set, and its accessories over and above the operational expenses. There is also a risk of increase in power tariffs for commercial connections, which directly impacts on the operational expenditure and viability of BMCs.

In HP, the use of renewable energy at the VDCS/BMC or dairy plant level is very limited. Currently, solar water heating solutions are being used only in the cattle feed plant to heat water that goes into a boiler. In Madhya Pradesh, there are few solar heating systems at the Milk Union and Chilling Plant levels. However, there is no utilisation of renewable energy in Uttarakhand, Jharkhand, or Odisha.

Training and Awareness

Training and awareness about animal rearing dairy management of the farmers has been presented in following table. It was observed that the training and awareness level is comparatively better in Madhya Pradesh, Himachal Pradesh and Odisha framers compared to Jharkhand and Uttarakhand.

Table 6: Training and Awareness on Animal raring and Dairy Management

| Training & Awareness field (%) | Himachal Pradesh | Jharkhand | Madhya Pradesh | Odisha | Uttarakhand |
|--------------------------------|------------------|-----------|----------------|--------|-------------|
| Livestock purchase & ownership | 13.46 | 1.26 | 24.7 | 12.8 | 0.06 |
| Dairy Entrepreneurship | 13.13 | 0.8 | 11.6 | 11.6 | 0 |
| AI/Breeding | 12.4 | 0.6 | 13.4 | 8.6 | 0 |
| Vaccinations | 13.26 | 0.4 | 12.5 | 7.7 | 0.2 |
| Disease prevention and control | 14.93 | 0.6 | 21.4 | 9.5 | 0 |
| Feed & Fodder | 12.93 | 0.4 | 9.2 | 7.2 | 0 |
| Milking | 10.93 | 0.5 | 12.2 | 7.5 | 0 |
| Animal Hygiene | 14.2 | 0.6 | 14.2 | 9.5 | 0 |
| Manure Management | 13.46 | 0.6 | 11 | 6.6 | 0 |

Source: ERM Household Survey 2022-23

It was observed from the survey that most of respondents, i.e. about 63% respondents want to take training on “Animal care and Hygiene”. And whereas 56% and 55% respondents want to take training

on “Milking and milk supply” and “Quality/clean milk production” respectively. And only about 46% respondents are interested to take training on artificial insemination (AI).

APPENDIX D: CONSUMER SURVEY BASELINE

Consumer Survey Baseline

This study aims to identify the major factors influencing the consumers to prefer milk products and to analyse the awareness level of the consumers. In this study the data is obtained through a structured questionnaire from consumers considering convenience sampling under the nonprobability sampling techniques. Survey results are derived from 3000 consumers interviews conducted during study period.

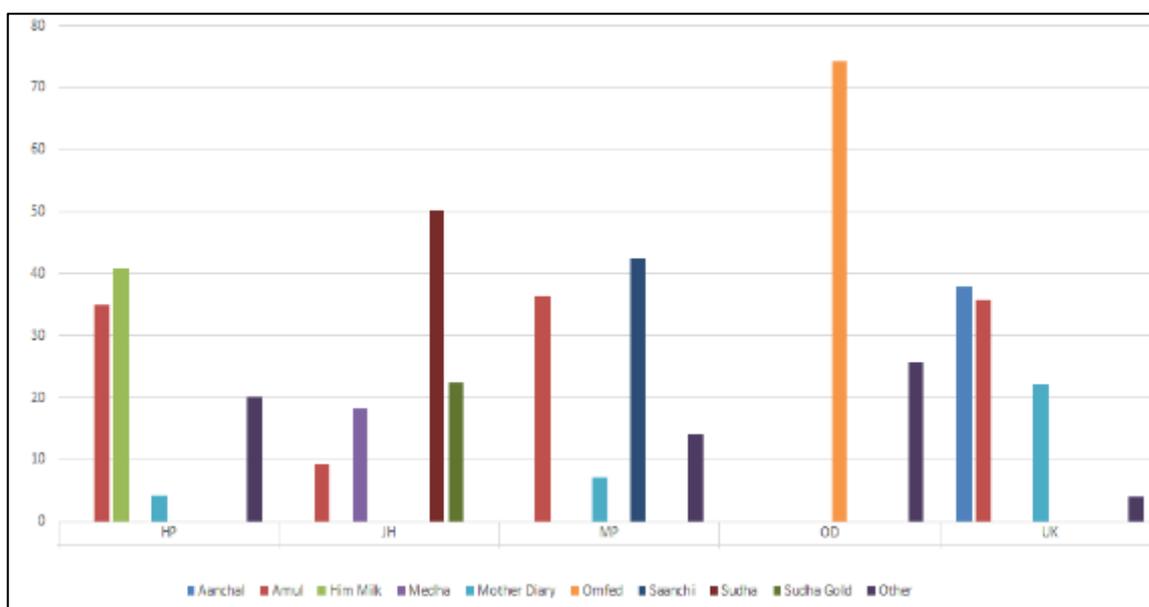
Milk Consumption Details

A total of 3000 nos. consumers were surveyed for this study in five states with 600 nos. of consumers each. The survey shows that an average of 1.34 liters of milk is used at home every day and the more family members, the higher is the amount of milk consumed. About 63% people consume maximum 1 litre of milk per day and 37% of them have maximum two family members. About 43% consumer prefer to buy milk from retail store and 23.8% and 32.83% consumer prefer to buy milk from cooperative owned dairies and local milkman respectively. If we look at this data state-wise, it was observed that most people in Odhisa, i.e., about 82% prefer to buy milk from retailer store and about 41% consumer in MP prefer to buy milk from cooperative owned dairies and in Jharkhand about 71% consumer prefers to buy milk from local milk man.

Nearly 80% consumers who consume milk said they purchase milk on a daily basis, compared with about 7.4% consumers buy milk on an alternative days and 8.63% buy milk 2-3 times in a week and only 3.33% are those consumers who purchase milk once in a week. Adult over age 55 had the strongest preference for milk, with the majority 72% saying they purchase milk on daily basis.

Nearly 53% consumers prefer loose milk over packaged milk and top two reasons for purchase loose milk is freshness (24.16%) and taste (22.5%) followed by ease of availability (9.33%), price (8.5%), adequate supply (6.83%), colour and odour (4.5%) and level of dilution (2.16%). Around 47% people consume packaged milk and their preference is found in almost every state except Odhisa. Around 27% consumers prefer Amul across the five states, followed by Aanchal (13%), Saanchi (12%), Omfed (11%) and Mother Dairy (10%).

Figure 1 Brand Preference across Five States



Source: ERM Consumer Survey 2022-23

People are not familiar with and knowledge about pasteurized milk and its benefits, only 44% people were observed as knowing about the pasteurized milk. Pasteurization is a process by which milk is

heated to a specific temperature for a set period to kill harmful bacteria that can lead to diseases like listriosis, typhoid fever, tuberculosis, diphtheria and brucellosis.

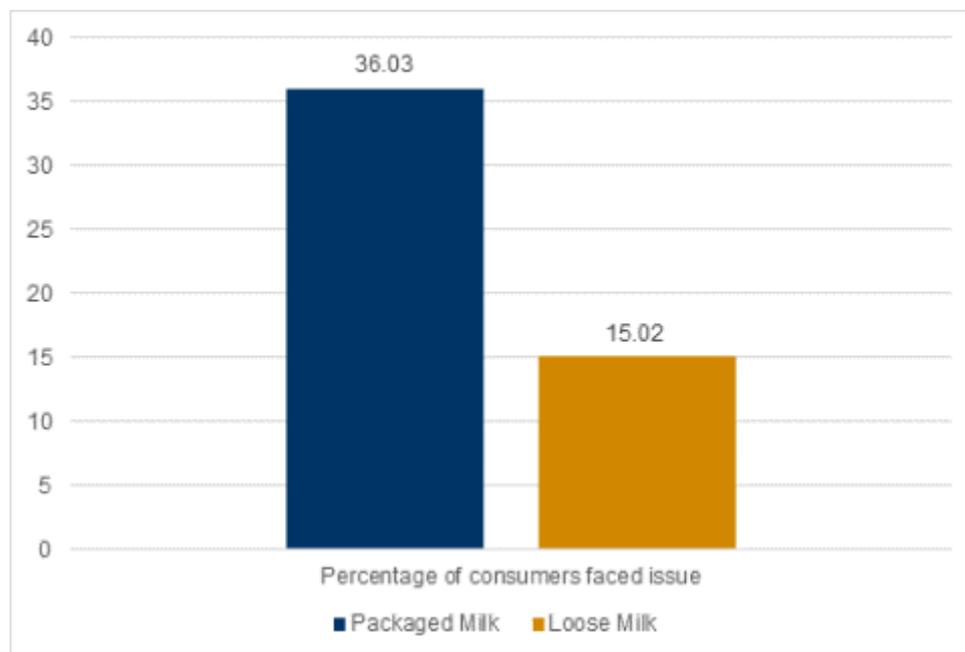
Dairy Product Consumption

People have the strongest preference for diary-based version of ghee, paneer, curd, ice-cream. Almost 95% consumers said they use ghee. While looking at the other products majority of the people use paneer (94%), curd (92%), ice-cream (91%), butter (88%) and cheese (58%).

Quality of Milk and Dairy Products

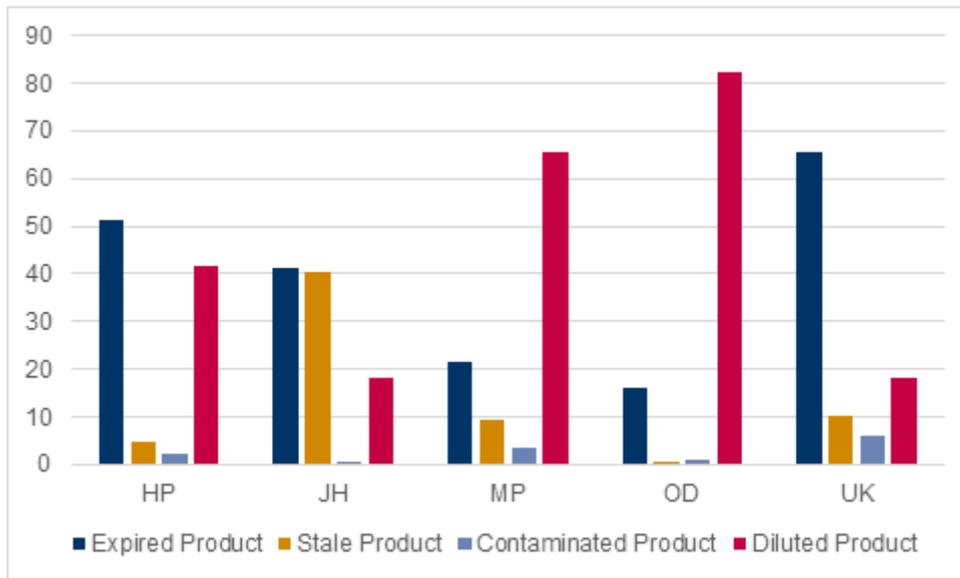
According to the survey, it is understood that those who purchase milk are very happy with the quality of the milk. Only 24% consumers have faced some issue related to quality. The below graph shows that among those consuming packaged milk, 36% complained about the quality issue and 15% of loose milk consumers complained about its quality. Most of the people around 46%, have faced expired product related and diluted product (42%) is the second most quality issue consumers have faced.

Figure 2 Quality Issue in-respect of Packaged and Loose Milk



Source: ERM Consumer Survey 2022-23

Figure 3 Quality Issue faced by Consumers

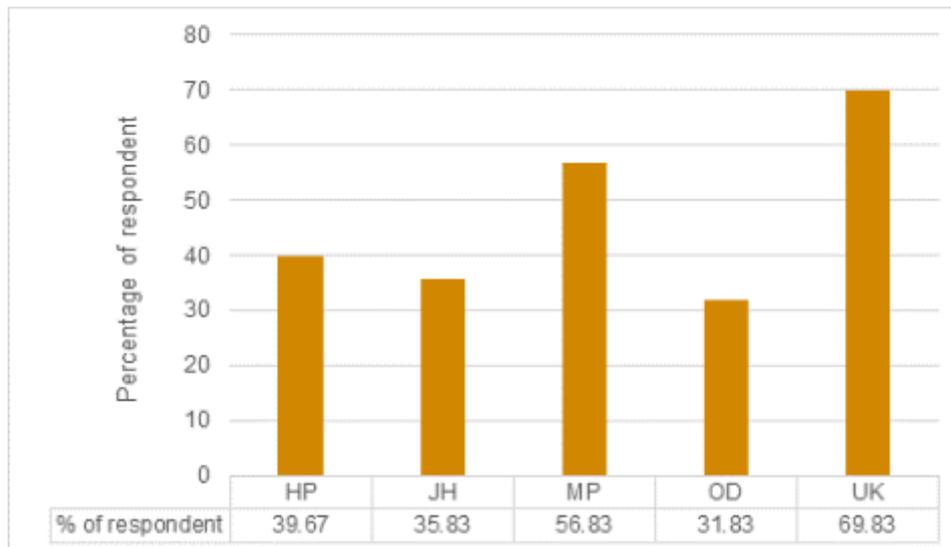


Source: ERM Consumer Survey 2022-23

Management of Milk Pouches

If we look at the overall five states, we can observe that nearly 47% of the respondents know about milk pouches recycling. Uttarakhand is most likely to recycle the milk pouches, where about 69% respondents aware about this followed by Madhya Pradesh where 56% respondents know about the recycling of milk pouches.

Figure 4 Awareness about recycling of milk pouches

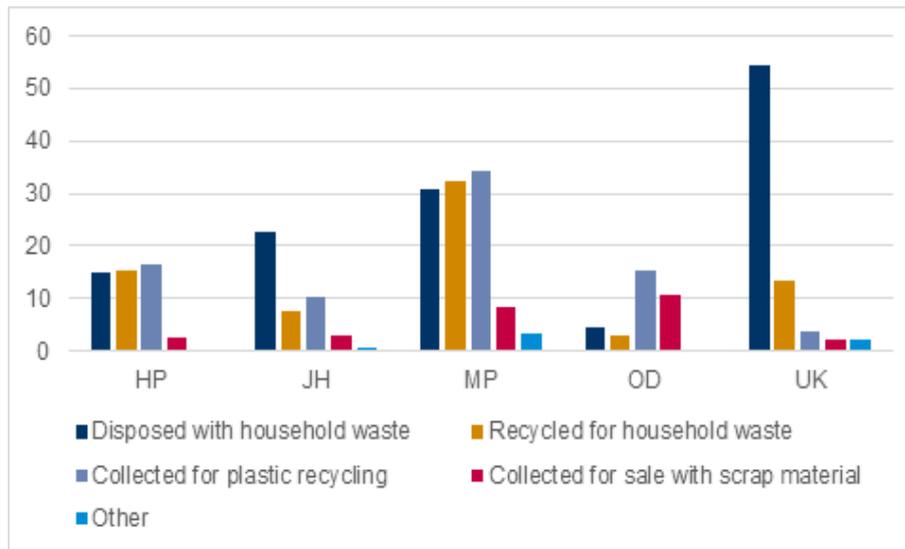


Source: ERM Consumer Survey 2022-23

Disposal method of Milk Pouches

In Madhya Pradesh 34% of respondents collected those pouches for plastic recycling, which is highest among five states. Whereas 30% of the respondents in Madhya Pradesh, 54% in Uttarakhand, 22% in Jharkhand, 14% in Himachal Pradesh and only 4% in Odisha disposed those pouches with household waste.

Figure 5 Disposal method of milk pouches



Source: ERM Consumer Survey 2022-23

APPENDIX E: RETAILER SURVEY BASELINE

Retailer Survey Baseline

Sample Size

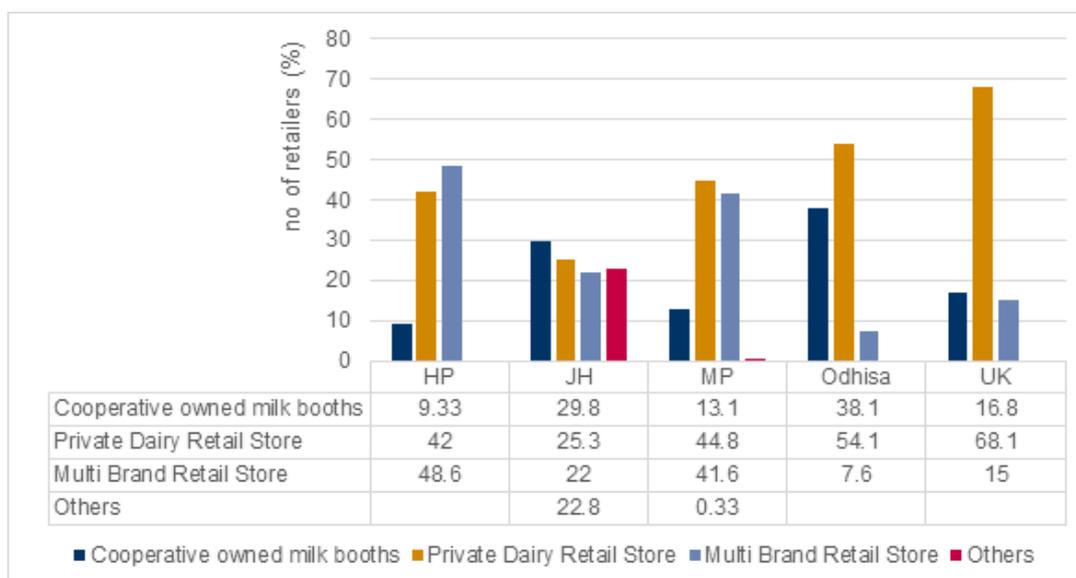
A total of 3000 people were interviewed for this survey. Only 7% of the respondents were female. In the state of Odisha, 8.33% respondents were female, which is highest among other four states.

Type of Retailers

To conduct this survey retailers has been divided into four section, i.e. a. cooperative-owned dairies or milk booths, b. Private Dairy Retail Store, c. Multi Brand Retail Store, d. Others (here others defined as any kind of kiranha or grocery shop).

Out of 3000 retailers, 645 are Cooperative-owned Dairies or Milk booths (21.45%), around 27.03% are Multi-Brand Retail Stores, 46.93% are Private Dairies which is a total of 1408 numbers and only 4% of retailers are grocery or kiranha stores. The higher proportion of Cooperative owned milk booth is 38.1% in the state of Odisha and lowest is 9.33% in Himachal Pradesh. 68.1% Private Dairy Retailer Store found in Uttarakhand which is highest among the five states. And Multi Brand Retail Store is highest in Himachal Pradesh which is 48.6%.

Figure 1 Type of Retailer Stores across Five State

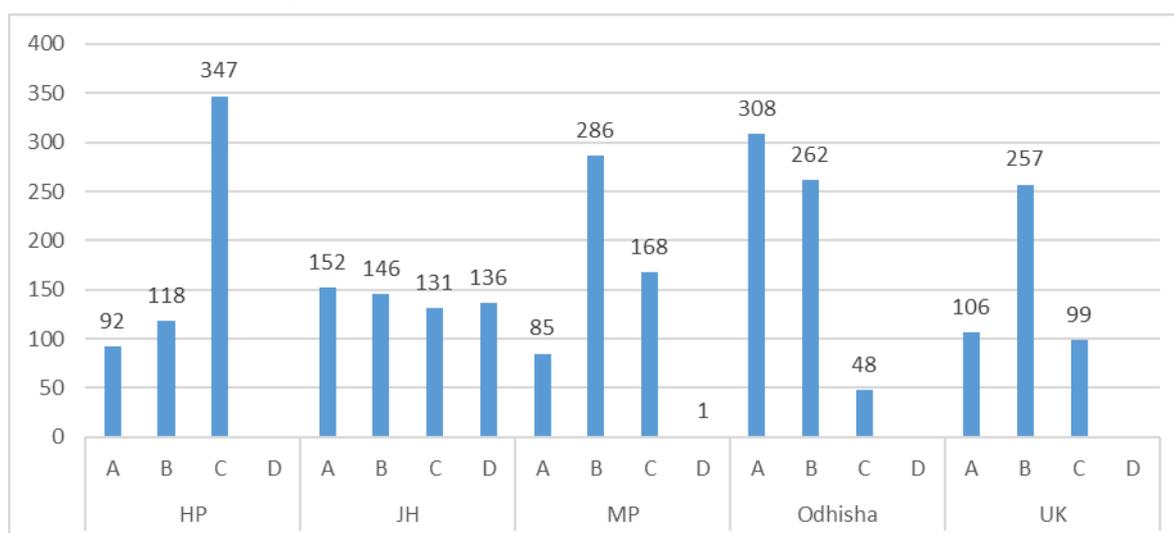


Source: ERM Retailer Survey 2022-23

Numbers of Branches/Outlets

A total of 2742 branches/outlets were identified in all type of retail outlets across five states and these branches are only in the places where the survey has been conducted. This surveys shows that the number of branches of Cooperative owned milk booths is much less than that of branches of Private Dairy Retail Store and Multiple Brand Retail Store. Where there are 1069 nos. of branches (38.98%) of Private Dairy Retail Store, there are only 743 nos. of Cooperative owned milk booths branches. The following graph shows that among these five states, Odisha has the greatest number of Cooperative owned milk booth branches, i.e. 308 nos. and Madhya Pradesh has the least, i.e. 85 nos. 286 nos. of Private Dairy Retailer branches are present in Madhya Pradesh which is the highest among these five states.

Figure 2 No. of Branches of Retailer Stores



Source: ERM Retailer Survey 2022-23

Note: A= Cooperative-owned Dairies, B= Private Dairy Retail Store, C= Multi-Brand Retail Store, D= Others

Milk/Dairy Products Availability

There is no data available which shows the highest milk/dairy product selling brand but from the survey we can get the idea about which brands are easily available in retail shops and from this it can be concluded that which is the most preferred brand. And data not available which shows how many retailers are selling only a particular brand. Most of retailers prefer to keep multiple brands and this is the reason for overlap in values.

Milk

The survey shows that a total of 1086 retailers branch are selling loose milk or unbranded milk, of which Jharkhand is the largest seller (44%) of loose milk or unbranded milk. Among other brands, Amul has the highest market penetration, followed by Mother Dairy. Amul has the highest market penetration in Himachal Pradesh where 71% of retailers shop are selling Amul milk. Data also shows that milk brand such as Amul and Mother Dairy were not able to penetrate Odisha market. In Odisha 71% of the retailers are selling Omfed (Cooperative milk brand) which is highest among other four states.

Curd

Out of 3000 retailers surveyed, curd is being sold by 2501 nos. of retailers across five states. Survey showed that Amul curd preferred by most of the people and that is the reason for availability of Amul Curd in 34% of the retailers shop in five states. Amul has also achieved the highest market penetration in Himachal Pradesh where 53.33% retailers keep Amul curd. And among the Cooperative Diaries, Omfed is available in 36.17% retailers in Odhisa which is highest in five states.

Paneer

Paneer is available in 2160 nos. of retailers surveyed across five states. 49% retailers selling paneer of Amul in Himachal Pradesh which is highest in five states. And the survey also suggest that many government dairies do not produce paneer, same information received at site during the site visit of ERM team. Among the government retailer, Him Milk is available in 31.66% retailer, which is among other government dairies.

Other Dairy Product

Other dairy products such as cheese, ghee, butter, ice-cream, milk based beverages available in 1000 nos., 1777 nos., 1434 nos., 1104 nos., 1249 nos. of retailers respectively. Of the 1777 nos. of retailers who sell butter, Amul butter is available with 971nos. (54.64%) of retailers. Apart from Amul, other government dairy such as Him Milk, Anchal, Saanchi also make butter. Him-Milk is available only in 62nos. of retailer shops in Himachal Pradesh and where as Anchal and Saanchi is available with 53nos. and 86 nos. retailers respectively.

APPENDIX F: IMPACT ASSESSMENT METHODOLOGY

Impact Assessment Methodology

This section identifies and evaluates potential environmental, social (socio-economic) impacts resulting from the proposed NDDB-II projects. The potential impacts are evaluated to assess possible consequences of the project activities to determine the severity and extent of identified potential impacts, and aid in the development of mitigation or enhancement measures to reduce or negate those identified potential impacts.

Identification of Potential Impacts

Identification of potential negative impacts is an objective exercise to determine what could potentially happen to the environment as a consequence of the Project and its associated activities. This effort builds on the identification step in scoping, whereby the potential interactions between the Project and the baseline environment are identified. From these interactions, the potential impacts to the various resources or receptors are identified and are described to the extent possible.

Evaluation of Potential Impacts

Once the identification of potential impacts is complete, each potential impact is described in terms of its various relevant characteristics (e.g., type, scale, duration and extent). The terminology and designations used to describe potential impact characteristics is shown in **Table 6.1**.

Table 1 Potential Impact Characteristic Terminology

| Characteristics | Definition | Designations |
|-----------------|--|--|
| Type | A descriptor indicating the relationship of the potential impact to the Project. | Direct Indirect Cumulative |
| Extent | The “reach” of the potential impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc). | Local Regional National |
| Duration | The time period over which a resource / receptor is potentially affected | Short Term Medium Term Long Term |
| Scale | Concentration of an emission or discharge with respect to standards of applicable legislation and international guidance, potential to be damaged or impacted, the fraction of a resource that could potentially be lost or affected, etc. | Low Medium High |

Magnitude

Once potential impact characteristics are defined, the next step in the impact assessment phase is to assign each potential impact a ‘magnitude’. Magnitude is typically a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- Extent
- Duration
- Scale

Magnitude describes the intensity of the change that has the potential to occur in the resource/receptor as a result of the potential impact. The magnitude designations themselves are consistent, but the definitions for these designations vary depending on the resource/receptor. The magnitude designations are:

-
- Positive
 - Insignificant
 - Small
 - Medium
 - Large

Sensitivity/Vulnerability/Importance of the Potentially Impacted Resource/Receptor

In addition to characterizing the magnitude of a potential impact, the other principal impact evaluation step is definition of the sensitivity/vulnerability/importance of the potentially impacted resource/receptor. There are a range of factors to be taken into account when defining the sensitivity/vulnerability/importance of the resource/receptor, which may be physical, biological, socio-economic. Other factors may also be considered, such as formal legal protection status, government policy, stakeholder views and economic importance. As in the case of magnitude, the sensitivity/vulnerability/importance designations themselves are consistent, but the definitions for these designations vary on a resource/receptor basis. The sensitivity/vulnerability/importance designations used herein for all resources/receptors are:

- Low
- Medium
- High

APPENDIX G: WASTE MANAGEMENT PROCEDURE

1. INTRODUCTION

1.1 Waste Management Context

The dairy operations results in sizeable amounts of solid and liquid wastes when considered in a cumulative manner at the household level with many milch animals. The solid and liquid wastes will be also generated from community milking centres, calf rearing programme (CRP).

The dairy supply chain, including production, processing, packaging, shipping, storage, distribution, and marketing. Milk and dairy products require packaging material made mostly of plastic but also include paper and aluminium foils. Because of the industry's diversity, numerous product processing, handling, and packing processes generate wastes of varying quality and quantity.

The construction and modernisation of milk collection centre, processing unit and dairy plant likely to generate construction waste.

Bio-medical waste likely to generated from the pilot on bovine mastitis control program and EVM .

1.2 Objectives

The objectives of WMP are:

- Ensure measures are identified and implemented to minimise waste, manage waste throughout dairy supply chain.
- Provide staff with an increased level of understanding and awareness of waste and resource use management issues.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements.

1.3 Regulatory Framework and Safeguards

Relevant provisions under the following regulations, guidelines and pertinent standards are applicable towards the implementation of this WMP.

Table 1-1: Applicable Regulation & Guidelines

| Indian Regulation and WB Operational Policies and Procedure | Description |
|---|--|
| Plastic Waste Management Rules, 2016 and amendment 2022 | Waste management in dairy plants is an important aspect to improve the quality. |
| Construction and Demolition Waste Management Rules, 2016 | Construction and Demolition Waste Management plan shall be prepared and implemented. |
| Bio-Medical Waste Management Rules 2016 | The applicability of the act will be limited to Animal Husbandry (AH) activities, especially vaccination under the NDP-II project. |
| ESS 3: Resource Efficiency and Pollution Prevention | It recognizes that economic activity often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. This ESS sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle. |

2. POTENTIAL IMPACTS

2.1 Potential impact on soil, ground water and surface water quality

The waste generated from the community milking centres (feed left, cow dung & urine and sweeping waste), calf rearing facility (feed left, cow dung & urine and sweeping waste) and milk processing plant (Plastic, paper, aluminium foil, and other packaging waste), if disposed in the non-designated area may cause negative impact on soil and ground water quality. The surface runoff from the waste storage and disposal site has potential to cause negative impact on surface water quality of receiving surface water bodies like ponds and rivers affecting aquatic life.

Construction and demolition waste will be generated various construction and modernisation activities. As this waste is not chemically active, these waste materials do not influence the chemical properties of the soil; but if the C&D waste is stored on the bare soil it can influence the physical properties of the soil.

2.2 Potential impact on landscape and aesthetics

Improper waste management could cause odour and vermin problem, flow obstruction of nearby watercourse and could negatively impact the landscape.

2.3 Potential impact on occupational and community health

Improper handling of biomedical waste generated from bovine mastitis control program & EVM can have a negative impact on the occupational health as well as the community health.

3. MANAGEMENT PLAN

The POIs, Dairy plant and the dairy outlets should implement the mitigation and control measures which are identified and assessed has potential to cause negative impact on environment and occupational and community health. The following mitigation and control measures shall be implemented:

:

Table 2-1: Identified Waste Management Hazards

| Sl. No. | Sub-component reference and proposed activity | Stages | Types of waste | Control / Mitigation measures |
|---------|---|--------------------|---|---|
| 1. | B.1.2 - Strengthening village level milk chilling infrastructures | Construction Stage | Construction and demolition waste | <ul style="list-style-type: none"> ■ On completion of work all temporary structures, surplus materials and wastes shall be completely removed from site ■ Recyclable materials will be sold to authorised vendor; ■ Construction and demolition waste (inert materials) shall be utilised for filling of site, stored in designated area and finally disposed through third party vendor in municipal dumping ground/ PCB designated area. |
| | | Operational stage | <i>Housekeeping waste:</i> Activities at BMC will not generate any specific kind of waste. The waste will include sweeping waste, stationary waste etc. | <ul style="list-style-type: none"> ■ General household solid waste shall be managed through the municipality/ panchayat level waste management program. If no waste management program available at the location, BMC operator shall build a pit and start dumping the waste in it. The pit shall be closed by soil when filled. |
| 2. | B.1.5 - Community Milking Centres | Construction Stage | Construction and demolition waste | <ul style="list-style-type: none"> ■ Refer to B.1.2 |
| | | Operational stage | <p><i>Waste animal feed:</i> Animal feed left daily by the cattle is one of the waste components.</p> <p><i>Cow dung and urine:</i> Cow/ buffalo dung and urine is another waste generated. It may cause odour due to decomposing if not managed in timely.</p> | <ul style="list-style-type: none"> ■ These are organic and decomposable waste and shall be used in gobar-gas plant. If no gobar-gas plant available, the waste can be used for composting to prepare manure. |

| Sl. No. | Sub-component reference and proposed activity | Stages | Types of waste | Control / Mitigation measures |
|---------|---|--------------------|---|---|
| 3. | B.1.8 - Village level Milk Pasteurization and Product Manufacturing | Construction Stage | Construction and demolition waste | <ul style="list-style-type: none"> Refer to B.1.2 |
| | | Operational stage | <p><u>Packaging waste including plastics:</u> Plastic, paper, aluminium foil, and other packaging waste.</p> | <ul style="list-style-type: none"> The unit shall have contract with third party waste recycler for the management of high volume of packaging waste generated from the plant. |
| 4. | B.2.2 - Installation of milk and milk products booths/ parlours/ kiosks | Construction Stage | Construction and demolition waste | <ul style="list-style-type: none"> Refer to B.1.2 |
| | | Operational stage | <p><u>Packaging waste including plastics:</u> Plastic, paper, aluminium foil, and other packaging waste.</p> | <ul style="list-style-type: none"> Refer to B.1.8 |
| 5. | B.3.2 - Dairy Plant Improvement | Construction Stage | Construction and demolition waste | <ul style="list-style-type: none"> Refer to B.1.2 |
| | | Operational stage | <p><u>Packaging waste including plastics:</u> Plastic, paper, aluminium foil, and other packaging waste.</p> | <ul style="list-style-type: none"> Refer to B.1.8 |
| 6. | C.1.2 - Calf Rearing Centre | Construction stage | Construction and demolition waste | <ul style="list-style-type: none"> Refer to B.1.2 |
| | | Operational stage | <p><u>Waste animal feed:</u> Animal feed left daily by the cattle is one of the waste components.</p> <p><u>Cow dung and urine:</u> Cow/ buffalo dung and urine is another waste generated. It may cause odour due to decomposing if not managed in timely.</p> | <ul style="list-style-type: none"> Refer B.1.5 |

| Sl. No. | Sub-component reference and proposed activity | Stages | Types of waste | Control / Mitigation measures |
|---------|--|--------------------|---|--|
| 7. | C.2.1 - Setting up of Fodder Seed Processing Plant | Construction stage | Construction and demolition waste | <ul style="list-style-type: none"> Refer to B.1.2 |
| | | Operational stage | Excess cobs of the fodder seeds | <ul style="list-style-type: none"> It could be sold as a by-product or converted to other higher value by-products. |
| 8. | C.3.1 - Pilot on control of Bovine Mastitis | Construction stage | Construction and demolition waste | <ul style="list-style-type: none"> Refer to B.1.2 |
| | | Operational stage | <u>Bio-Medical waste</u> : Pathogens could spread from the biomedical waste generated from the facility | <ul style="list-style-type: none"> Segregation refers to the basic separation of different categories of waste generated at source and thereby reducing the risks as well as cost of handling and disposal. Ensure that the bio-medical waste not get mixed with any other category of wastes. The facility shall be disposed through the authorised Bio Medical Waste Treatment Facility according to the statutory requirement. Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio – medical waste treatment facility. This will be carried out with prior approval from the prescribed authority and as per the Standards specified in Schedule – III. |

4. IMPLEMENTATION ARRANGEMENTS

4.1 Roles and Responsibilities

The PMU-NDDDB will be responsible for the operationalization and overall implementation of this WMP. PMU-NDDDB will have a dedicated Environment and Social (E&S) Cell, who will act as Nodal Officer for implementation of E&S management system. E&S Cell will seek WMP implementation update on predefined KPIs from POIs of respective states in the monthly, quarterly and annual project implementation update report.

Table 2-2 Roles and Responsibilities for WMP Implementation

| S. No | Entity | Responsibility in SEP implementation |
|-------|--|---|
| 1 | E&S Cell, NDDDB | Nodal agency for implementing E&S action plan including WMP implementation; Updating WMP on regular basis based on feedback received from line agencies like CPSC, PFC, SLTMC, POIs Supervision of WMP implementation by POIs |
| 2 | State Level Technical Management Committee (SLTMC) | Monitor WMP implementation by respective POIs of the state; Provide feedback to NDDDB on WMP related matters, including periodic data on implementation |
| 3 | State Federation | Monitor WMP implementation by respective POIs of the state; Provide feedback to NDDDB on WMP related matters. |
| 4 | Other POIs (Milk Union, Milk Producer Companies, FPO etc.) | Implement actions as proposed in WMP with the guidance from NDDDB; Maintain records of monitoring at their offices. |

4.2 Training on WMP implementation

Sufficient training needs to be provided to all personnel. The scope of the training will ensure that workers are able to fulfil their waste management roles and functions through awareness on relevant aspects of this plan, related legislation and standards and general waste management practices (tidiness, waste segregation, etc.). Training details (e.g. participants, subjects, training hours provided, etc.) will be recorded.

4.3 Monitoring and Reporting

Performance of POIs on WMP implementation will be assessed based on following monitoring and reporting activities.

- Periodical site inspection and visual observation;
- Monthly inspection report to State Federation

ANNEXURE 1: CHECKLIST FOR RECORDKEEPING AND DOCUMENTATION FOR WASTE MANAGEMENT

| Documentation | Record keeping (Yes/ No) | Evidence/ Document reference and date | Remarks |
|---|---|---------------------------------------|---------|
| Different storage facility for different waste | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Regular clearing of waste container | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Adequate number of bins | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Colour coding bins for biomedical waste storage | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Authorised vendor for collection of waste | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Training Log | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |

ANNEXURE 2: WASTE MONITORING CHECKLIST

Waste monitoring checklist

| Management of municipal and recyclable waste generated from Project activities | | | | |
|---|--|---|---|--|
| Type of waste | <input type="checkbox"/> Municipal/ <input type="checkbox"/> Recyclable <input type="checkbox"/> Bio-medical | <input type="checkbox"/> Municipal/ <input checked="" type="checkbox"/> Recyclable <input type="checkbox"/> Bio-medical | <input type="checkbox"/> Municipal <input type="checkbox"/> Recyclable <input type="checkbox"/> Bio-medical | <input type="checkbox"/> Municipal/ <input checked="" type="checkbox"/> Recyclable <input type="checkbox"/> Bio-medical |
| Monthly quantity of generation, m ³ | | | | |
| Location of storage | | | | |
| Disposed through | Name of the agency | Name of the agency | Name of the agency | Name of the agency |
| Management of construction and demolition waste generated from Project activities | | | | |
| Monthly quantity of generation, m ³ | | | | |
| Location of storage | | | | |
| Disposed through | Name of the agency | Name of the agency | Name of the agency | Name of the agency |

APPENDIX H: GENDER AND SOCIAL INCLUSION ACTION PLAN (GSIA)

1. INTRODUCTION

1.1 NDSP Phase-II Project Background

NDDB has proposed the National Dairy Support Project Phase II Project (herein after also referred as 'Project') for World Bank support with the broad objective *'To enhance competitiveness, foster inclusion, improve resilience and reduce the carbon footprint of milk value chains, focusing on small farmers in project areas'*. The Project will focus on less dairy developed States, which have been identified based on the supply infrastructure of Producer Owned Institutions (POIs) (functional Dairy Cooperative Societies (DCSs)/ Milk Pooling Points (MPPs) coverage, milk procurement share and processing capacity) and liquid milk marketing coverage. Further, due representation has been given to the hilly & North-Eastern States. Accordingly, 6 States have been identified for the project, viz. Jharkhand, Odisha, Madhya Pradesh, Himachal Pradesh, Uttarakhand, and Sikkim. The pilot activities envisaged in the project may be located within or outside the identified Indian states.

1.2 Gender and Social Inclusion Context

The execution of NDSP-II will include encouraging women/ youth participation in dairy through Entrepreneurship development Programme, and trainings and capacity building programs under Component A. Under Component B: Strengthening Dairy Market Development, there will be activities linked to expansion of village coverage, setting up of CMCs, deployment of human resources, and coursing of labour, coupled with creation or strengthening of livelihoods. In the Impact Assessment under the ESMF, potential impacts (both negative and positive) have been assessed on women and vulnerable groups. In this context, particular emphasis is on possibility of exclusionary and discriminatory practices against vulnerable groups such as women, scheduled castes, scheduled tribes, persons with disability, etc. in execution of NDSP-II. This document has been prepared to identify the overall framework of Gender and Social Inclusion in the project, preparing a prevention and response action to ensure that such cases are at first prevented, and if such cases do occur, there is a mitigation action identified to address them, along with a grievance mechanism for the complainant as well as the project implementing agency to best manage such risks.

World Bank's ESF's Environmental and Social Standards (ESSs) set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the World Bank. While the ESF itself does not explicitly mention Gender and Social Inclusion, various ESSs are referred for addressing the issue, including:

- ESS1: Assessment and Management of Environmental and Social Risks and Impacts;
- ESS 7: Indigenous Peoples
- ESS10: Stakeholder Engagement and Information Disclosure

2. GENDER AND SOCIAL INCLUSION- OVERVIEW

Over the years the dairy cooperatives have emerged as a vehicle for inclusive development and playing an important role in empowering women. As evidenced by the Equity and Inclusion Study¹⁴, women's involvement in NDSP-I showed significant evolution with potential to be leveraged in new operations. Women as service providers significantly affected their standing in the village and contributed to their empowerment and income.

¹⁴ Contribution of the National Dairy Plan I to the Inclusion, Equity and Income of Dairy Farmers, IEG, 2019

The execution of NDSP-II is envisioned to further encouraging women/ youth participation in dairy through Entrepreneurship development Programme, and trainings and capacity building programs under Component A. Under Component B: Strengthening Dairy Market Development, there will be activities linked to expansion of village coverage, setting up of CMCs, deployment of human resources, and coursing of labour, coupled with creation or strengthening of livelihoods.

NDSP-II has been conceptualised as having women both as beneficiaries, as well as resources/workers and hence there lies the possibility of Gender Based Violence (GBV) including Sexual Exploitation Abuse/Sexual Harassment (SEA/SH) in execution of NDSP-II. For addressing this, a Gender Based Violence Action Plan (Annexure to Gender and Social Inclusion Plan) has been prepared to ensure that such cases are at first prevented, and if such cases do occur, there is a response mechanism for the survivor as well as the project implementing agency to best manage such risks. The GBV Action Plan, details the necessary operational measures and protocols that will be put in place to address all forms of Gender Based Violence including SEA/SH related to the project and how they will be integrated over the life of the project. These include how to address any allegations that may arise and procedures for preventing and responding to GBV. The Plan also details how cases on GVB & SEA/SH will be handled (investigation procedures).

With regard to the social inclusion, the World Bank's work on Social Sustainability and Inclusion focuses on:

- **Creating opportunities for all people and addressing deep rooted systemic inequalities:** Persistent discrimination and exclusion of the most marginalized come at a high cost to both people and the economy. Globally, the loss in human capital wealth due to gender inequality is estimated at \$160.2 trillion. 90 percent of children with disabilities in developing countries do not attend school. In many countries, it is especially difficult to tackle LGBTI exclusion, discrimination, and violence. To date, 70 countries continue to criminalize homosexuality. Social Sustainability and Inclusion focuses on increasing opportunities for all marginalized people to participate fully in markets, services, technologies, and society.
- **Empowering people to be drivers of their own solutions:** Building on participatory approaches and a community's own values, Community-Driven Development (CDD) programs improve community services and basic infrastructure to help residents, especially the most vulnerable, reach their potential and develop their livelihoods. They also strengthen the capacity of residents and community leaders to articulate their needs and engage with local and regional governments.
- **Creating resilient societies requires working in the most fragile and difficult environments:** For people living in the most challenging environments, it is important to strengthen resilience by creating opportunities to thrive. This is to be done by building strong households and communities that can withstand divisions caused by conflict, violence and exogenous shocks such as climate change or pandemics. That's why focus is on building social cohesion in countries that are tackling conflict and violence.

2.1.1 Existing country diagnostics- India

The World Bank Gender Data Portal report¹⁵ (2021) provides insights on gender quality in India against various indicators. Some key takeaways are provided below:

- 145 women die per 100,000 live births due to pregnancy-related causes in India
- Adult literacy in India is lower among women than among men (2018)

¹⁵ <https://genderdata.worldbank.org/countries/india/>

- In India, the labor force participation rate among females is 19.2% and among males is 70.1% for 2021
- Vulnerable employment for females has improved in India since 1991
- 67% of men and 37.1% of women owned a dwelling either alone or jointly in 2016
- 63% of women participated in making major decisions in the household in 2016
- In India, the share of women who have experienced intimate partner violence is nearly the same as the world average, 27%
- Women represented 16.4% of those employed in senior and middle management in 2019

At the international level, India has ratified the UN Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). India signed CEDAW on July 30, 1980 and ratified it on July 9, 1993, with certain reservations. India has not yet ratified the Optional Protocol to CEDAW.¹⁶

At the national level, India has enacted a law for addressing sexual harassment at workplace, as well as promoting gender parity in school enrolment and setting quotas for women's representation in local self-governance.

According to the Census 2011, vulnerable groups (Scheduled Castes (SC), Scheduled Tribes (ST) and Other Backward Classes (OBC)) together constituted about 70 percent of India's total population. Over the decades, India has witnessed a major reduction in multi-dimensional poverty. According to the Global Multidimensional Poverty Index (MPI) 2021 (Unmasking disparities by ethnicity, caste and gender) released by the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative (OPHI), five out of six multidimensionally poor people in India are from lower tribes or castes. The Scheduled Tribe group accounts for 9.4 percent of the population and is the poorest, with 65 million of the 129 million people living in multidimensional poverty.¹⁷

SCs, STs, OBCs, Safai Karamcharis, De-notified Tribes (DNTs), and Semi-notified Tribes (SNTs) belong to the poorest economic strata of Indian society and face severe economic and social exclusion, segregation in housing, denial, and restrictions of access to public and private services and employment. They tend to constitute a substantial proportion of casual labour in the country. In a breakdown analysis of caste data in public and private sector, it was found that discrimination accounts for 19.4 percent and 31.7 percent lower wages for SC in the public and private sectors respectively when compared to the higher castes. In addition, some tribal groups have some specific features such as dependency on hunting, gathering for food, having pre-agriculture level of technology, zero or negative growth of population and extremely low level of literacy. These groups are called Particularly Vulnerable Tribal Groups or PVTGs. India has total of 75 PVTGs out of 705 Scheduled Tribes, spread over 17 states and one Union Territory (UT).¹⁸

This shows that unequal labour market outcomes are caused due to systemic inequalities in a caste-based society. Backward classes such as SCs face extreme exclusion from society in terms of access to education, healthcare, government services, markets, employment and use of land and water resources. Although major progress has been made in reducing multidimensional poverty in India, acute deprivation is prevalent in nutrition, health, school education and sanitation for 364 million Indians. More than half of all

¹⁶ <https://gnwp.org/wp-content/uploads/India-Case-Study-.pdf>

¹⁷ https://dmeo.gov.in/sites/default/files/2022-10/Thematic-report_Social-Inclusion_14102022-%20Final.pdf – Last Accessed on 27 February 2023

¹⁸ <https://vikaspedia.in/social-welfare/scheduled-tribes-welfare/particularly-vulnerable-tribal-groups>

multidimensionally poor individuals in India live in the four poorest states – Bihar, Jharkhand, Madhya Pradesh and Uttar Pradesh. These constitute 196 million multidimensionally poor people.¹⁹

Social exclusion permeates Indian society far beyond caste discrimination (SC, ST, OBC and DNTs/S DNTs) and also includes vulnerable groups who face discrimination based on their religion (religious minorities), age (senior citizens, street children), economic status and occupation (economically weaker sections, homeless, manual scavengers), physical and mental ability (people with disabilities, mentally ill, victims of alcohol and substance abuse) and their gender identity (transgender people). The table below provides

2.1.2 Legal Safeguards and Institutions

The Constitution of India and the India legal system has following safeguards for social inclusion and gender mainstreaming:

- Constitution of India - Article 17, 46, 335, 15(4), 16(4A), 338, 330 and 332, 342, 366 (25)
- Protection of Civil Rights Act 1955
- The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities Act) 1989
- Panchayat Raj Extension to Scheduled Areas (PESA) Act, 1996
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act also known as Forest Rights Act, 2006
- The Immoral Traffic (Prevention) Act, 1956
- The Dowry Prohibition Act, 1961 (28 of 1961) (Amended in 1986)
- The Commission of Sati (Prevention) Act, 1987 (3 of 1988)
- Protection of Women from Domestic Violence Act, 2005
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013
- The Criminal Law (Amendment) Act, 2013
- The Indecent Representation of Women (Prohibition) Act, 1986

Although such laws provide part of the essential legal framework for protecting and promoting women's equal rights in the public sphere, traditional norms and customs ensure that women continue to face considerable injustices in the home and in the community which undermines their rights to equality.

The National Commission for Women was set up as statutory body in January 1992 under the National Commission for Women Act, 1990 (Act No. 20 of 1990 of Govt.of India) to :

- review the Constitutional and Legal safeguards for women ;
- recommend remedial legislative measures ;
- facilitate redressal of grievances and

advise the Government on all policy matters affecting women.herefore, India has also enacted several laws at the national level to protect equality of rights and opportunities although a detailed review of their implementation and impact has not yet been undertaken. The Constitution of India grants equal rights to

¹⁹ UNDP (2019) 2019 Global Multidimensional Poverty Index (MPI)

women and men in all spheres of public life and has been supplemented by several laws²⁰ to safeguard women's equal rights. There are also several government bodies and institutions that oversee implementation these safeguards. There are dedicated ministries and departments and at central and state levels on women and child development, minorities, SC, ST development and likewise. The legal framework and institutional arrangement is supported by a very wide and strong civil society network on gender and social inclusion in India.

2.2 Potential Scenarios -Risks and Impacts

The project will involve construction activities under Component B and Component C which will involve construction activities for milk collection centres, CMC, BMC, and further strengthening of value chain/cold chain which will require site preparation, transportation of construction material, mobilization of labour force etc. The impacts linked with gender and social inclusion issues which are expected during construction phase include, employment generation (positive) for women workers and workers from SC/ST communities and also create indirect employment for many others. The construction phase will also create impacts for safety, mobility and access to public spaces and transport, resulting in impacts on women and social excluded classes such as SC/ST, minorities, persons with disabilities, sexual minorities+ etc.

Some of the social exclusion risks for the project are:

- Exclusion of scheduled caste, scheduled tribe (SC/ST) and women dairy farmers from taking up membership and leadership positions among POIs
- Exclusion from accessing extension and milk procurement services,
- Exclusion of small, remote habitations not coming within the milk procurement milk routes owing to their physical isolation.
- If infrastructure is not disability-friendly, farmers/ DCS members with disability will not be able to access them.
- Experiences of discriminations faced by SC/STs and other vulnerable groups can also lead low engagement levels.
- Socially excluded groups may not have the information and support structures in place to report instances of discrimination and crimes of sexual harassment and assault that can occur
- Workers and employees at project facilities may not be supportive of complaints against discrimination and sexual harassment received from community unless adequately sensitised, trained, and required to respond adequately. Instances of social exclusion and discrimination can also occur among project staff and not necessarily with community.

3. GENDER AND SOCIAL INCLUSION ACTION PLAN

The GSI Action Plan has been divided into three phases: Design, Construction and Operations and Maintenance. Capacity building measures will be covered in both construction and operations stage. Table below summarizes the following:

- Objectives
- Impacts
- Activities and targets in conjunction with the key findings and impacts
- Responsibility for meeting these targets and the means of verification for the same.

²⁰ <http://ncw.nic.in/important-links/List-of-Laws-Related-to-Women>

Table 1-1 Gender and Social Inclusion Action Plan

| Output and Gender Related Objective | Issues/ Impact | Activities and Targets | Responsibility | Means of Verification |
|--|---|--|--------------------|---|
| <p>Phase 1: Planning & Design</p> | <ul style="list-style-type: none"> ■ Need for context specific in-depth understanding of needs and priorities of women and socially excluded groups about project activities, coverage of dairy development activities, and capacity building aspects. ■ Need for context specific in-depth understanding of challenges faced by disabled persons and disability-friendly in accessing facilities, and public amenities ■ Intent of NDDB and mandate from World Bank to incorporate gender- and social inclusion measures in the project | <ul style="list-style-type: none"> ■ A Social expert shall be deployed under the project and ; ■ Use of National Building Code to ensure universal accessibility features in all aspects for persons with temporary, permanent, hidden disabilities. These also will include following the norms for minimum space requirement for wheel-chair users, avoiding obstacles, projections or protrusions, tactile markings, and surface quality of flooring and paving. ■ Provisions of display of information on how to access benefits under the project and other convergent Govt schemes ■ Developing communication plans for Radio Samvad on topics of Gender and Social Inclusion, SEA/SH etc. ■ Sensitization and awareness on GSI and GBV in training programs designed under NDSP II | <p>PMU and POI</p> | <ul style="list-style-type: none"> ■ Appointment of Social Safeguards Expert ■ Design and operational and management plan including Gender and social inclusion friendly measures ■ Meeting reports incorporating recommendations from the Advisory Board GSIAP ■ Training of Contractor and team on gender and social inclusion friendly measures to be incorporated ■ Based on the above, create checklist for verification, at later audits. ■ Radio Samvad content review |
| <p>Phase 2: Construction/ Capacity Building</p> | <ul style="list-style-type: none"> ■ Restrictions placed on women's mobility employment in traditionally 'male-dominated' work; ■ Discrimination and wage inequality faced by women in construction | <ul style="list-style-type: none"> ■ Appoint senior focal points in both clients and contractors with responsibility for ensuring that commitments and policies for safeguarding the rights of women workers in construction camps. ■ Code of Conduct of the construction workers, contractors, and staffs from POI. All parties will be made aware of the COC | <p>PMU and POI</p> | <ul style="list-style-type: none"> ■ Review of workforce records ■ Recruitment Policy ■ Non-Discrimination and Anti-Sexual Harassment Policy ■ Physical Inspection of labour camps ■ Grievance Records |

| Output and Gender Related Objective | Issues/ Impact | Activities and Targets | Responsibility | Means of Verification |
|-------------------------------------|--|---|----------------|---|
| | <p>work as against men, and migrant workers against local workers</p> <ul style="list-style-type: none"> ■ Risks and threats to personal safety and wellbeing; ■ Challenges faced by local community during the construction phase owing increased traffic movement, labour influx; ■ Creation of 'unsafe zones' around construction sites; ■ Discrimination based on caste/ tribe/ sexual orientation/ region/ gender etc. among construction workers | <p>and these will be understood and signed, monitored</p> <ul style="list-style-type: none"> ■ Recruitment policy should include measures to hire women and persons with disability, and persons belonging to SC/ST and other vulnerable communities and measures to encourage recruitment, retention and promotion of the same. Consultations with livelihoods NGOs, labour supply agencies and contractors, and unions can be undertaken to map out skills, provision of favourable working conditions as well as mobilization processes; ■ Separate sanitary and toilet facilities for men and women, and persons with disability ■ Separate sleeping areas provided for men and women (if accommodation is provided) ■ Provisions for pregnant women, if any, such as easy access to rooms/dormitories, rest provisions during work etc. ■ Provisions for child creches at labour camps/ offices for women and families with children. ■ Provision of safe transport that is organized by the contractors for women workers from camp to the construction site, or training and capacity programs ■ Training and sensitization of staff and management on social inclusion, sexual harassment, abuse, discrimination etc.; | | <ul style="list-style-type: none"> ■ Training Calendar, Module and Attendance Records ■ Physical inspection of traffic management plan, especially to confirm measures for barrier-free, well-lit pedestrian movement areas |

| Output and Gender Related Objective | Issues/ Impact | Activities and Targets | Responsibility | Means of Verification |
|-------------------------------------|---|--|----------------|---|
| | | <ul style="list-style-type: none"> ■ Consider engaging expertise (e.g. from local women's rights organisations or NGOs working on women's rights, sexual harassment at the workplace and gender based violence) to conduct awareness campaigns to provide information to local communities, such as what is unacceptable behaviour, HIV awareness, sexual harassment, other sexual and reproductive health issues etc. ■ Develop confidential grievance reporting, referral and support systems for workers. ■ ■ Establish safe, confidential and accessible grievance mechanisms for local communities. ■ Include options to report anonymously if preferred. ■ Consider engaging expertise to conduct mappings of formal services (healthcare, counselling) and informal resources (including through women's organisations) to support women who have faced harassment or violence. ■ Monitoring visits during construction phase and implementation of capacity building programs by advisory group and other relevant stakeholders | | |
| | <ul style="list-style-type: none"> ■ Infrastructure may not be disability-friendly and impact accessibility; | <ul style="list-style-type: none"> ■ Designated sections/queues for women dairy farmers, especially pregnant women, | NDDDB and POI | <ul style="list-style-type: none"> ■ Physical Verification of the below: |

| Output and Gender Related Objective | Issues/ Impact | Activities and Targets | Responsibility | Means of Verification |
|---|--|---|----------------|---|
| <p>Phase 3: Implementation and Execution</p> | <ul style="list-style-type: none"> ■ Reservation policy may not be implemented well, ■ Accessibility to training programs by women, and vulnerable groups may be hampered ■ Experiences of sexual harassment in POIs ■ Poor grievance redressal mechanisms; ■ Project teams/staff complaints against sexual harassment received from women; | <p>women with children as well as persons with disability;</p> <ul style="list-style-type: none"> ■ Feasibility assessment of women-only staff ■ Reserved Seating for pregnant women, ■ Promoting CCTV surveillance in facilities to monitor harassment and violence (and other crimes and illegal acts); ■ A strong complaint and redress system that is displayed at all relevant locations ■ Mandatory training and awareness sessions on gender sensitivity and non-discrimination for staff ■ Radio Samvad- information dissemination on social inclusion, SEA/SH, GRM, helpline numbers etc. ■ Elevators planned where needed; ■ Surprise/unannounced inspection visits to assess the behaviour project staff towards women and persons with disabilities and SC/STs; ■ Display of helpline numbers and display of general principles on good behaviour with women and girls, elderly, person with disabilities on screens/ posters/ signage; ■ Compliance with applicable laws on gender and social inclusion safeguards ■ Encourage increased employment and outreach to women farmers and livestock owners, dairy operators ■ Sensitization o all employees on gender attitudes towards women , prevention of sexual harassment etc. | | <ul style="list-style-type: none"> - Gender and Social Inclusion Implementation Audit Report - CCTV records - Training Calendar, Module and Attendance Records - Grievance Records - Review of Workforce records - Equal pay for equal work policy - Prevention of Sexual Harassment at Workplace Policy ■ Prepare monitoring calendar based on frequency and monitoring indicators that will be agreed, based on the measures implemented during the design stage, and process indicators, based on agreement on processes incorporated with sup project plans. ■ Based on the above, conduct regular monitoring and reporting on the agreed indicators. (these have not been listed as they will emerge only after the design and O&M measures w.r.t gender and social inclusion have been incorporated. |

| Output and Gender Related Objective | Issues/ Impact | Activities and Targets | Responsibility | Means of Verification |
|-------------------------------------|----------------|--|----------------|-----------------------|
| | | <ul style="list-style-type: none"> ■ Promoting well-functioning and maintained utilities and lighting facilities along with CCTV cameras facilities ■ Community engagement (as outlined in SEP) and raising awareness on issues on discrimination, sexual violence, harassment, gender and community sensitive language and attitude. ■ Equal pay for equal work policy; ■ No tolerance toward sexual harassment and appropriate grievance redressal mechanisms; ■ Undertake frequent (quarterly/half-yearly) Gender and Social Inclusion Action Plan Implementation Audits which should cover the aforementioned aspects | | |

Annexure to GSIA: Gender Based Violence Action Plan

Glossary and Definitions ²¹

| Term | Definition |
|--|---|
| Child marriage | Child marriage refers to any formal marriage or informal union between a child under the age of 18 and an adult or another child (UNICEF). |
| Gender-based violence (GBV) | Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially-ascribed (i.e., gender) differences between males and females. It includes acts that inflict physical, sexual or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private (2015 Inter-Agency Standing Committee Gender-based Violence Guidelines, pg. 5). |
| Gender-based violence (GBV) service provider | An organization offering specific services for GBV survivors, such as health services, psychosocial support, shelter, legal aid, safety/security services, etc. |
| Human trafficking | Trafficking in persons is defined as the recruitment, transportation, transfer, harboring or receipt of persons by means of the threat or use of force or other forms of coercion, abduction, fraud, deception, abuse of power, or of a position of vulnerability, or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purposes of exploitation. Women and children are particularly vulnerable to trafficking practices (Environmental and Social Standard (ESS) 2, footnote 15). |
| SEA/SH Prevention and Response Action Plan | Document which outlines how the project will put in place the necessary protocols and mechanisms to address SEA/SH risks; and how to address any SEA/SH allegations that may arise. This is the new name for the GBV Action Plan, as used in the original (2018) version of this note. The SEA/SH Prevention and Response Action Plan should include an Accountability and Response Framework, which details how allegations of SEA/SH will be handled (investigation procedures) and disciplinary action for violation of the Code of Conduct (CoC) by workers. |
| Sexual exploitation and abuse (SEA) | Sexual exploitation: any actual or attempted abuse of a position of vulnerability, differential power or trust for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another (UN Glossary on Sexual Exploitation and Abuse 2017, pg. 6). Sexual abuse: actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions (UN Glossary on Sexual Exploitation and Abuse 2017, pg. 5). |
| Sexual harassment (SH) | Any unwelcome sexual advances, request for sexual favors, and other verbal or physical conduct of a sexual nature. |
| Survivor-centered approach | The survivor-centered approach is based on a set of principles and skills designed to guide professionals—regardless of their role—in their engagement with survivors (predominantly women and girls but also men and boys) who have experienced sexual or other forms of violence. The survivor-centered approach aims to create a supportive environment in which the survivor's interests are respected and prioritized, and in which the survivor is treated with dignity and respect. The approach helps to promote the survivor's recovery and ability to identify and express needs and wishes, as well as to reinforce the survivor's capacity to make decisions about possible interventions. |
| Violence against women (VAW) | Article 1 of the 1993 UN Declaration on the Elimination of Violence against Women defines violence against women as any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life. Article 2 of the Convention further states that violence against women shall be understood to encompass, but not be limited to, the following: (a) physical, sexual and psychological violence occurring in the family, including battering, sexual abuse of female children in the household, dowry-related violence, marital rape, female genital mutilation and other traditional practices harmful to women, non-spousal violence and violence related to exploitation; (b) physical, sexual and psychological violence occurring within the general community, including rape, sexual abuse, sexual harassment and intimidation at work, in educational institutions and elsewhere, trafficking in women and forced sex work; (c) physical, sexual and psychological violence perpetrated or condoned by the State, wherever it occurs. The term violence against women and girls is also used. |

²¹ Good Practice Note: Environmental & Social Framework for IPF Operations

1. INTRODUCTION

1.1 NDSP Phase-II Project Background

NDDB has proposed the National Dairy Support Project Phase II Project (herein after also referred as 'Project') for World Bank support with the broad objective *'To enhance competitiveness, foster inclusion, improve resilience and reduce the carbon footprint of milk value chains, focusing on small farmers in project areas'*. The Project will focus on less dairy developed States, which have been identified based on the supply infrastructure of Producer Owned Institutions (POIs) (functional Dairy Cooperative Societies (DCSs)/ Milk Pooling Points (MPPs) coverage, milk procurement share and processing capacity) and liquid milk marketing coverage. Further, due representation has been given to the hilly & North-Eastern States. Accordingly, 6 States have been identified for the project, viz. Jharkhand, Odisha, Madhya Pradesh, Himachal Pradesh, Uttarakhand, and Sikkim. The pilot activities envisaged in the project may be located within or outside the identified Indian states. The programme is proposed to be implemented for a period of 5 years extendable to 7 years.

1.2 Gender Based Violence Context

The execution of NDSP-II will include encouraging women/ youth participation in dairy through Entrepreneurship development Programme, and trainings and capacity building programs under Component A. Under Component B: Strengthening Dairy Market Development, there will be activities linked to expansion of village coverage, setting up of CMCs, deployment of human resources, and coursing of labour, coupled with creation or strengthening of livelihoods. In the Impact Assessment under the ESMF, potential impacts (both negative and positive) have been assessed on women. In this context, particular emphasis is on possibility of Gender based violence including sexual exploitation abuse/sexual harassment in execution of NDSP-II. This document has been prepared to identify the overall framework of GVB including SEA/SH in India, preparing a prevention and response action to ensure that such cases are at first prevented, and if such cases do occur, there is a response mechanism for the survivor as well as the project implementing agency to best manage such risks.

This GBV Action Plan, details the necessary operational measures and protocols that will be put in place to address all forms of Gender Based Violence including SEA/SH related to the project and how they will be integrated over the life of the project. These include how to address any allegations that may arise and procedures for preventing and responding to GBV. The Plan also details how cases on GVB & SEA/SH will be handled (investigation procedures).

World Bank's ESF's Environmental and Social Standards (ESSs) set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the World Bank. While the ESF itself does not explicitly mention SEA/SH, various ESSs are referred for addressing SEA/SH and GBV including:

- ESS1: Assessment and Management of Environmental and Social Risks and Impacts;
- ESS2: Labor and Working Conditions;
- ESS4: Community Health and Safety; and
- ESS10: Stakeholder Engagement and Information Disclosure

The key principles²² that guide this plan are:

1. Be survivor-centered: Approach considerations related to GBV prevention, mitigation and response through a survivor-centered lens, protecting the confidentiality of survivors; recognizing them as principal decision-makers in their own care; and treating them with agency, dignity and respect for their needs and wishes.
2. Emphasize prevention: Adopt risk-based approaches that aim to identify key risks of GBV and to undertake measures to prevent or minimize harm.
3. Build on existing local knowledge: Engage community partners—local leaders, civil society organizations, gender and child advocates—as resources for knowledge on local-level risks, effective protective factors and mechanisms for support throughout the project cycle.
4. Be evidenced-based: Build on existing global research and knowledge on how to address GBV effectively.
5. Be adaptable: Adapt and adjust prevention and mitigation measures to respond to the unique drivers and context in any given setting.
6. Minimize harm to women and girls: The project staff must be trained on how to preserve the safety of women while interviewing/collecting data on this topic. Women may suffer physical harm and other forms of violence if partners/perpetrators discover that they have been talking to others about their personal relationships. Because many violent partners/perpetrators control the actions of women with whom they are in a relationship, even the act of speaking to another person without their permission may trigger a woman's beating. As such, asking women about violence should be confidential, and should take place in complete privacy, with the exception of children under the age of two. Consent for any data collection, even as part of a case file, should be offered and if anonymity can be guaranteed, it should also be provided.
7. Enable continuous monitoring and learning: Ensure operations integrate mechanisms for regular monitoring and feedback to track effectiveness and to build internal knowledge of what works to prevent, mitigate and respond to GBV.

2. GENDER BASED VIOLENCE- CONTEXT

2.1 Overall GBV Risks in India

World Bank uses the following definition to explain Gender Based Violence (GBV)²³

Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially-ascribed (i.e., gender) differences between males and females. It includes acts that inflict physical, sexual or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private (2015 Inter-Agency Standing Committee Gender-based Violence Guidelines, pg. 5)

Further, Sexual Exploitation and Abuse (SEA) is defined as²⁴:

²² <https://thedocs.worldbank.org/en/doc/632511583165318586-0290022020/original/ESFGPNSEASHinmajorcivilworks.pdf>

²³ World Bank (2018). Good Practice Note on Addressing Gender Based Violence in Investment Project Financing involving Major Civil Works. Retrieved from <https://thedocs.worldbank.org/en/doc/632511583165318586-0290022020/original/ESFGPNSEASHinmajorcivilworks.pdf>

²⁴ Ibid.

Sexual exploitation: any actual or attempted abuse of a position of vulnerability, differential power or trust for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another (UN Glossary on Sexual Exploitation and Abuse 2017, pg. 6).

Sexual abuse: actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions (UN Glossary on Sexual Exploitation and Abuse 2017, pg. 5).

Sexual Harassment (SH) is defined as: *Any unwelcome sexual advances, request for sexual favors, and other verbal or physical conduct of a sexual nature. SH differs from SEA in that it occurs between personnel/staff working on the project, and not between staff and project beneficiaries or communities. The distinction between SEA and SH is important so that agency policies and staff training can include specific instructions on the procedures to report each. Both women and men can experience SH.*

With regard to the NDSP-II, it is anticipated that there will be significant engagement and with and involvement of women in activities listed out in Component A, B, C and D. Therefore, NDSP-II has been conceptualised as having women both as beneficiaries, as well as resources/workers. For example, women will be beneficiaries of project activities linked to enhancement of livelihood through initiatives specially under Component B, but also be involved in capacity building programs both as resources/workers imparting these trainings, but also as recipients of the same. Construction activities too will lead to local labour mobilisation or migrant labour influx, bringing along with it the potential risk of increase in GBV (and SEA), specifically against women and girls.

At the international level, India has ratified the UN Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). India signed CEDAW on July 30, 1980 and ratified it on July 9, 1993, with certain reservations. India has not yet ratified the Optional Protocol to CEDAW.²⁵

At the national level, India has enacted a law for addressing sexual harassment at workplace, as well as promoting gender parity in school enrolment and setting quotas for women's representation in local self-governance.

The country has also enacted several laws at the national level to protect equality of rights and opportunities. The Constitution of India grants equal rights to women and men in all spheres of public life and has been supplemented by several laws²⁶ to safeguard women's equal rights, most relevant in the context of NDSP II are:

- Protection of Women from Domestic Violence Act, 2005
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013

Although such laws provide part of the essential legal framework for protecting and promoting women's equal rights in the public sphere, women continue to face considerable injustices in the home and in the community owing to traditional norms and customs which undermines their rights to equality.

The National Commission for Women was set up as statutory body in January 1992 under the National Commission for Women Act, 1990 (Act No. 20 of 1990 of Govt.of India) to :

- review the Constitutional and Legal safeguards for women ;
- recommend remedial legislative measures ;

²⁵ <https://gnwp.org/wp-content/uploads/India-Case-Study-.pdf>

²⁶ <http://ncw.nic.in/important-links/List-of-Laws-Related-to-Women>

- facilitate redressal of grievances and
- advise the Government on all policy matters affecting women.

2.2 Potential Scenarios to identify risks and impacts

This sub-section discusses the potential risk and impacts related to GVB including SEA&SH. The project has been screened for such risks using the standard World Bank Tool as shown in the table below²⁷. The main significant risks identified include abuse of trust, power and the exchange of favours by staff, consultants, or workers of milk collection centres, CMCs, and other facilities or companies associated with or resulting from the project. This risk is likely to occur at the interface between the project with the community, community with the contractors, community with companies and so on. Therefore, the SEA/SH risks are rating are presented in **Table 2.1**.

Table 1-1 GBV Risk Screening Matrix

| Project Context | Response | Risk Rating | Comment |
|---|----------|---------------|--|
| Is project in an area with active emergency or humanitarian situation? | No | Moderate Risk | Parts of states of Jharkhand, Odisha and Madhya Pradesh are affected by Left Wing Extremism ²⁸ . However, there are no verified assessments of LWE areas having high incidence of GBV. |
| How much infrastructure construction, upgrading or rehabilitation does the project entail? | Small | Moderate Risk | The Project will have modest levels of construction of infrastructure such as Milk collection centres at village level, CMC, processing plants etc. |
| What is the extent of the influx of labour associated with project activities? | Low | Moderate Risk | The project will require the recruitment of non-local staff for the implementation of activities, technical assistance, and capacity building activities. Because of the small-scale civil works, activities will lead to some labour influx. Additionally, during operation phase resultant value addition activities could lead to the arrival of new workers. |
| During the preparation of the project, were consultations carried out with residents, women's associations, and children? | Yes | Low Risk | Consultations and sample household surveys were conducted in four states for the preparation of ESMF and associated management plans. Women respondents, customers, retailers, milk unions etc. were covered in the engagement activities. |

²⁷ Note that the responses are through data collected from consultations and public domain. As per the toolkit guidance, through 25 questions, 12 to be answered by the Task Team and 13 that are prepopulated, the tool gives each project a risk "score" based on the responses to the questions. The questions are meant only as a starting point and are not intended to be exhaustive. As multiple forms of GBV have the same risk factors and drivers, the tool can be used to understand the overall context and how the project may interact with this context in relation to multiple forms of GBV, not just SEA/SH
<https://thedocs.worldbank.org/en/doc/632511583165318586-0290022020/original/ESFGPNSEASHinmajorcivilworks.pdf>

²⁸ <https://www.mha.gov.in/en/divisionofmha/left-wing-extremism-division#:~:text=of%20India%20in%20LWE%20affected,affected%2C%20although%20in%20varying%20degrees.>

| | | | |
|---|-----------------------------|------------------|--|
| During the consultations, were aspects of SEA/SH raised by the participating women? | No | Moderate Risk | No specific SEA/SH issues were raised, except it was suggested that SEA/SH cases in the project be handled with confidentiality. |
| Does the project area include areas of high poverty? | Yes | High Risk | Some of the project locations have low scores in HDI. As per India's national multi-dimensional poverty index 2021, 42% in Jharkhand, 36% in Madhya Pradesh, 29% in Odisha, 17% in Uttarakhand, 7% in Himachal Pradesh and 3.8% in Sikkim is the percentage of population who are multidimensionally poor in each State/UT ²⁹ . India overall ranks 66 in the global multi-dimensional poverty index. |
| Is the project located in regions that are difficult to supervise (remote or difficult to access areas)? | No | Substantial Risk | The project is located in six states of India with some areas located in the remote areas in hilly/mountainous terrain. Therefore, the project will face challenges linked to accessibility. |
| Is the project located in an urban, peri-urban, or rural area? | Rural, peri-urban and Urban | High Risk | The project is predominantly located in rural areas, but a few activities will be done in urban and peri-urban areas to cover the dairy value chains. |
| Are project activities on a school route or other routes that women and girls use to carry out their daily activities | Likely | Moderate Risk | The proposed project activities will most likely locate near or on school routes. Nonetheless, because there will be low labour influx expected the risk is moderate. |
| Are women working near men without supervision? | Likely | Substantial Risk | Project workers will be supervised but there is the possibility that men and women may work in proximity, given the nature of the activities. |
| Is there a National Action Plan on Addressing Violence Against Women and Girls/GBV | No | High Risk | There are several legal safeguards and laws enacted by India on gender aspects. These have been referenced in Section 2.1 However, there is no National Action Plan on Addressing Violence Against Women and Girls/GBV |
| Is there at the National level SEA/SH Working Group | No | High Risk | There are several legal safeguards and laws enacted by India on gender aspects. These have been referenced in Section 2.1. There is a National Commission for Women at the central level and state level commissions for women. |

²⁹ https://www.niti.gov.in/sites/default/files/2021-11/National_MPI_India-11242021.pdf

| | | | |
|--|--|---------------|--|
| Is there a National referral protocol for SEA/SH Service Provision | Yes | Low Risk | There are several NGOs and civil society organisations working on sexual violence. There are also helpline such as 1090, 1091, and helplines listed in women commissions websites. Ministry of Women and Child Development also runs a portal known as shebox.nic.in for complaints regarding sexual harassment at workplace. |
| Does the project have the capacity to monitor the risks of harassment and gender-based violence throughout the scope and cycle of the project? | Yes | Low Risk | Yes, the project will adopt and resource SEA/SH Prevention and Response Plan and engage a SEA/SH/GBV expert. |
| Do the project beneficiaries know where to get help regarding SEA/SH? Are there police stations with SEA/SH Desks? Are there toll free SEA/SH reporting telephone lines? | Yes | Moderate Risk | There are several NGOs and civil society organisations working on sexual violence. There are also helpline such as 1090, 1091, and helplines listed in women commissions websites, shebox.nic.in. etc. These however, may not be fully accessible to people living far from urban or semi-urban areas or areas with lower phone/internet connectivity. |
| Evaluation of SEA/SH Risk in NDSP-II³⁰ | Moderate- The project involves some minor works close to residential and agricultural areas and may pose SEA/SH risks. Entrepreneurship development and capacity building may pose risks of sexual exploitation or abuse for project beneficiaries, especially women and other vulnerable groups (SC, ST, poor and marginal dairy farmers). The consolidated SEA/SH risk level is assessed as 'Moderate' through application of both Civil Work and Social Protection and Jobs tools. | | |

3. GRIEVANCE MECHANISM (GM)

3.1 Support Service

Support services in the project areas will be accessed through NDSP-II reference, networking, and in coordination with other stakeholders. It is in the interest of the project team to identify the existing service providers beforehand and provide a referral pathway for the project beneficiaries, workers and nearby communities. The support services, include amongst others:

- Provision for accessible information on services available to survivors of GVB;
- Provision of accessible, effective, and responsive health, social welfare, police, prosecutorial, and other services to redress cases of GBV;
- Provision of specialized facilities, including support mechanisms for survivors of GVB; and
- Provision of effective rehabilitation and reintegration programs for perpetrators of GBV.

³⁰ Rating provided by World Bank

3.2 Grievance Redressal Mechanism

The project will be required to put in place a GRM with multiple channels to facilitate confidential logging in of GBV complaints in all the project locations. It will be necessary to identify and integrate GBV including SEA/SH entry points within the GRM with clear procedures and tools for safe, confidential, and ethical management of related complaints. Considerations related to GBV will be integrated into GRM explicitly developed for project workers.

As part of the overall project, consultations on the GRM with affected communities (particularly with women, girls and people living with disabilities) will be done to determine the preferred alternatives to in-person complaints (e.g., phone, online, other). The process will emphasize confidentiality and anonymity. This project GRM will adapt lessons from other projects to strengthen accountability to communities and identify a range of issues by holding periodic team meetings to discuss any workplace concerns.

In setting a up a GRM to facilitate resolution of GBV complaints, the project will be guided by the following principles:

- *Confidentiality*: At all stages of the intervention, the privacy and confidentiality of survivors will be assured, prioritizing the well-being of survivors and that the delivery of services and support will not compromise the privacy or identity of individuals involved.
- *Respect*: Respect of the wishes, dignity and choices of the survivors will be observed at all times and during all stages of any intervention. Survivors will be supported to give their free and informed consent, based on a clear understanding of the facts, implications, risks, and consequences of an action, before information is shared or action is taken.
- *Safety and security*: Awareness and consideration of any risks or safety concerns that might compromise the physical safety of individuals affected by GBV will be sufficiently addressed and factored into any GBV intervention or initiative.
- *Non-discrimination*: All SEA interventions will be designed to ensure access and the same level of quality of care and assistance for all persons seeking support, or persons affected by SEA, without regard to sex, sexual orientation, gender identity, age, ethnicity, religion, or other status.
- *Trust and Legitimacy*: The grievance mechanism shall be made to be credible in the eyes of its intended users. The stakeholders need to have confidence that if they lodge a complaint, it will be treated in a fair and objective manner. Both the process and its outcomes are important for establishing trust in the mechanism.
- *Cultural Appropriateness* : A grievance mechanism shall be designed to take into account specific cultural attributes as well as traditional mechanisms for raising and resolving issues. This will ensure that the concerns of significantly different groups and sub-groups are received and addressed.
- *Rights-Compatibility and Equity*: The GRM shall promote processes and agreements based on decisions that promote equity and human rights. Companies should note that the grievance mechanism would not be a substitute for, nor should it undermine, a complainant's right to pursue other judicial or non-judicial avenues of remedy.

The project GRM will implement a survivor-centered approach to managing GBV (and SEA/SH) complaints including the use of SEA/SH victims' referral centres. The focus of GRM would be based on confidentiality to protect the privacy and choices of the victim, and urgency to preserve evidence and access assistance and care for the victim. For these reasons the complaint is not expected to follow a uniform pattern. The complainant will be free to use any avenue to report including text message, email, phone call, written note, or word of mouth in person to trusted colleague, member of the GRM, GVB (and SEA/SH) service provider,

or local NGO, among others. If the complaint is received by any other person or entity other than the designated SEA/SH services provider, the case should be referred as soon as possible thereafter to the service provider.

The process of assistance will follow the steps below. The person that receives the complaint/report will inform NDSP-II Project Coordinator immediately. The person-in-charge will arrange for any required emergency support and care in coordination with the designated GBV (and SEA/SH) service provider and simultaneously refer the case to the service provider. In the meantime, project will report any GVB (and SEA/SH) incident to the Bank within 48 hours.

The only information to be collected from the person reporting will be on:

- The nature of the complaint (what the complainant says in her/his own words without direct questioning);
- If, to the best of the survivor's knowledge, the perpetrator was associated with the project;
- If possible, the age and sex of the survivor; and
- If possible, information on whether the survivor was referred to services.

The project will put in place the necessary mechanisms to address GVB. The proposed mitigation measures as per the risk level in the current project are as follows:

- Define GBV (and SEA/SH) requirements and expectations included in the contractual obligations as well as reinforce Code of Conduct (CoC) that address GVB in the project locations to cultivate an environment free from GBV (and SEA/SH) as well as regular dissemination of the CoC to the workers;
- Designate a GBV specialist is in place to support SEA/SH risk management measures;
- Develop and deliver information, education, and communication materials for stakeholders to indicate that the project and/area is a SEA/SH free zone, as well as provide information on SEA/SH response services (such as hotline numbers and where to seek assistance when needed). Other information to be highlighted include:
 - No sexual or other favors can be requested in exchange for services;
 - Project staff are prohibited from engaging in GBV and this information should be clearly spelt out during training and other forms of communication to the staff;
 - Any case or suspicion of GBV should be reported to [hotline number, GRM or citizen engagement/feedback mechanism];
 - Information on protection of whistleblowers; and
 - The range of services available for survivors including healthcare, protection and psychosocial care.
- Identify and map GBV (and SEA/SH) service providers to ensure information is made available to health service providers on where psychosocial support and emergency medical services for survivors of SEA/SH can be accessed (within the healthcare system);
- Develop GBV (and SEA/SH) prevention policy and response procedures that outline key requirements for reporting cases if they arise, measures to enable safe, ethical, survivor-centered response and disciplinary processes;

- Train all project staff and workers (where feasible) and integrate understanding of the CoC, SEA/SH as well as accountability and response framework including the referral processes, responsibilities and reporting in other trainings; and
- Utilizing the GRM developed under the project with a separate channel to manage GBV related complaints to enable reporting in a safe, confidential survivor-centric manner. Cases of GBV can be reported through the general Project GRM – through the suggestion box, or through the GRM Hotline Operator, phone calls, emails etc. to be developed). The project GRM will ensure all incidents of GBV including SEA/SH reported either through the general GRM system or any other source are relayed to the Bank within 48 hours.

3.2.1.1 GBV Referral Pathway

Referral systems need to be established based on a coordinated mapping and/or assessment of services and understanding of the capacities of the service provider; while also taking into consideration the local context in India. The quality of services should also be documented and monitored over time to ensure they are functional and meet minimum standards of care, in line with the GBV guiding principles. It is important that referral systems prioritize survivor safety and confidentiality and respect survivors' choices, recognizing that even with all services in place, survivors may still choose or decide not to access care. Further, the strength and efficiency of a GBV referral system depends on how much it is considered as being available and accessible by women and girls and their families. Thus, it is also important to undertake awareness building activities to create an environment for women and girls to be able to seek support through such a referral pathway; given the understanding that speaking about and reporting cases of GVB is largely stigmatized in the country and is directly related to concerns about women and community/family honour.

A functional GBV referral system includes the following key elements³¹:

- At least one service provider for health, psychosocial, safety and protection and, as appropriate and feasible, legal and other support, in a given geographical area;
- Services are delivered in a manner consistent with the GBV guiding principles;
- GBV service providers understand how and to whom to refer survivors for additional services;
- GBV service providers demonstrate a coordinated approach to case management, including confidential information sharing and participation in regular case management meetings to ensure that survivors have access to multi-sector services;
- GBV data collection, including standardized intake and referral forms, is undertaken in a safe and ethical manner;
- Referral pathways identify all available services and are documented, disseminated and regularly assessed and updated, in a format that can be easily understood (e.g. through pictures/diagrams);
- GBV service providers have a space to coordinate survivor response issues.

In addressing GBV risks and incidences, a key strategy is to liaison with GBV Services Provider(s) and community-based organizations that are able to support the project in addressing any case of GBV that may be project related, while also working to proactively prevent such cases³².

Key steps in Referral Pathways for SEA/SH

- **Seeking Help/ Disclosure:** The survivor may inform someone trustworthy about the incident- such as a family member, friend, community member, local ASHA workers, authorities etc. On the other hand, the survivor may also choose to approach a service provider such as a police station or a hospital or call a helpline number themselves. If the survivor confides in someone, the person will accompany them to any service entry points here; if the survivor wishes to approach a service provider. Alternatively, the Project may also be involved (even if not the first point of contact). The survivor should not be pressurized into seeking additional services; the decision may be supported by others but needs to be up to the individual survivor whether to take the referral service or not.
- **Service Entry Point:** Depending on the entry point, the survivor may either file a case at the police station first or visit the hospital/ one stop crisis centre for medical care. Post this, the survivor may or may not choose to pursue legal action or file a case at the police station. In case the survivor chooses to seek only psychosocial assistance, they may seek help from a local NGO listed for counselling and mental health support. Lengthy legal procedures, family/community stigma, pressures/threat/fear of perpetrators may dissuade survivors and their families from seeking legal action.
- **Legal services:** In situations where the survivor and their family members decide to take legal recourse, the NGO involved will support them to plan for legal action as well as a dedicated NGO representative will be present with the survivor to guide them through the whole process.
- **Safe shelters:** In some cases, the survivor may be required or want to go to a safe shelter for protection and security.

Some other additional key points regarding the GBV referral pathway is as follows:

- NGOs enlisted as service providers in the referral pathway should be engaged in stakeholder engagement and consultation processes to actively promote favourable attitudes w.r.t gender as well as a supportive environment for women and girls to
 - actively pursue education and career options;
 - delay age at marriage;
 - increase awareness of gender and sexuality;
 - facilitate and strengthen women's agency and decision making capabilities;
 - provision of support structures and safe spaces at community levels to women and girls discuss personal struggles and concerns; as well as
 - reduce stigma and victim-blaming at community levels w.r.t GBV/SH/SEA cases
- Project Social/GBV Coordinator may not be actively involved in the case but will be responsible for documentation, follow up and overall assistance to the survivor.
- The Social/GBV Coordinator will be responsible for drawing up SOPs for the referral service providers, selection and finalization of the service providers as well as training and mentoring support to them.
- The Social/GBV Coordinator will be responsible for monitoring and review of GBV cases reported as well as final outcomes. The Social/GBV Coordinator will also undertake half yearly reviews of the performance of service providers and present their findings; based on which a decision may be taken by the PMU Apex level whether to continue with the same service provider or change the service provider (if such as option is possible). In cases where changing a service provider is not possible,

actions will be taken to undertake additional training and supervision for such service providers (for instance, police persons).

- All service providers, NDDB staff as well as contractors will be aware of the GBV referral pathway and shall be trained. All staff, union members, suppliers, etc. who come into daily contact with community will be trained on how to respond a GBV/SH/SEA case sensitively using a survivor centred approach and steps to be undertaken.
- The GBV referral pathway along with contact numbers will be displayed at all milk collection centres, CMCs and other facilities under the project.

4. GBV PREVENTION AND RESPONSE ACTION PLAN

This section provides a summary of the prevention and response plan for GBV including SEA/SH to be customized for use in NDSP-II. The NDDB staff will include a GBV consultant who will Coordinate sensitization of all project structures on SEA/SH. The consultant will also be involved in mainstreaming of the SEA/SH issues into all project activities at the NDDB. The SEA/SH issues will be cascaded to the sub projects level by the social safeguards officer of NDDB.

Table 1-2 GBV Action Plan

| | Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|----------|--|--|---|--------------------|--------------------------------------|---|
| 1 | Coordination, Networking and Partnership | | | | | |
| A | To develop an integrated and comprehensive plan that will focus on the process of addressing GBV. Hence, the need to form strong alliances with key bodies such as the State Government, the Central Government, milk unions, district offices, departments of women and child development, local NGOs and civil society organizations, the local community etc. | <p>Agree on which stakeholders will constitute the GBV management team.</p> <p>Develop terms of reference that will guide the GBV management team.</p> <p>Hold workshops for the GBV management team.</p> <p>Develop operational guidelines</p> <p>Offer training that will equip the team to engage with the rest of the project team with integrity while inculcating various tools that will deal with GBV including SEA/SH</p> | <p>First 6 months for Constitution of GBV management Team and initial training.</p> <p>Follow up training annually which will include sharing of practical experiences.</p> | NDDDB and POI | Project Coordinator | <p>GBV Management Team Constituted and functioning.</p> <p>Number of trainings conducted for GBV management Team</p> |
| B | The team will be responsible in ensuring that GBV including SEA/SH are regular agenda items on project coordination meetings | <p>Include the items below in the Organized regular project level meetings:</p> <ul style="list-style-type: none"> ■ SEA/SH agenda ■ Reports and updates ■ Follow up actions | Ongoing- quarterly basis | NDDDB and POI | Project Coordinator | <p>Number of monitoring of project meetings held with GBV including SEA/SH as an agenda item</p> <p>Percentage of cases/issues/concerns followed up</p> |
| 2 | Mapping out SEA/SH Prevention and Response Service Providers | | | | | |

| | Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|---|---|--|--|---------------|-------------------------------|---|
| a | <ul style="list-style-type: none"> ■ Map out GBV service providers for survivors of SEA/SH in project areas. Efforts should be made to map out service providers at a district level at least, or where the service providers are accessible. ■ Undertake social cultural environmental mapping to identify stakeholders for response mechanism in relation to SEA/SH contexts ■ Mapping of existing Service providers will be undertaken and those mapped will include CBOs, NGOs, and other civil society organizations. | <ul style="list-style-type: none"> ■ Conduct field visits and or remote(desk) review to identify and map the existing services, entry points for survivor assistance, and local stakeholders working on the prevention of and/or response to gender-based violence. ■ Towards achieving this the following will be undertaken: <ul style="list-style-type: none"> ○ Conduct a desk review of SEA/SH service providers in the six states. ○ Field visits ○ Stakeholder consultations ○ Analyze the services for survivors available in all project locations and assess their quality as per standards, including health care, psychosocial support, police, and legal/judicial services | <p>Within the 3 months</p> | NDDDB and POI | Social Specialist | GBV Service Provider Mapping report and shortlist/roster of selected service providers |
| b | Review and update GBV (and SEA/SH) referral pathway(s) in line with the mapping study | Considering the mapped out existing GBV prevention and response service providers, a referral pathway for service providers will be updated | <p>Within 3 months</p> <p>To be updated annually and maintained throughout</p> | NDDDB and POI | PMU and Project coordinator | <p>Final list of select service providers,</p> <p>Updated GBV (and SEA/SH) referral systems</p> |

| | Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|----------|--|--|--|----------------------|------------------------------------|--|
| | | Disseminate the referral pathway/list to stakeholders including service providers | project implementation. | | | |
| 3 | Capacity Building | | | | | |
| a | <p>Capacity building is aimed at strengthening the ability to handle cases of GBV including SEA/SH effectively and efficiently.</p> <p>Constitute a team and offer them relevant training that will enable them to share knowledge, detect any behaviour that might lead to SEA/SH, understand laws surrounding SEA/SH and know the channels of reporting.</p> | <ul style="list-style-type: none"> ■ Provide detailed and comprehensive training on GBV (and SEA/SH) highlighting its causes, consequences and the management and response to GBV/SEA/SH to state level teams and local team. ■ Offer training for community-based organizations, and other stakeholders on innovative approaches for prevention of, and response to SEA/SH. ■ Consolidate the teams responsible for effective research, monitoring and evaluation of SEA/SH programs and services to support generation of evidence to inform decisions. ■ Review the Contractors and consultants' contracts ■ Assess the Human Resource manuals and staff capacity ■ Prepare project code of conduct | <p>Within 2 months</p> <p>and continuous</p> | <p>NDDDB and POI</p> | <p>PMU and Project coordinator</p> | <p>Number of training sessions and staff trained to provide SEA/SH related services.</p> |

| | Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|----------|---|---|---|--------------|-------------------------------|---|
| | | <ul style="list-style-type: none"> Appoint an internal focal point in charge of reporting (who might include one in HR dept) | | | | |
| 4 | Prevention and Awareness | | | | | |
| a | <p>This is aimed at creating an understanding of the magnitude and effects of GBV (and SEA/SH) and what can be done to prevent such scenarios during and after the project.</p> <p>The step is aimed at prevention and early detection of any practices that may lead to SEA/SH. Helps to eliminate, or address any social, political, cultural tradition and religious factor that gives lee ways to SEA/SH.</p> | <ul style="list-style-type: none"> Structure a marketing and communication strategy to educate and raise awareness about GBV (and SEA/SH). Develop a communication strategy to involve stakeholders where the project is implemented for referral services for survivors of GBV (and SEA/SH) Mobilize institutions and government bodies to be in the lead of transforming culture and behavior which cause discrimination against women and girls in that community. Involve the men and young boys in developing initiatives that will bring sustainable solution for SEA/SH. Create a safe environment for girls and women to engage in project activities. | <p>Within the first quarter</p> <p>To be reviewed throughout the project implementation</p> | NDDB and POI | PMU and Project coordinators | Communication strategy and Stakeholder Mapping Report |
| 5 | Response and Support | | | | | |

| | Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|---|---|---|------------|---------------|-------------------------------|--|
| a | The main aim is to strengthen the delivery of effective, accessible, and responsive protection, care, and support services to those affected by gender-based violence. This must involve a high level of confidentiality. | <ul style="list-style-type: none"> ■ Refer and regularly update mapping report ■ Contact and mobilise various social facilities such as health, justice, legal and psychosocial support services for an effective, efficient, and human rights-based approach to GBV (and SEA/SH) mitigation ■ Provide dedicated and responsive needs-driven services to survivors of GBV (and SEA/SH). There is need for special services such as emergency transport facilities in coordination with the existing service providers and actors experienced in this aspect. ■ In reference to mapping report, enact a strong, well-coordinated and integrated multi-agency response to GVB (and SEA/SH). This includes a good structure of referral networks that are in collaboration with community, traditional and religious leaders. ■ With the help of legal personnel, update the legal and institutional framework in | Continuous | NDDDB and POI | PMU | <p>Mid-line studies/project impact evaluation studies on pre-defined KPIs</p> <p>Internal audits Grievance records</p> |

| Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|---|--|-----------|---------------|-------------------------------|---|
| | <p>harmony with the GBV (and SEA/SH) requirements to help survivors of GBV (and SEA/SH)</p> <ul style="list-style-type: none"> ■ Identify community-based safe shelters with the right personnel and outreach services for the protection of survivors of GBV (and SEA/SH). ■ Enforce the relevant law on the GBV (and SEA/SH) perpetrators and re-integration in the community to reduce repeat offenses. ■ Please refer to Section 3.2.1.1 for key steps of GBV including SEA/SH referral pathway | | | | |
| 6 Grievance Redressal Management (GRM) for GBV (and SEA/SH) Responsive Reporting | | | | | |
| <p>a The purpose for GRM is to sensitize the community on the channels available for reporting any cases of sexual harassment or sexual exploitation and abuse.</p> <p>The focus is on confidentiality to protect the privacy and choices of the survivor, and urgency to preserve evidence</p> | <ul style="list-style-type: none"> ■ Review and amend the existing GRM to ensure it meets the GBV requirements. This should create a conducive environment that is safe for the survivors to report and take shelter. ■ Guide the community and employees on the channels of reporting cases of SEA/SH and what constitutes sexual | Ongoing | NDDDB and POI | PMU and Project coordinators | Review and internal audits as well as external audits/evaluations on assessing whether survivors of sexual harassment can easily reach out to report an attempt of action of violence against them and receive a supportive response immediately. |

| | Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|----------|---|--|--|---------------|-------------------------------|---|
| | and access assistance and care for the survivor | <p>harassment as per the guidelines.</p> <ul style="list-style-type: none"> ■ Outline for the employees on penalties and disciplinary actions that will be taken against anyone against breaches of the code of conduct. ■ Please refer to Section 3.2 and 3.2.1.1 of this document on how the grievance mechanism should be operationalised and key steps of GBV and SEA/SH referral pathway | | | | |
| 7 | Monitoring and Evaluation | | | | | |
| a | <p>Monitoring is aimed at developing a set of key quantitative and qualitative indicators to manage measure and monitor the progress and effectiveness of the integrated effort to deal with GBV.</p> <p>It measures how well the policies are being adhered to, any issues that might emerge in regard to GBV (and SEA/SH) and</p> | <ul style="list-style-type: none"> ■ Develop instruments meant to measure the magnitude of reported cases of SEA/SH categorized in their various forms, such as child sexual abuse ■ Mechanism to measure effectiveness of the various support systems to respond ■ Conduct at least two-three surveys/midline/endline, or project evaluation studies to assess: project workers attitudes towards the acceptability of SEA/SH by | Ongoing, with pre-defined intervals for monitoring assessments | NDDDB and POI | PMU and Project Coordinator | Develop a set of KPIs and assess them through monitoring studies. |

| Objectives | Activities / Steps to be taken to Address GBV (and SEA/SH) risk | Timelines | Responsible | Monitoring (Who will monitor) | Output Indicators |
|--|---|-----------|-------------|-------------------------------|-------------------|
| <p>recommendation to improve any situation that may arise.</p> | <p>gender, operational aspects of SEA/SH GRM, and feedback from GBV service providers.</p> <ul style="list-style-type: none"> ■ Develop mechanisms to measure the impact of Public Education, Awareness Creation and Campaigns conducted by the SEA/SH teams. ■ From time to time set up process indicators to assess how the project is being implemented. | | | | |

APPENDIX I: INDIGENOUS PEOPLE POLICY FRAMEWORK (IPPF)

1. INTRODUCTION

1.1 Project Background

NDDB has proposed the National Dairy Support Project Phase II Project (herein after also referred as 'Project') for World Bank support with the broad objective '*To enhance competitiveness, foster inclusion, improve resilience and reduce the carbon footprint of milk value chains, focusing on small farmers in project areas*'. The Project will focus on less dairy developed States, which have been identified based on the supply infrastructure of Producer Owned Institutions (POIs) (functional Dairy Cooperative Societies (DCSSs)/ Milk Pooling Points (MPPs) coverage, milk procurement share and processing capacity) and liquid milk marketing coverage. Further, due representation has been given to the hilly & North-Eastern States. Accordingly, 6 States have been identified for the project, viz. Jharkhand, Odisha, Madhya Pradesh, Himachal Pradesh, Uttarakhand, and Sikkim. The pilot activities envisaged in the project may be located within or outside the identified Indian states.

Certain sub-activities under the Project will have direct positive impacts on milk producers at village level including scheduled tribes community members. Some of these specific sub-activities includes: 1) setting up village level institutions which includes milk collection accessories in uncovered areas, 2) strengthening infrastructure at village level like setting up BMCs, community milking centre, village level milk pasteurization and product manufacturing etc. 3) Extension and awareness programs at village level including awareness through Radio Samvad etc.

1.2 Purpose of IPPF

In line with broad objective of NDSP Phase-II Project, this Indigenous People Planning Framework (IPPF) document intends to guide NDDB and Producer Owned Institution (POIs) that will be engaged in project execution, with following key objectives;

- To enhance participation of the tribal households who are either engaged in in dairying or plan to engage in dairying activities in project implementation area;
- To avoid adverse impacts of projects on Indigenous Peoples, if at all envisaged during project implementation or when avoidance is not possible, to minimize, mitigate, and/or compensate for such impacts.
- To promote project implementation benefits and opportunities for Indigenous Peoples in a manner that is accessible, culturally appropriate, and inclusive;
- To promote the opportunities by way of convergence with their active tribal development government schemes to optimize the benefits for tribal households in project area;
- To promote local support by establishing and maintaining an ongoing relationship with tribal community in project area, based on meaningful consultation, specifically with those who may have any sort of direct or indirect adverse impact throughout the project's life cycle; and
- To recognize, respect, and preserve the culture, knowledge, and practices of Indigenous Peoples and to provide them with an opportunity to adapt to changing conditions in a manner and in a period acceptable to them.

1.3 Indigenous People in Target States of the Project

ESS-7 defines Indigenous Peoples (also referred as Scheduled Tribes in the context of India) as a distinct social and cultural group possessing the following characteristics in varying degrees:

- Self-identification as members of a distinct indigenous social and cultural group and recognition of this identity by others;
- Collective attachment to geographically distinct habitats, ancestral territories, or areas of seasonal use or occupation, as well as to the natural resources in these areas;

- Customary cultural, economic, social, or political institutions that are distinct or separate from those of the mainstream society or culture; and
- A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.

Tribal population in Target States

Madhya Pradesh, Jharkhand and Odisha are the three states where significant number of tribal population are living. Major tribal groups in Madhya Pradesh includes Bhil, Gond, Kol, Korku, Sahariya and Baiga. In Jharkhand, main tribal communities includes Munda, Santhal, Gond, Khond, Kol, Orna and Ho. In Odisha, main tribes are Khanda, Birhor, Bondo, Chuktia Bhunjia, Didayi, Juang, Kharia, Dongria Kondh, Lanjia Saora, Lodha, Mankidia, Paudi Bhuyan and Saora etc. distribution of ST population in these six states are provided in table below.

Table 1-3 Scheduled Tribes population percentage in Target States

| S. No | States | Total Population of State | % of ST population in the state |
|-------|------------------|---------------------------|---------------------------------|
| 1 | Himachal Pradesh | 6,864,602 | 5.7% |
| 2 | Uttarakhand | 10,086,292 | 2.9% |
| 3 | Jharkhand | 32,988,134 | 26.2% |
| 4 | Odisha | 41,974,218 | 22.8% |
| 5 | Madhya Pradesh | 72,626,809 | 21.1% |
| 6 | Sikkim | 610,577 | 33.8% |

Source: Census 2011 data

2. LEGAL AND INSTITUTIONAL FRAMEWORK

In order to safeguard Tribal population and to empower them, there are also important legal provisions to safeguard their interests like: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, the Scheduled Castes and Scheduled Tribes: (Prevention of Atrocities) Rules, 1995, provision of Scheduled Areas under 5th Schedule of the Constitution and Panchayat Extension to Scheduled Areas (PESA) Act to safeguard their rights and development. In compliance with these constitutional provisions, and in accordance with the World Bank's ESS-7 on Indigenous People, this Indigenous People's Policy Framework (IPPF) document is informed by these regulations.

Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

This Act recognizes and vests forest rights and occupation on forest land in forest dwellings to scheduled tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded. The Act provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. The act also delineates the process of establishing individual and community rights under section 3 (1) wherein Gram Sabha through the Forest Rights Committee (FRC) is empowered to initiate the process for determining the nature and extent of individual or community forest rights or both that may be given to the forest dwelling communities.

The Scheduled Castes and Scheduled Tribes: (Prevention of Atrocities) Rules, 1995

This Act provides for specific provisions to prevent atrocities on the Scheduled Castes and the Scheduled Tribes and suggests State Governments to frame rules for the same. These include identification of areas where atrocity may take place or there is an apprehension of re-occurrence of an

offence under the Act. The State Government is required to set up a “Scheduled Castes and the Scheduled Tribes Protection Cell” at the state headquarters headed by the Director of Police, Inspector-General of Police. This Cell is responsible for, conducting survey of the identified area, maintaining public order and tranquility in the identified area; recommending deployment of special police or establishment of special police post in the identified area; and restoring the feeling of security amongst the members of the Scheduled Castes and the Scheduled Tribes. It can be summed up that the protective provisions safeguard Indigenous people from social injustices and all forms of exploitation, while the developmental provisions promote special care for the educational and economic interests of the weaker sections like the Indigenous s and SCs. Further, administrative provisions under the Fifth and Sixth Schedules give special powers to the state for the protection and governance of Indigenous areas and the reservation provisions ensure due representation in legislative bodies and government jobs.

Provision of Scheduled Areas under 5th Schedule of the Constitution

In order to protect the interests of the Scheduled tribes, the provision of “Fifth Schedule” is enshrined in the Constitution under article 244 (2). The Fifth Schedule under article 244 (2) of the Constitution defines "Scheduled Areas" as such areas as the President may by Order declare to be Scheduled Areas after consultation with the governor of that State. Some districts across the country are listed under Schedule V of Indian Constitution that are habited with significant tribal population. Although specific criteria for identifying Schedule V area is not spelt out in the constitution. However the common characteristics in these areas are;

- Preponderance of tribal population in the area;
- Under-developed nature of the area; and
- Marked disparity in economic standard of the indigenous people/ Scheduled Tribe community/ies.

Only four out of six target states for project implementation have scheduled V areas and these states are Himachal Pradesh, Jharkhand, Madhya Pradesh and Odisha. Other states i.e. Uttrakhand and Sikkim do not have any such area.

Panchayat Extension to Scheduled Areas (PESA) Act

The 73rd Constitutional (Amendment of 1992), accommodates special powers to PRIs, were later extended, with separate provisions to the Scheduled Areas as well through the Panchayat (Extension to the Scheduled Areas) Act of 1996. With the strength and support of PESA Act, 1996 the Panchayat Raj Institution (PRI) bodies at the district and village level have been vested special functional powers and responsibilities to ensure effective participation of the Indigenous people in their own development. The Act empowers Gram Sabha of the Scheduled areas to approve plans, programs and projects for social and economic developments before such plans, programs and projects are taken up for implementation at the village level. The Act also helps preserve and conserve traditional rights over natural resources. A summary of powers given to PRIs under PESA Act is given below:

Table 1-4 Powers given to Gram Sabha under PESA Act

| Gram Sabha | Gram Panchayat | Block Panchayat | Zilla Parishad |
|--|--|--|---|
| Listing of development projects for execution through Gram Panchayats. | Enforcement of prohibition of regulation or restriction of the sale and consumption of any intoxicant. | The powers of control and supervision of activities of various organizations and individuals and their office bearers engaged in social work | Approval to obtain concession for raising minor minerals, lease and licenses for mining activities or auctioning of minor mineral products. |
| Identification and recommendation of beneficiaries under | The ownership of Minor | | |

| | | | |
|--|---|--|--|
| <p>poverty alleviation programs.</p> <p>Any proposal/ plan presented by the Gram Panchayats needs prior consultation and approval with the Gram Sabha.</p> <p>Prior approval for collection of taxes.</p> <p>Wherever necessary asking for information from gram panchayats.</p> <p>Intervene in conflict resolution through traditional and customary traditional methods if required.</p> <p>Gram Sabha has power to safeguard the cultural identity, community resources and dispute resolution per traditional customs and regulations.</p> <p>Control and supervision of functions and powers of Gram Panchayats.</p> | <p>Forest Produce.</p> <p>Prevention of alienation of land and restoration of any unlawful land of a Scheduled Tribe.</p> <p>Control over the money lending to the Scheduled Tribe.</p> | <p>Consulting the Gram Sabha wherever necessary.</p> | <p>Prior approval of Zilla Parishad, for land acquisition or rehabilitation of affected people with or without consultation with the Gram Sabha.</p> <p>Planning and management of minor water bodies.</p> |
|--|---|--|--|

3. POTENTIAL POSITIVE AND ADVERSE IMPACT ON INDIGENOUS PEOPLE

The project will help in making dairying as a sustainable livelihood option for the milk producers and viable means to enhance their income resulting in poverty alleviation & women empowerment in the project area. Tribal population engagement in dairying has been historically quite lower in comparison to other community. Project implementation, specifically in tribal dominated areas will help in promoting ST household's engagement in dairying business and thereby contribute in enhancing ST household level income. The project also help in exploiting the opportunities for potential convergence with other active government schemes related to animal husbandry that will benefit to community member including ST households who will engage with POIs in project execution.

Likelihood of adverse impact is minimal in view of limited land requirement for implementing the project activities by POIs. In case of tribal households or tribal dominated areas, chances of land procurement related adverse impact is further reduced in view of potential legal restrictions/ safeguards enshrined in

the land procurement related regulations in the states. In the event of any land procurement or land use restrictions related impacts, POIs will follow the measures recommended in 'Resettlement policy Framework (RPF)' document that is prepared as part of Project ESMF. Other potential risks associated with tribal communities in the context of project may include:

- Social exclusion and geographical isolation (small or remote tribal habitations not being covered by the milk routes) of tribal dairy farmers that may pose entry barriers to accessing the procurement and extension services offered by the project or leveraging improved markets,
- Exclusion from taking up membership and leadership roles within POIs,
- Lack of adequate consultation with tribal dairy farmers, during preparation of POIs level Integrated sub-plans,
- Lack of delivery of technical knowledge and advisories in a culturally appropriate manner, and
- Lack of alignment between customary cattle rearing practices of tribal communities and the scientific feeding and breeding package of practices promoted by the project.

4. FRAMEWORK FOR MEANINGFUL CONSULTATION AND ENGAGEMENT WITH INDIGENOUS PEOPLE

4.1 Principles for engagement with Tribal community

POIs will make sure that their field level functionaries follow the principles as mentioned below while engaging with tribal communities in their respective project implementation area;

- Indigenous Peoples should be given priority in the consultation and decision-making processes, especially project activities are likely to pose potential adverse impacts to them as an individual or as a community;
- POIs must undertake a risk screening to scope out any adverse that tribal community might suffer during and after the project implementation as well as receive culturally compatible social and economic benefits;
- POIs ensure at all times that project implementation will foster full respect for the Indigenous Peoples' dignity, human rights and cultural uniqueness.
- Consensus of tribal members in the project area must be determined in accordance law, while recognising their respective customary laws and practices, free from any external manipulation, interference and coercion, and obtained after fully disclosing the intent and scope of the Project activity, in a language and process understandable to the community;
- Access to a culturally appropriate GRM for tribal community;
- Project activities requiring site selection (like community milking centre) must at all times be consistent with the traditional and cultural practices of the tribal community in the area;
- Any potential impacts envisaged by land procurement or land use restriction due to any sub-project of NDSP Phase 2, will be addressed by concerned POIs through preparing and implementation of site specific Indigenous People's Plan

4.2 Guidelines for Tribal Convergence

To increase the participation of the tribal population in the various development projects with the objective of increasing sustainable livelihood opportunities for them, the Central and the various State Governments have started various schemes. POIs will be recommended to identify the synergies available from the various components of active government schemes in their area that can be

harnessed to optimise the benefits under the NDSP Phase-II project. This approach will eventually add on to the benefit of tribal population and will promote their engagement with the project.

Recommended process for POIs for ensuring potential convergence opportunities, could be as follows;

- The POIs through their field level functionaries, DCS/MPP secretary etc. should utilise the available list of the tribal HHs which could be considered for possible engagement in dairying or are already engaged in dairying;
- The local field level functionaries should collate a list of related schemes on Animal Husbandry, Dairy Development or financial support available for the welfare of ST HHs in coordination with the various departments and support them in accessing them along with the NDSP2 benefits;

5. IMPLEMENTATION ARRANGEMENT

4.1 Roles and Responsibilities

The PMU-NDDB will be responsible for the operationalization and overall implementation of this IPPF. PMU-NDDB will have a dedicated Environment and Social (E&S) Cell, who will act as Nodal Officer for implementation of E&S management system. E&S Cell will seek IPPF implementation update on predefined KPIs from POIs of respective states in the monthly, quarterly and annual project implementation update report.

Table 1-5 Roles and Responsibilities for IPPF Implementation

| S. No | Entity | Responsibility in SEP implementation |
|-------|--|--|
| 1 | E&S Cell, NDDB | <ul style="list-style-type: none"> ■ Nodal agency for ensuring implementation of IPPF by POIs; ■ Ensuring that Indigenous People's Plan is prepared for relevant sub-projects by POIs on the basis of guidance provided under this IPPF document; ■ Monitoring POIs for adhering to principles of IPPF and taking updates on it through period monitoring report. |
| 2 | State Level Technical Management Committee (SLTMC) | <ul style="list-style-type: none"> ■ Monitor IPPF implementation by respective POIs of the state; ■ Provide feedback to NDDB on IPPF related matters, including periodic update and feedback received on implementation |
| 3 | State Federation | <ul style="list-style-type: none"> ■ Monitor IPPF implementation by respective POIs of the state; ■ Provide feedback to NDDB on IPPF related matters. |
| 4 | Other POIs (Milk Union, Milk Producer Companies, FPO etc.) | <ul style="list-style-type: none"> ■ Implement actions as proposed in IPPF with the guidance from NDDB; ■ Ensure preparation and implementation of IPPs for relevant sub-project in accordance with IPP template and guidance as provided under this IPPF document. ■ Will ensure arrangement of required budget and resources for implementation of IPPF ■ Maintain records for monitoring like consultation minutes with ST indigenous community, engagement plan, period training to field level functionaries on engagement with ST community etc. |

5.1 Training on IPPF implementation

NDDDB will orient POIs at the beginning of project implementation on ESMF including specific expectation on IPPF implementation by POIs in the field. Further, field level functionaries and other staff of POIs responsible for community engagement, will be provided training and refresher on broad objectives and process of IPPF implementation. This will include training on kinds of documentation to be maintained for reporting purpose.

5.2 Monitoring and Reporting and Disclosure of IPPs

Performance of POIs on IPPF implementation will be assessed based on following monitoring and reporting activities.

- Consultation records with tribal community by POIs;
- GRM records including grievances received from tribal community including action taken report;
- Details of ST households engaged in project activities of POIs;
- Preparation, disclosure and implementation of IPPs for relevant sub-projects by POIs.

ANNEXURE 1 (TO IPPF) : INDIGENOUS PEOPLE'S PLAN (IPP) TEMPLATE

Requirement of IPPs will be triggered wherever ST communities are identified amongst those who gets adversely impacted by any of the sub-projects. In case of any involuntary land related impacts or land use restrictions, their mitigation measures will be informed by Resettlement Policy Framework (RPF) screening checklist prepared for the project.

The IPP, wherever it needs to be prepared for specific sites, should include following information;

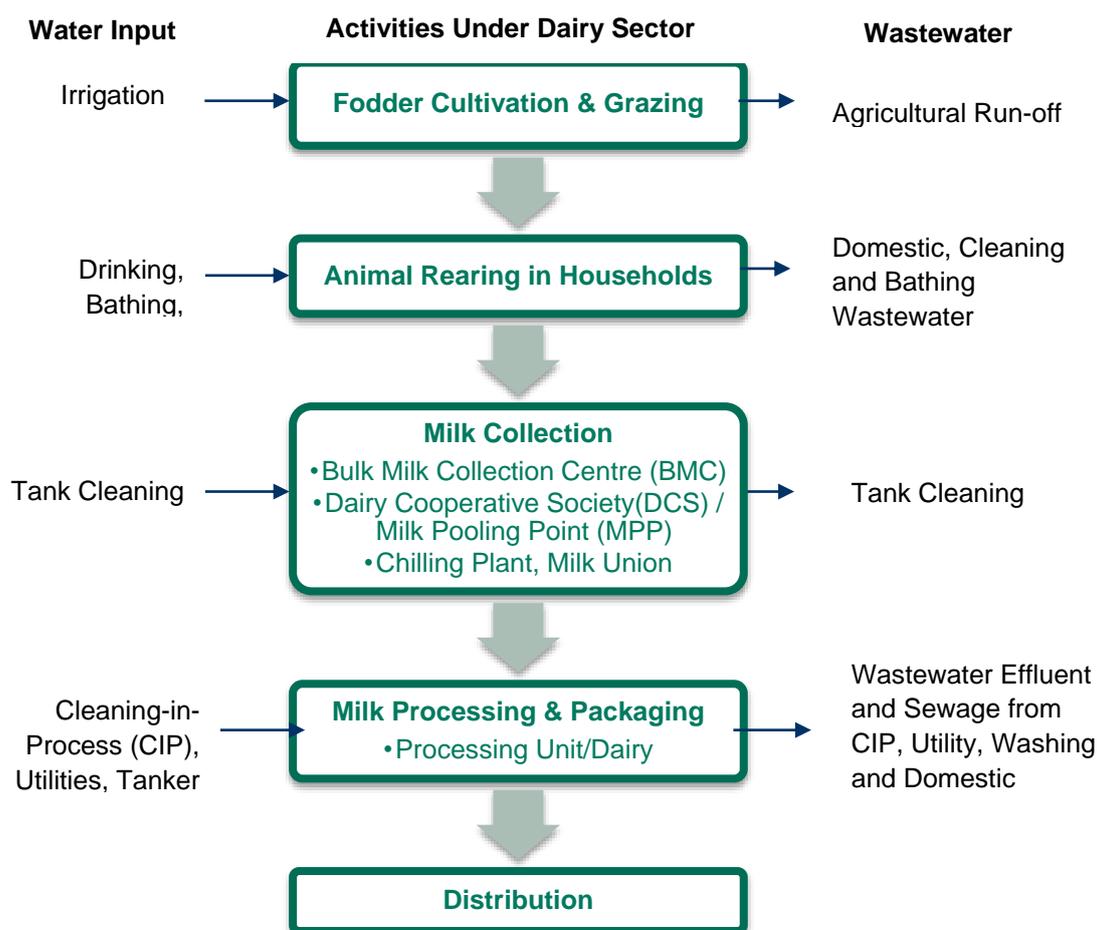
- 1) A summary of the risks and impacts under the sub-project where ST communities are getting impacted. This should also include the applicable legal and institutional framework and baseline data or profile of the affected ST communities;
- 2) A summary of the results of the meaningful consultation undertaken by POIs with the affected ST families;
- 3) Measures for ensuring that affected ST communities receive social and economic benefits of the project that are culturally appropriate and gender sensitive and steps for implementing them;
- 4) Measures to avoid, minimize, mitigate, or compensate affected ST families for any potential adverse impacts that were identified in the risk assessment, and steps for implementing them;
- 5) The cost estimates, schedule, and roles and responsibilities for implementing the IP Plan;
- 6) Accessible appropriate procedures to address grievances by the affected ST families arising from project implementation; and
- 7) Provision for monitoring, evaluating, and reporting on the implementation of the IP Plan, including ways to consider input from project-affected ST families in such mechanisms.

APPENDIX J: RESOURCE CONSERVATION STRATEGY

1. INTRODUCTION

The baseline is drawn from stakeholder consultations and primary survey of households, consumers, and retailers in the five targeted states: Himachal Pradesh, Uttarakhand, Madhya Pradesh, Jharkhand, and Odisha. The baseline captures key trends and implications of water related indicators in the context of the dairy sector.

Survey of 1500 households was conducted across each of the five (05) states to understand the water sources, seasonal variance, water and wastewater management systems adopted. Further, focused group discussions were undertaken with the Bulk Milk Collection Centre (BMC) in all the five (05) states to identify the water management practices followed.



At the village level, the farmers form a co-operative society, which establishes the 'milk collection centres'. The society collects milk twice a day and delivers it to the milk collection centres where the milk is weighed, tested and the price paid to farmers. The village society supplies/sells milk to its own District co-operative dairy plant. It transports milk in cans by trucks or through insulated road milk tankers, preferably via a chilling centre.

Besides milk collection, the society also provides the technical input services such as veterinary aid; concentrated cattle feed and fodder seeds. They also give counselling to the society members to enhance milk production.

Further, Milk Union carries out important functions like procurement, processing and marketing of milk and milk products, providing technical inputs, etc.

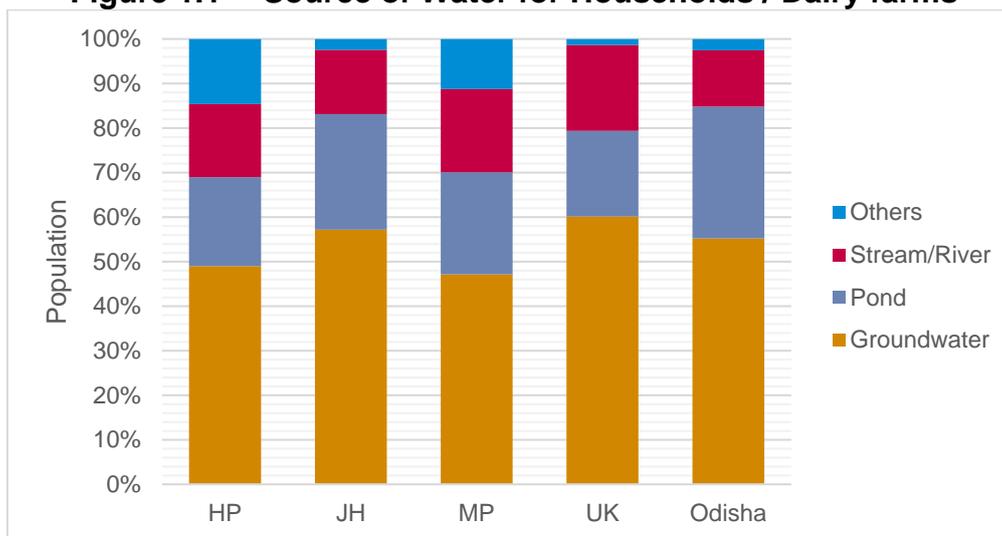
2. WATER AND WASTEWATER PRACTICES IN HOUSEHOLDS

2.1 Source of Water

The key activities for the households involved in animal rearing includes grazing, shed cleaning, cleaning of animals, cow-dung management, stall feeding, milking, processing of milk, milk selling and fodder collection. The water is required for irrigation (growing fodder), cleaning the animals, shed and drinking purpose for animals.

Error! Reference source not found. below represents the distribution of water sources used in different states for Households involved in rearing of cattle.

Figure 1.1 Source of Water for Households / Dairy farms



Observations:

- The source of water in all the five (05) states includes Groundwater (borewell/ dug well), pond stream/river and others (tap water, piped water from regulators).
- Groundwater forms the major water source for 47% to 60% households surveyed with Uttarakhand having the highest number of households dependent on groundwater (60%).
- About 1-15% households depend on some other uncategorized like tap water, piped water, government supply.

2.2 Status on Water Resources

Groundwater Block Categorization³³

The assessment of Ground water resources carried out by Central Ground Water Board (CGWB) Department of Water Resources determines the prevailing status of ground water resources in the country. It also helps assess the impact of the on-going ground water management practices on the groundwater resources.

The categorisation based on status of ground water quantity is defined by Stage of Ground Water Extraction as given below:

The stage of ground water extraction is defined by,

$$\text{Stage of GW Extraction} = (\text{Existing gross GW extraction for all uses} / \text{Annual Extractable Groundwater resources}) \times 100$$

³³ National Compilation on Dynamic Ground Water Resources of India, 2022; Central Ground Water Board Department of Water Resources, River Development & Ganga Rejuvenation Ministry of Jal Shakti Government of India

The existing gross ground water extraction for all uses refers to the total of existing gross ground water extraction for irrigation and all other purposes.

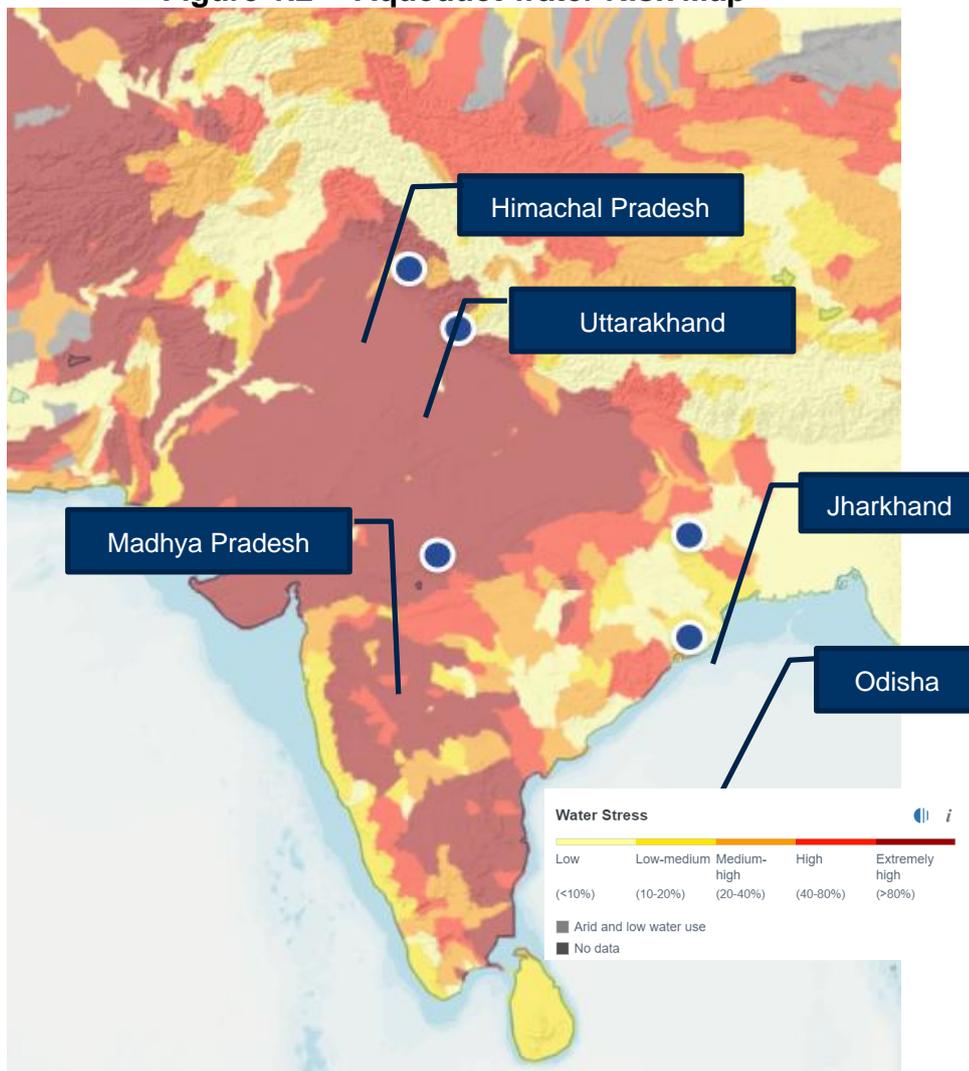
Table 1.6: Stages of Ground Water Extraction

| Stage of Ground Water Extraction | Category |
|----------------------------------|----------------|
| ≤ 70% | Safe |
| > 70% and ≤90% | Semi-critical |
| > 90% and ≤100% | Critical |
| > 100% | Over Exploited |

WRI Aqueduct

Baseline water stress measures the ratio of total water withdrawals to available renewable surface and groundwater supplies. Water withdrawals include domestic, industrial, irrigation, and livestock consumptive and non-consumptive uses. Available renewable water supplies include the impact of upstream consumptive water users and large dams on downstream water availability. Higher values indicate more competition among users.

Figure 1.2 Aqueduct water Risk Map



Source: WRI Aqueduct Water Risk Atlas

Table 5.2: Water Stress Situation in the five selected states

shows the Water Stress Situation across the five states with respect to GW categorization and WRI Aqueduct output.

Table 1.7: Water Stress Situation in the five selected states³⁴

| State | Dependency on Groundwater | GW Categorization | Baseline Water Stress | Annual Average Rainfall (mm) |
|------------------|---------------------------|--|-----------------------|------------------------------|
| Himachal Pradesh | 49% | Safe | Medium - High | 1052.2 |
| Uttarakhand | 60% | Safe: 79% Semi-critical: 22% | Extremely High | 1373 |
| Jharkhand | 57% | Safe: 92% Over-exploited: 2% Critical - 2% Semi-critical: 4% | Low | 1222.7 |
| Madhya Pradesh | 47% | Safe: 71% Over-exploited: 8% Critical - 2% Semi-critical: 19% | Extremely High | 1102.2 |
| Odisha | 55% | Safe: 95% Semi-critical: 3% Saline: 2% | Low | 1635.9 |

Note: All the districts that were surveyed fall under the 'safe category' of groundwater block categorization.

2.3 Observations

2.3.1 Himachal Pradesh (HP)

- HP receives significant rainfall in all seasons with an annual rainfall of 1052.2 mm. However, no rainwater harvesting practices are being followed.
- Hilly and mountainous parts with steep slopes mainly constitute the runoff areas and have low ground water potential.
- Data indicates that 49% of the households surveyed, rely on groundwater as the major source.
- About 71% of the households reported that the groundwater sources are not perennial, thereby indicating the need to have efficient water management systems in place.

2.3.2 Uttarakhand

- Uttarakhand receives significant rainfall in all seasons with an annual rainfall of 1373mm. However, no rainwater harvesting practices are being followed.
- Data indicates that 60% of the households surveyed, rely on groundwater as the major source.
- About 49% of the households reported that the groundwater sources are not perennial, thereby indicating the need to have efficient water management systems in place.

³⁴ Source: National Compilation on Dynamic Ground Water Resources of India, 2022; Central Ground Water Board Department of Water Resources, River Development & Ganga Rejuvenation Ministry of Jal Shakti Government of India and WRI Aqueduct Water Risk Atlas

2.3.3 Madhya Pradesh

- Madhya Pradesh receives an annual rainfall of 1102.2 mm. Only one household in Madhya Pradesh was found to collect & use rainwater.
- Data indicates that 47% of the households surveyed, rely on groundwater as the major source.
- About 67% of the households reported that the groundwater sources are not perennial, thereby indicating the need to have efficient water management systems in place.

2.3.4 Jharkhand

- Jharkhand receives an annual rainfall of 1222.7mm. However, no rainwater harvesting practices are being followed.
- Data indicates that 57% of the households surveyed, rely on groundwater as the major source.
- About 68% of the households reported that the groundwater sources are not perennial, thereby indicating the need to have efficient water management systems in place.
- As per National Compilation on Dynamic Ground Water Resources of India, 2022, the groundwater quality in the districts of Garhwa and Palamau is affected by fluoride.

2.3.5 Odisha

- Odisha receives an annual rainfall of 1635.9mm. However, no rainwater harvesting practices are being followed.
- Data indicates that 55% of the population surveyed, relies on groundwater as the major source.
- About 52% of the households reported that the groundwater sources are not perennial, thereby indicating the need to have efficient water management systems in place.

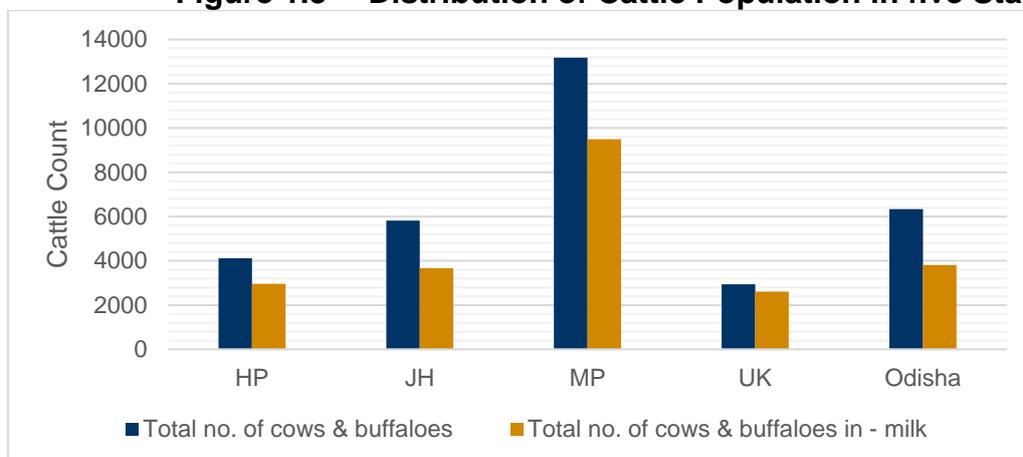
3. WATER CONSUMPTION IN HOUSEHOLDS (FOR ANIMAL REARING)

Water is one of the critically important resources required for dairy animal rearing and deriving economic value out of the animal during its lifespan. Water is essentially consumed at the following stages in the dairy sector:

3.1 Cattle Population in Households

Figure 3.1 shows the variation in cattle population across the five states.

Figure 1.3 Distribution of Cattle Population in five State



- Madhya Pradesh has the highest number of cattle with average of 9 cattle per household.
- MP is followed by Jharkhand and Odisha with average of 4 average cattle per household.
- Uttarakhand has the lowest average cattle count of 2 cattle per household.

3.2 Water Consumption for Households (Involved in Animal Rearing)

The water footprint is calculated as below:

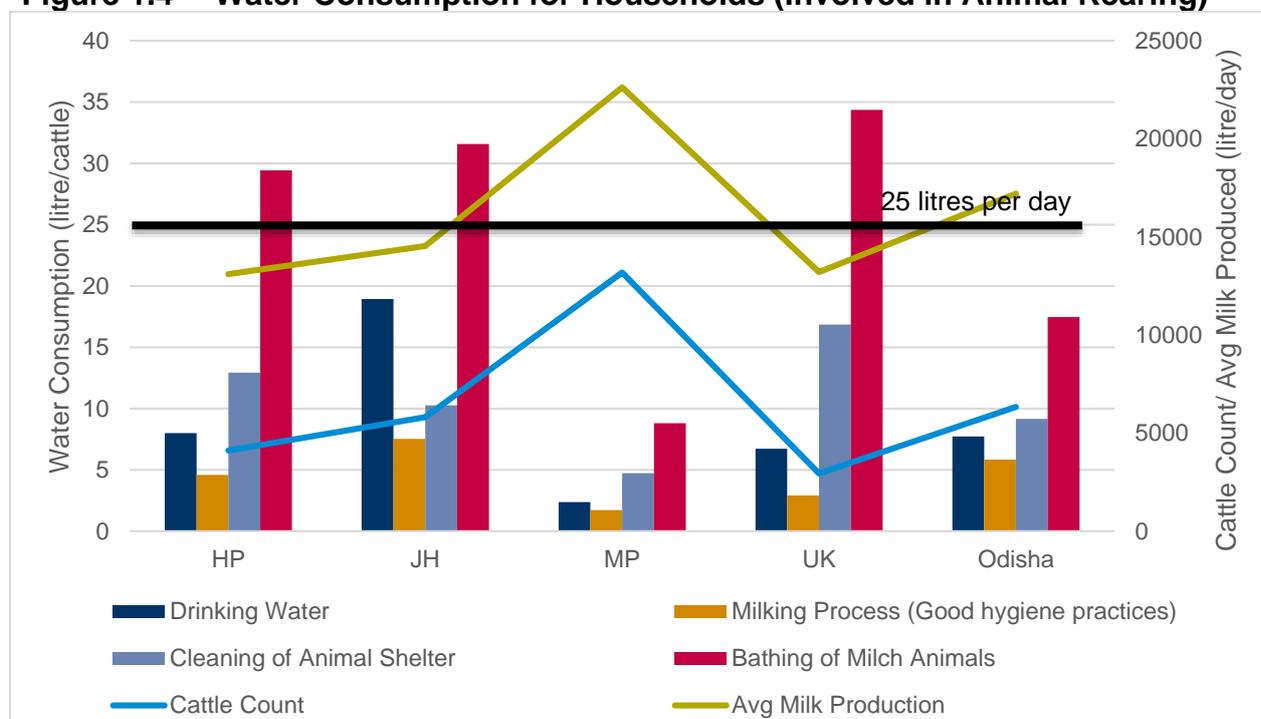
- Direct Water Use (DWU): The direct water of a product footprint refers to the freshwater consumption and pollution that is associated to the water use by producer. Direct water use in this section includes drinking, cleaning, bathing and milking process. Information has been obtained through farmer interview.

DWU= Drinking Water+ Bathing + Cleaning + Milking Process

- Consumptive Water Use = Litres/Litres= DWU/ Av. milk yield (Litres/day)

Error! Reference source not found..2 indicates the analysis of average water consumption for various activities undertaken by the households:

Figure 1.4 Water Consumption for Households (Involved in Animal Rearing)



- Across all states, *bathing of milch animals* consumes the maximum amount of water ranging from 67 litres/day to 122 litres/day.
- Literature review indicates that water intake is affected by factors such as environmental temperature, ration dry matter content and milk production. A high-producing lactating dairy cow can drink over 150 litres of water on a hot day³⁵. Average water intake ranges from 9-25 litres per day for heifer population³⁶.
- Jharkhand has the highest water consumption per cattle (68 litres/cattle) as well as per Litre of milk (27 litres per litre of milk) despite having lesser number of cattle.

³⁵ Importance of Water for Dairy Cattle by Dr. Rajesh Singh

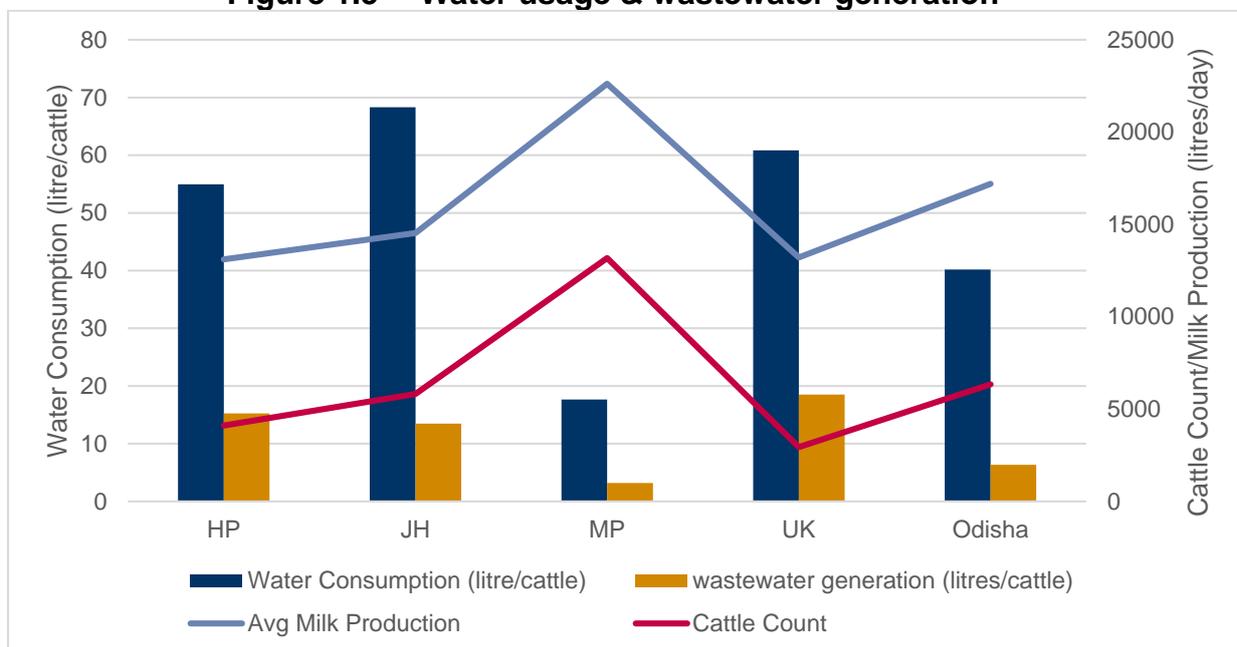
³⁶ [Water Requirements of Livestock \(gov.on.ca\)](http://www.gov.on.ca)

- Madhya Pradesh has the lowest water consumption (18 litres/cattle) while the cattle count is the highest. This indicates better water use practices in have been adopted in MP.
- The survey data indicates that the direct consumptive water use for a household ranges from 18 litres per cattle per day to 68 litres per cattle per day.
- Jharkhand, Madhya Pradesh and Odisha seem to have similar water use for cleaning & washing of animal sheds. However, the number of cattle across the three states varies widely.
- This indicates lack of efficient cleaning practices in case of Jharkhand & Odisha as compared to Madhya Pradesh.

3.3 Wastewater Generation from Households (involved in animal rearing)

Error! Reference source not found. indicates the analysis of average water consumption & wastewater generation undertaken by the households:

Figure 1.5 Water usage & wastewater generation



Key Findings

- It has been observed the wastewater generation is quite low for all states compared to water consumption. Wastewater generation as a percentage of water use is as follows:
 - Himachal Pradesh : 28%
 - Jharkhand : 20%
 - Madhya Pradesh : 18%
 - Uttarakhand : 30%
 - Odisha : 16%
- Animal Cleaning and shed washing activities are mostly undertaken using buckets.
- The survey indicated that there is no collection system for wastewater, and it is practically not possible for small households/farmers to collect and recycle the water.

- Overall, the wastewater generated through bathing, cleaning and waste removal activities is being discharged with no prior treatment. Analysis shows that daily wastewater generation ranges from 27 litre/day in Odisha to 52 litre /day in Jharkhand.
- The major environmental issues of dairy farms are discharges of dung and urinal wastewater. The poor handling of dung and wastewater causes odour problem also.
- Mostly animal waste is picked up manually and in turn used for making cow dung cakes. The waste is either disposed off in nearby fields/ waterbodies or disposed through drainage systems or it is collected and sold off.

Error! Reference source not found. shows the comparison of water use and wastewater generation across the five states along with brief on water stress

Table 1.8: Comparison of water use and wastewater generation across the five states

| State/ | GW Categorization | Average No. of Cattle /household | Average Quantity of Milk, (litres/day/ household) | Water Consumption (litres/day/ household) | Water Use per cattle (litres/cattle) | Consumptive Water Use (litres/litre of milk) | Wastewater generated (litre/day) | Remarks |
|------------------|--|----------------------------------|---|---|--------------------------------------|--|----------------------------------|--|
| Himachal Pradesh | Safe | 3 | 8.7 | 151 | 55 | 17 | 41.8 | <ul style="list-style-type: none"> • Medium - High Baseline water stress (BWS) • Per cattle water usage is high compared to other states. • Low water availability in winters • Wastewater generated is discharged in drains without prior treatment |
| Jharkhand | Safe: 92% Over-exploited: 2% Critical - 2% Semi-critical: 4% | 4 | 9.7 | 265 | 68 | 27 | 52.3 | <ul style="list-style-type: none"> • Low BWS • Per cattle water usage is highest among all the states. • Wastewater generated is discharged in drains with no prior treatment |
| Madhya Pradesh | Safe: 71% Over-exploited: 8% Critical - 2% Semi-critical: 19% | 9 | 15.1 | 155 | 18 | 10 | 27.9 | <ul style="list-style-type: none"> • Extremely high BWS • Per cattle water usage is lowest among all the states. • Wastewater generated is discharged in drains with no prior treatment |
| Uttarakhand | Safe: 79% Semi-critical: 22% | 2 | 8.8 | 119 | 61 | 14 | 36.3 | <ul style="list-style-type: none"> • Extremely high BWS • Per cattle water usage is high compared to three states. • Wastewater generated in milk unions is treated in ETP and used for gardening |
| Odisha | Safe: 95% Semi-critical: 3% Saline: 2% | 4 | 11.5 | 170 | 40 | 15 | 26.8 | <ul style="list-style-type: none"> • Low Baseline water stress • Per cattle water usage is high compared to four states. • Wastewater generated is discharged in drains with no prior treatment |

3.4 Milk Collection

3.4.1 Bulk milk collection centres (BMC) & Dairy Cooperative Society (DCS)

The milk collection centre is designed for farmers to transport their raw milk to be cooled in a bulk tank. Mostly water is withdrawn from an underground source.

Analysis of data collected for BMCs across all states shows:

- Water Source: Most states rely on groundwater as the major source. Himachal Pradesh, however, uses piped water supply as the source of water.
- Water Usage: Water use in BMCs is mainly for cleaning and washing purposes
- Water consumption: It varies depending on the BMC's milk collection capacity. It ranges from 150 to 3000 litres/day
- Wastewater Discharge: No treatment systems are installed for treating the wastewater. The wastewater is either being discharged in nearby drain or being spread in the fields where green fodder and vegetables were grown by the dairy farm.

Error! Reference source not found..2 highlights the observations regarding the water usage and discharge systems practiced by BMCs & DSCs in different states.

Table 1.9: Details on Bulk milk collection centres (BMC) & Dairy Cooperative Society (DCS)

| S.No. | Location | Milk Collection (litres) | Water Source | Water Consumption (litres/day) | Wastewater Management |
|-------------------------|---------------------------------------|---|--------------------|--------------------------------|--|
| Himachal Pradesh | | | | | |
| 1 | BMC - Indora Block, Kangra District | Capacity: 1500 litres/day, 800 litres/day is being collected. | Piped-water supply | ~1000 litres/day | After cleaning the water is drained through the nearby drains. |
| 2 | BMC - Chimbala, Kangra District | Capacity: 800 litres/day, 500 litres/day is being collected. It has one bulk milk cooling machine of 1000litres capacity | Piped-water supply | ~500 litres/day | After cleaning the water is drained through the nearby drains. |
| 3 | BMC - Karsog Block, Mandi District | Capacity: 9000 litres/day, 6100 litres/day is being collected. It has two bulk milk cooling machines of 5000litres capacity each. | Piped-water supply | ~4000 litres/day | After cleaning the water is drained through the nearby drains. |
| 4 | BMC - Kotli Block, Mandi District | Capacity: 9000 litres/day, 6100 litres/day is being collected. It has two bulk milk cooling machines of 5000 litres capacity each | Piped-water supply | ~3000 litres/day | After cleaning the water is drained through the nearby drains. |
| 5 | BMC - Haripur village, Kullu District | Capacity: 17000 litres/day, 10000 litres/day is being collected. It has 03 bulk milk cooling machine of 5000 litres capacity each. | Piped-water supply | ~3000 litres/day | After cleaning the water is drained through the nearby drains. |
| 6 | BMC - Kepu Block, Shimla District | Capacity: 25000 litres/day, 14000 litres/day is being collected. It has 04 bulk milk cooling machine of 5000litres x 2 & 500 litres x 2 capacity. It also has a milk chiller of 2000 litres capacity. | Piped-water supply | ~3000 litres/day | After cleaning the water is drained through the nearby land. |
| 7 | DCS - Dogri Village, Shimla | 250 litre/day is collected during flush seasons | Piped-water supply | ~150 litres/day | After cleaning the water is drained through the nearby land. |
| 8 | DCS - Bargal Village, Shimla District | 150 litre/day is collected during flush seasons. | Piped-water supply | ~150 litres/day | After cleaning the water is drained through the nearby land. |

| S.No. | Location | Milk Collection (litres) | Water Source | Water Consumption (litres/day) | Wastewater Management |
|-------|---|--|--------------------|--------------------------------|--|
| 9 | DCS - Dariyari Village, Indora Block, Kangra District | 150 lpd during lean seasons and upto 200 lpd during flush seasons. | Piped-water supply | ~15 litres/day | After cleaning the water is drained through the nearby land. |

Jharkhand

| | | | | | |
|---|--|---|--|------------------|--|
| 1 | BMC - Village – Marwaniya, Ramna, Garhwa, Jharkhand | Capacity: 4000 litres/day, 2700-2800 litres/day is being collected. | Borewell | ~1000 litres/day | The wastewater is being spread in the fields where green fodder and vegetables were grown by the dairy farm. |
| 2 | BMC - Balumath block office campus, Balumath, Latehar, Jharkhand | Capacity: 2000 litres/day, 1700-1800 litres/day is being collected | Piped water supply | ~1000 litres/day | The wastewater is being spread in the waste land beside the BMC. |
| 3 | BMC - Banhardi, Chandwa, Latehar, Jharkhand | Capacity: 2000 litres/day, 1300-1600 litres/day is being collected | Solar powered mini pipeline water supply service | ~1000 litres/day | The wastewater is being spread in the waste land beside the BMC. |
| 4 | BMC - Village – Manjhiaon, Garhwa, Jharkhand | Capacity: 4000 litres/day, 3100 litres/day milk is being collected | -no information- | -no information- | -no information- |

Madhya Pradesh

| | | | | | |
|---|--|---|----------------------------------|-----------------|------------------|
| 1 | BMC-based DCS - Barkheda Salam Village | Capacity: 2000 litres/day, 350 litres/day milk is being collected | Borewell | ~150 litres/day | -no information- |
| 2 | BMC - Phanda Kala Village | 1200 litres/day of milk are being collected | Borewell | ~150 litres/day | -no information- |
| 3 | BMC-based DCS - Panwadi Village | Capacity: 2000 litres/day, 350-400 litres/day milk is being collected | Borewell (Water Level- 400 feet) | No data | -no information- |

Uttarakhand

| S.No. | Location | Milk Collection (litres) | Water Source | Water Consumption (litres/day) | Wastewater Management |
|---|-------------------------------|---|------------------------|--------------------------------|---|
| It was observed that there were no BMCs in Uttarakhand. However, Milk Unions collect milk from DCS. | | | | | |
| 1 | DCS - Kheda Jat Village | The capacity of DCS is max to 300 litres. | handpump/boring | ~200 lt/day | Drainage of Wastewater generated from cleaning in common Naali. |
| Odisha | | | | | |
| 1 | DCS and BMC -Jharpada Village | Capacity: 2000 litres/day | Tubewell (130ft depth) | ~1000 litres/day | The wastewater is released in a pit through a drain |
| 2 | DCS and BMC - Bhagalpur | Capacity: 600 litres/day | Tubewell | ~50 litres/day | Wastewater is drained outside. |

3.4.2 Chilling Plants

If the dairy plant is far away from the collection centre, then the collected milk is first brought to a centralized chilling centre/ bulk milk cooling unit. Here, milk is cooled to 4°C and stored in insulated storage tanks of 5000-20,000 L capacity. Subsequently, the chilled milk is transported in insulated Road milk tanker to the dairy plant. The transportation of milk from the chilling centre to the dairy plant usually takes place once a day.

For most chilling plants, it has been reported that water treatment plants have been installed. It was observed that utilization of reject water from the WTP is not being done. Further, no wastewater treatment/recycling is being done.

Analysis of data collected for chilling plants across all states shows:

- Water Source: Most states rely on groundwater as the major source. Himachal Pradesh, however, uses piped water supply as the source of water.
- Water Usage: Water is used for washing and cleaning of Milk Tankers, Milk trays and Milk Cans.
- Water consumption: It varies depending on the BMC's milk collection capacity. It ranges from 150 to 200,000 litres/day
- Wastewater Discharge: No treatment systems are installed for treating the wastewater. The wastewater is either being discharged in nearby drain.

Error! Reference source not found. highlights the observations regarding the water usage and discharge systems practiced by chilling plants in different states.

Table 1.10: Water usage and discharge systems practiced by chilling plants in the five states

| S.No. | Location | Milk Collection Capacity (litres) | Water Source | Water Consumption (litres/day) | Wastewater Management |
|---|---|---|--------------------|--------------------------------|---|
| <i>Himachal Pradesh</i> | | | | | |
| 1 | Chilling Centre & BMC - Kepu Block, Shimla District | Capacity: 25000 litres/day, 14000 litres/day is being collected. It has 04 bulk milk cooling machine of 5000litres x 2 & 500 litres x 2 capacity. It also has a milk chiller of 2000 litres capacity. | Piped-water supply | ~3000 litres/day | After cleaning the water is drained through the nearby land. |
| <i>Jharkhand</i> | | | | | |
| It was noted that there is no information regarding chilling plants in Jharkhand. | | | | | |
| <i>Madhya Pradesh</i> | | | | | |
| 1 | Chilling Centre, Agar Malwa | Capacity: 30,000 litres/day, running capacity is around 11,000 to 11500 litres/day. | Tube well | ~1500 litres/day | Wastewater is used for gardening |
| <i>Uttarakhand</i> | | | | | |
| 1 | Block Gadarpur, Rudrapur District | Capacity: 20,000 litres/day. Milk Collection in the morning approx. 5500 litre and in the evening 3000 litre approx. | Tube well | ~2,00,000 litres/day | Wastewater Drainage system of the plant has been connected to a common naali. ETP is not in active stage. |
| 2 | Rudrapur district Chilling Plant | Capacity: 10,000 litres/day. They are collecting approx. 4000 lit in morning, approx. 2000 litre in evening from nearby DCS. | Tube well | ~2000 litres/day | Drainage system of wastewater connected from common naali including whole plant. |
| 3 | Herbertpur, Vikas Nagar, Dehradun Chilling Plant | Milk Collection in the morning approx. 1650 litre per day. | -no information- | ~2000 litres/day | Drainage of wastewater is done in Pit |
| <i>Odisha</i> | | | | | |

| S.No. | Location | Milk Collection Capacity (litres) | Water Source | Water Consumption (litres/day) | Wastewater Management |
|-------|--|---|--|--------------------------------|---|
| 1 | Adaspur Milk Chilling Center (AMCC), Cuttack, Odisha | Chilling capacity is 30,000 litres/day, handles 18,000 litres/day of milk | Borewell (50ft. Depth), The are two rivers near the facility, Prachi river (100 meters) and Devi river, which are attributed to the high water levels in the region | 7-8,000 litres/day | The wastewater generated in discharged in a drain which opens in a pit in the premises. |
| 2 | Tirtol Milk Chilling Center, Cuttak | Chilling capacity is 30,000 litres, Storage Tank capacity is 60,000 litres.Tirtol gets milk from 14 BMCs. There is a 20,000 litres capacity ATP present at the facility | Tubewell (depth ~200ft). | ~12000 litres/day | |

3.4.3 Milk Union & Dairy Plants

Water used in a dairy processing establishment can be broadly classified into the following major categories³⁷:

- Process water: Water used for direct preparation of products, cleaning purposes and various technical purposes. Examples are washing / cleaning of equipment, transport of product, dissolution of ingredients, water remaining in the final product etc. A characteristic of process water is that it comes into contact with product directly or indirectly. Therefore, process water should meet drinking water quality.
- Cooling water: Cooling water is the water used for removal of heat from process streams and products. The quality requirements for cooling water used in plate heat exchangers to cool milk is critical, since with this type of equipment there is a risk of failure and leakage of cooling water to product. In such situations cooling water should be of drinking water quality.
- Boiler feed water: Boiler fed water is required for steam production. The main quality requirements are low hardness and low air and carbon dioxide content.
- Miscellaneous: Other uses of water in a dairy plant are for ancillary purposes such as amenities and gardens, and extraordinary incidents (e.g., fire protection).

For most milk unions, it has been observed that

- Water Source: piped-water supply or tube wells/borewells
- Water Consumption: It depends on the capacity of milk handled. It ranges from 16 to 200 kilolitres/day
- Wastewater Discharge: Effluent treatment plant (ETP) has been installed for most of the unions. The treated water is being used for gardening and farming purpose.

Error! Reference source not found.**Error! Reference source not found.** highlights the observations regarding the water usage and discharge systems practiced by Milk Unions & Processing Plants in the five states.

³⁷ <https://www.dairyknowledge.in/content/management-water-dairy-plants>

Table 1.11: Water usage and discharge systems practiced by Milk Unions & Processing Plants in the five states

| S.No. | Location | Milk Collection Capacity (litres) | Water Source | Water Consumption (litres/day) | Wastewater Management |
|-------------------------|---|---|--------------|--------------------------------|--|
| Himachal Pradesh | | | | | |
| 1 | Dairy Plant - Dhagwar, Kangra Block, Kangra District | Processing Capacity 20,000 litres/day. It currently processes around 6,000 litres/day. | Borewell | ~15 kilolitres/day | 10,000 litres/day is treated in Effluent Treatment Plant and treated water is drained into the nearby Manjhikhad (nala). |
| 2 | Dairy Plant - Chakkar, Balh Block, Mandi District | Processing Capacity 70,000 litres/day. It currently processes around 30,000 litres/day. | Borewell | ~30 kilolitres/day | 20,000 litres/day is treated in Effluent Treatment Plant and drained into the nearby agricultural lands which are around 2 – 3 km from the plant boundary. |
| 3 | Dairy Plant - Duttanagar, Rampur Block, Shimla District | Processing Capacity: 65,000 litres/day | Borewell | ~200 kilolitres/day | 1.75 lakhs litres/day is treated in Effluent Treatment Plant and drained into River Sutlej which is around 800 metres from the plant boundary. |
| Madhya Pradesh | | | | | |
| 1 | Bhopal Milk Plant | Capacity: 400 kilolitres/day | Groundwater | ~600 kilolitres/day | 405 kilolitres/day is treated in an Effluent Treatment Plant of capacity 602 kilolitres/day. The treated is being used for gardening and land landscaping and ~200 kilolitres/day treated water is being sent to a nearby railway station for wagon washing. |
| Jharkhand | | | | | |
| 1 | Milk Processing Plant, Latehar, Jharkhand | Processed Milk Production – 8,000 – 10,000 litres/day. It collects 32,000 litres/day of milk. | Borewells | ~16 kilolitres /day | Wastewater generated from Cleaning, milk spillage, washing and processing is discharged into the adjacent stream (nala) without any treatment. |

| S.No. | Location | Milk Collection Capacity (litres) | Water Source | Water Consumption (litres/day) | Wastewater Management |
|--------------------|--|--|------------------|--------------------------------|---|
| Uttarakhand | | | | | |
| 1 | Location: Udham Singh Nagar Dugdh Utpadak Sahakari Sangh Ltd. Milk Union | Capacity: 24000 litres/day | Tube well | ~2000 kilolitres/day | Effluent Treatment Plant capacity is 15 kilolitres/day. The treated water is being used for gardening and fish farming purpose. |
| 2 | Haridwar Milk Union | Processing Capacity: 30000 litres/day | Tube well | ~600 kilolitres/day | Effluent Treatment Plant capacity is 50 kilolitres/day. The treated is being used for gardening and land landscaping. |
| 3 | Dehradun Milk Union | Capacity: 18000 litres/day | -no information- | -no information- | Effluent Treatment Plant capacity is 20 kilolitres/day. The treated is being used for gardening and land landscaping. |
| Odisha | | | | | |
| 1 | Cuttack Milk Union | No water use specified. Products are produced by the Tirtol Milk Chilling Center are: Sweet curd, Plain curd, Whole milk curd, Paneer, Ghee, Butter milk in summers | | | |

3.5 Fodder Cultivation

Estimates of fodder cultivation and production in the country vary widely. Dairy animals are normally fed with fodder available from cultivated areas, supplemented to a small extent by harvested grasses and top feeds. There are three (3) major sources of fodder supply that includes:

- Crop residues;
- Cultivated fodder; and
- Fodder from common property resources like forests, permanent pastures and grazing lands.

In animal feed supply, coarse cereals have a major role and four major cereals, viz. maize, barley, sorghum and pearl millet are specifically important. Production of these cereals is stagnating at around 30 million tonnes in India. More importantly, most of the coarse cereals in the developed countries are mainly used for cattle feed and some of the cereals like barley are used in breweries. However, in India their use is mainly for direct consumption mostly by poor in the villages due to human population pressure.

The overgrazing and continuous degradation of grazing lands along with loss of fertility is further decreasing their productivity. The problems of grazing lands are related to ecological and socio-economic causes. In arid areas, water is the limiting factor, in semi-arid areas, proper land utilization and excessive grazing are the main problems and in high rainfall zones, it is the lower nutritive value of the herbage

- Most states use tube well for irrigation and follow the usual flood irrigation practices.
- Primary hurdle in the fodder production is the lack of irrigation facility and awareness among the farmers.
- The green fodder (normal grass) is available in the rainy season only. In rest of the year due to lack of irrigation facility farmers are unable to grow the fodder for their cattle.

4. EFFICIENCY IMPROVEMENT MEASURES/MITIGATION PLAN

Water management includes the efficient use of this natural resource and preventing or reducing water pollution. Water management techniques such as the following may be implemented

- Provide water in sufficient amounts and good quality
- Implement a water management system
- Apply a methodology for reducing water consumption
- Eliminate the use of water wherever possible
- Promote rainwater harvesting

Water pollution control can be achieved by:

- Reducing the volume of wastewater generated
- Eliminating or decreasing the concentration of certain pollutants
- Wastewater treatment
- Recycling or re-use water
- Or a combination of these measures.

4.1 Households (Involved in Animal rearing)

Households, Dairies and gaushalas should take necessary steps for the judicious usage of water for drinking & bathing of cattle and other services including floor cleaning. Drinking does not cause water depletion. More than 80% of milk is water. So, there must be provision of sufficient quality drinking water to dairy cows. Water is best utilized in a farm if both entry and exit can be handled efficiently in a farm.

Further, dairies should ensure that the wastewater does not percolate through ground and pollutes the groundwater.

The disposal of cow/buffalo dung is the biggest challenge in dairy farms and gaushalas. However, cattle dung, if effectively utilised, can be a resource of manure & energy. The cattle dung contains many beneficial constituents which may be used as fuel source either by direct combustion (dung wood) or converted to biogas, soil conditioner, fertilizers, material for wall plastering, construction of granaries, livestock & fish feeding, etc.

Table 1.12: Water Conservation Measures for Households (for Animal Rearing)

| Focus Area | Recommendations | |
|---|--|--|
| | Short Term | Long Term |
| <ul style="list-style-type: none"> ■ Dairy animal's drinking water intake, ■ Animal washing, ■ Cattle shed cleaning & washing, | Install a float with a shut-off in tubs or tanks. A water tub that is accidentally left to run over while filling with a hose is responsible for the loss of water. | Provide drinking water in individual watering trough rather than providing water from community water resources like ponds and canals |
| | Implement good housekeeping by monitoring for water leaks and faults and repairing them promptly. A leaking pipe joint or dripping faucet contributes to the loss of huge quantities of water which often go undetected. | Promote the collection and use of roof water for use |
| | Use of sprinkler for bathing instead of bucket and pipe system | A common storage pit for 4-5 households in the same area could help in efficient storage and reuse of wastewater. |
| | Use the leftover drinking water for cleaning of shed | The flooring of the shed should be properly paved (impervious) with a wastewater collection system to avoid wastewater percolation into the ground. However, the floor should not be slippery to ensure safety of animals. |
| | Water used for bathing activity should be collected in pit, allowed to settle, and thereafter used for floor cleaning activities. | To harvest wastewater, flooring should be equipped with water retention system |
| | Use the shed cleaning water for preparation of manure | Metering water use on farms can be effective in managing water use |

4.2 Milk Collection & Processing

Dairy plants use substantial volumes of water for cleaning, cooling towers, boilers, and other processes. Water is used as an energy carrier for heating and cooling, as a material for cleaning, and as a transporter of chemicals and nutrients; therefore, withdrawing and distributing water and treating the resulting wastewater represent a significant cost. Improving water use efficiency is therefore critical for dairy processing.

Milk processes and dairy products (integrated project) industry are categorized in Red category at large scale and in Orange category in small scale and need to obtain CTE/ CTO from respective State Pollution Control Boards under Air and Water Act.

All states rely on groundwater as one of the major sources of water. Thus, it is important to have necessary approval for withdrawal of ground water from CGWB/ State ground water board; and implement the mitigation measures suggested in the withdrawal NOC. As per the CGWA Guidelines dated 24 September 2020 Ground water extraction in NDSP-II Project States (except Himachal Pradesh) is being regulated by CGWA and NOC for ground water withdrawal shall not be issued in Over-Exploited areas. In Safe, Semi-Critical & Critical areas NOC for ground water withdrawal is mandatory subject to water audit if abstracting ground water more than 100 m³/day. Respective State Governments are responsible for maintain and update the drilling database to CGWA portal.

To save water and minimize water pollution from cleaning, the following techniques can be applied:

4.2 Fodder Cultivation

The water conservation measures for fodder cultivation is presented in Table 4.3.

Table 1.13: Water Conservation Measures for Milk Collection & Processing Units

| Focus Area | Recommendations | |
|-------------------------------|---|---|
| | Short Term | Long Term |
| Cleaning & washing | <ul style="list-style-type: none"> ▪ Install trigger nozzles on hoses to reduce flow rates in manual cleaning systems ▪ Utilize spray guns/high-pressure jet instead of open-ended hoses for cleaning ▪ Optimize the water pressure at jets, nozzles and orifice. ▪ Re-use water from the final rinse for pre-rinsing ▪ Remove as much residual material as possible from vessels and equipment before they are washed ▪ Avoid using water hoses as brooms. ▪ Pre-soak floors and equipment to loosen dirt before final clean ▪ Ensure that drains are equipped with catchpots ▪ Ensure that the catchpots are in place during cleaning ▪ Rinse small equipment in a sink or bucket, rather than with running water | <ul style="list-style-type: none"> ▪ Utilize an automatic water supply shut off on trigger operated spray guns or hoses. ▪ Adopt Cleaning-in-place (CIP) rather than manual cleaning where possible <ul style="list-style-type: none"> • Optimize the CIP sequences, i.e. cleaning and rinsing times • Optimize the CIP programme for the size of plant/vessel and type of soiling • Calibrate CIP programme • Recover CIP solutions ▪ Apply automatic dosing of chemicals at the correct concentrations ▪ Utilize closed circuit cooling systems instead of once-through cooling, this eliminates most of the water waste in cooling ▪ Optimize existing processes to reduce water usage ▪ Implement an efficient program of maintenance of utility systems. ▪ Capture the pre-cooler water that chills down milk. Allowing it to run down the drain can waste water every minute. ▪ Implement water stewardship programs |
| Processing | <ul style="list-style-type: none"> ▪ Recirculate homogenizer and pump sealing water | <ul style="list-style-type: none"> ▪ Optimize processing schedule. Use continuous rather than batch processes to reduce the frequency of cleaning |
| Wastewater Management | <ul style="list-style-type: none"> ▪ Collect steam wastewater (generated during pasteurization period) in specified tanks. The collected water can be used for quick steaming purpose. This will also help in reducing GHG emission. ▪ Re-use secondary water, such as reverse osmosis water and product condensate, for cleaning less sensitive areas where feasible | <ul style="list-style-type: none"> ▪ Collect wastewater generated through CIPs and treat it in a dedicated treatment unit. Recycle the treated water in utility (cooling towers/boilers), toilet flushing, washing or irrigation for green fodder cultivation area. ▪ In case the processing units are in the same area, effluent from these units can be treated in a common effluent treatment plant. ▪ Treat the domestic wastewater through STP/ septic tank & soak pit. |

| Focus Area | Recommendations | |
|---|--|---|
| | Short Term | Long Term |
| Water Use in Utilities (Boilers, Cooling Towers) | <ul style="list-style-type: none"> ▪ Operate boilers efficiently ▪ Collect condensate for reuse ▪ Maintain cooling towers in proper working condition | <ul style="list-style-type: none"> ▪ Remove scales from cooling towers & prevent excess water loss from drift. |
| Alternate Source of Water | <ul style="list-style-type: none"> ▪ Harvest rooftop rainwater in small tanks through pipes each building. | <ul style="list-style-type: none"> ▪ Create a storage structure of adequate capacity to collect rooftop as well as run-off water from the plant area ▪ Use harvested rainwater process as an alternate source of water. ▪ Harvested rainwater may also be used to recharge the ground (to be done in line with the guidelines of CGWA) |
| Monitoring & Review | <ul style="list-style-type: none"> ▪ Implement good housekeeping by monitoring for water leaks and faults and repairing them promptly. ▪ Install adequate water metering facilities at each of the points of entry of water into the dairy plant (borewells, piped water supply, etc.), and meters on the supply to individual departments or equipment with major usage of water. ▪ Install piezometers to check the groundwater levels ▪ Monitor water consumption on high-use equipment and treated water | <ul style="list-style-type: none"> ▪ Form a dedicated team to review and analyse the data collected. ▪ Periodically review the water consumption data and identify potential issues/reason for variation. |
| Training & Awareness | <ul style="list-style-type: none"> ▪ Provide Awareness and training program for water conservation and wastewater recovery | <ul style="list-style-type: none"> ▪ Training and awareness programs on ETP handling for workers. ▪ Training an awareness program for milk suppliers |

Table 1.14: Water Conservation Measures for Fodder cultivation

| Focus Area | Recommendations | |
|------------|---|---|
| | Short Term | Long Term |
| Irrigation | Production of hydroponic green fodder with less water requirement can also be adopted by farmers. | Providing producers with the tools to assess their water consumption and to learn cost/benefit ratio of fine-tuning their water use, could improve profitability, extend manure storage capacity, and conserve a precious resource. |
| | Perennial grasses (bajra, hybrid napier) can provide green fodder throughout the year. | Awareness programs for farmers regarding green plant species needs very low irrigation (sorghum, oats etc.) Ensuring the availability of fodder round the year - |

APPENDIX K: TRAFFIC MANAGEMENT STRATEGY

1. INTRODUCTION

1.1 Traffic Management Context

The complete dairy supply chain relies on transportation activities. Journey of milk from a household (producer) to another household (consumer) through the milk processing plant, Milk Pooling Points (MPP) and Bulk Milk Coolers (BMC) involves multiple types and scale of transportation based on the specific need. Transportation activities involved in Dairy Supply Chain require traffic management majorly where the milk producers or the cold chain facility (BMC) is located at far flung area or a densely populated area or along a proposed route i.e., along a road stretch where there is existing movement of town/ city traffic.

1.2 Objectives

The environment is impacted at every step of the dairy supply chain, including production, processing, packaging, shipping, storage, distribution, and marketing.

Main objectives of this Traffic Management Procedure (TMP) are:

- To identify activities which necessitates management of traffic movement and transportation;
- To assess the anticipated traffic impacts;
- To recommend necessary mitigation and management measures to address any risks or impacts that may arise due to improper traffic management; and
- To provide guidelines for monitoring and reviewing the implementation of the action plan.

1.3 Regulatory Framework and Safeguards

Relevant provisions under the following regulations, guidelines and pertinent standards are applicable towards the implementation of this TMP.

Table 1-1: Applicable Regulation & Guidelines

| Law | Description |
|--------------------------------------|--|
| Motor Vehicle Act 1988, amended 2019 | Motor Vehicle Act regulates the traffic on the roads and is applicable to whole India. This act guides us about the vehicle registrations, issuance of driving licence and penalties for traffic offences. Traffic rules laid out in these regulations are to be strictly followed for road safety and better implementation of traffic management. Noise due to increased traffic must be controlled and noise levels are to be maintained as per these applicable rules. |
| WBG General EHS Guidelines | Traffic generated due to the Project directly or indirectly have impact on health and safety of workers and community. Section 2.3 provides guidelines on industrial vehicle driving and site traffic and Section-3.4 discuss on traffic safety which are applicable to the traffic management plan. |

2. POTENTIAL IMPACTS

2.1 Potential Impact on Environment

Inefficient traffic management may result in running of engine for a long period to complete the route which may result in more air and noise emissions contributing towards air and noise pollution.

2.2 Potential Impact on Various Stakeholders

In the dairy supply chain Project, following key impacts are anticipated -

- Milk Producers - Increased backlog stocks of milk at MPPs and BMCs due to inefficient traffic management;
- Population living near the processing plant or BMC - Increase in localized traffic will have impact on air quality and noise levels in the locality;
- Customers/ Distributors - Non-compliance with scheduled delivery to the customer/ distributor;

2.3 Potential Impact on Business Operations

Greater number of impacts are anticipated to the dairy supply chain itself because the raw milk has very short shelf life and it is very necessary to collect the raw milk from producers and deliver it to a processing plant within a limited time frame unless the milk can spoil. Post processing of milk increase the shelf life in form of products. Few traffic impact on dairy business operations are:

- Cost increase due to incorrect traffic planning
- Spoilage of milk and milk products during transport;
- Damage to the milk packaging during transportation;
- Non-compliance with milk storage temperature during the transportation;
- Milk van accident;

3. MANAGEMENT PLANS

The POIs, Dairy plant and the dairy outlets must apply prevention and control measures to control hazards which are identified and assessed as posing a threat to the employees and community, and where practicable, the hazard shall be eliminated. The following preventive and protective measures must be implemented order of priority:

Table 1-2: Identified Traffic Hazards

| Sl. No. | Sub-component reference and proposed activity | Stages | Description of Hazard | Control Method |
|---------|---|--------------|--|--|
| 1. | B.1 - Strengthening village level milk chilling infrastructures | Construction | <ul style="list-style-type: none"> Supply of construction materials. | <ul style="list-style-type: none"> Contractor should ensure supply of materials in night time only. |
| | | Operation | <ul style="list-style-type: none"> Traffic congestion at MPPs and BMCs due to vehicle of individual farmers, from milk pooling points (MPPs) and community milking centres visit BMC with milk collected from the farmers. Also, milk tankers from dairy plants will visit the BMC daily for milk collection. Accident in milk supply chain transportation | <ul style="list-style-type: none"> Schedule visit of different types of vehicles to avoid traffic congestion. Federation owned or hired vehicle drivers shall ensure training on defensive driving to minimise accidents and injury. |
| 2. | B.1 - Community Milking Centres | Construction | <ul style="list-style-type: none"> Refer Sl. No. 1. | <ul style="list-style-type: none"> Refer Sl. No. 1. |
| | | Operation | <ul style="list-style-type: none"> During operation community milking centres will house several cattle that may cause accident with milk collection vehicle if not tied properly at designated place. | <ul style="list-style-type: none"> The community milking centre in charge should ensure that no cattle should walk in the roads and tied properly at designated area to avoid any accident with milk collection vehicle. |
| 3. | B.1 - Village level Milk Pasteurization and Product Manufacturing | Construction | <ul style="list-style-type: none"> Refer Sl. No. 1. | <ul style="list-style-type: none"> Refer Sl. No. 1. |
| | | Operation | <ul style="list-style-type: none"> Refer Sl. No. 1. | <ul style="list-style-type: none"> Refer Sl. No. 1. |
| 4. | B.2 - Installation of milk and milk products booths/ parlours/ kiosks | Construction | <ul style="list-style-type: none"> Refer Sl. No. 1. | <ul style="list-style-type: none"> Refer Sl. No. 1. |
| | | Operation | <ul style="list-style-type: none"> Milk or milk product booth or kiosks are generally located in commercial areas near shopping centres, schools, colleges hospitals etc. The vehicle approaching to the kiosk for supply of material will be of large quantity and may interrupt the normal traffic of the road. | <ul style="list-style-type: none"> Products should be delivered in off-peak hours to avoid any traffic congestion in the road. |
| 5. | B.3 - Dairy Plant Improvement | Construction | <ul style="list-style-type: none"> Refer Sl. No. 1. | <ul style="list-style-type: none"> Refer Sl. No. 1. |
| | | Operation | <ul style="list-style-type: none"> Heavy vehicles visit the milk processing plant with raw materials, packaging materials etc. | <ul style="list-style-type: none"> A traffic management plan should be prepared to manage the entry and exit of vehicle in the milk processing plant. |

| Sl. No. | Sub-component reference and proposed activity | Stages | Description of Hazard | Control Method |
|---------|---|--------------|--|--|
| 6. | C.1 - Calf Rearing Centre | Construction | ■ Refer Sl. No. 1. | ■ Refer Sl. No. 1. |
| | | Operation | ■ Supply of raw food materials for calf rearing will be done by trucks | ■ Traffic signs and barricades should be installed in the calf rearing centre to avoid accident of any calf. |
| 7. | C.2 - Setting up of Fodder Seed Processing Plant | Construction | ■ Refer Sl. No. 1. | ■ Refer Sl. No. 1. |
| | | Operation | ■ Supply of raw materials will be done by trucks and tractors | ■ Traffic signs and barricades should be installed in the fodder seed processing plant to avoid accident |
| 8. | C.3 - Pilot on control of Bovine Mastitis | Construction | ■ Refer Sl. No. 1. | ■ Refer Sl. No. 1. |
| | | Operation | ■ Supply of raw materials (medicines) will be done by small vans. Cattle may brought here using vehicles in case of any emergency. | ■ Traffic signs and barricades should be installed in the animal dispensary to avoid accident |
| 9. | C.4 - Establishing Gobar gas Clusters and slurry processing centres | Construction | ■ Refer Sl. No. 1. | ■ Refer Sl. No. 1. |
| | | Operation | ■ Supply of raw materials (cow dung) will be done by trucks and tractors | ■ Traffic signs and barricades should be installed in the gobar gas to avoid accident |
| 10. | C.5 - Pilot on Rooftop Solar PV System at DCS/MMP | Construction | ■ Refer Sl. No. 1. | ■ Refer Sl. No. 1. |

4. IMPLEMENTATION ARRANGEMENTS

4.1 Roles and Responsibilities

The PMU-NDDDB will be responsible for the operationalization and overall implementation of this TMP. PMU-NDDDB will have a dedicated Environment and Social (E&S) Cell, who will act as Nodal Officer for implementation of E&S management system. E&S Cell will seek TMP implementation update on predefined KPIs from POIs of respective states in the monthly, quarterly and annual project implementation update report.

Table 1-3 Roles and Responsibilities for SEP Implementation

| S. No | Entity | Responsibility in SEP implementation |
|-------|--|---|
| 1 | E&S Cell, NDDDB | <ul style="list-style-type: none"> ■ Nodal agency for implementing E&S action plan including TMP implementation; ■ Updating TMP on regular basis based on feedback received from line agencies like CPSC, PFC, SLTMC, POIs ■ Supervision of TMP implementation by POIs |
| 2 | State Level Technical Management Committee (SLTMC) | <ul style="list-style-type: none"> ■ Monitor TMP implementation by respective POIs of the state; ■ Provide feedback to NDDDB on TMP related matters, including periodic data on implementation |
| 3 | State Federation | <ul style="list-style-type: none"> ■ Monitor TMP implementation by respective POIs of the state; ■ Provide feedback to NDDDB on TMP related matters. |
| 4 | Other POIs (Milk Union, Milk Producer Companies, FPO etc.) | <ul style="list-style-type: none"> ■ Implement actions as proposed in TMP with the guidance from NDDDB; ■ Maintain records of monitoring at their offices. |

4.2 Training on TMP implementation

Sufficient training needs to be provided to all personnel. The scope of the training will ensure that workers are able to fulfil their roles in efficient traffic management and functions through awareness on relevant aspects of this plan, related legislation and standards and general traffic management practices (defensive driving, maintaining prescribed speed limit, etc.). Training details (e.g. participants, subjects, training hours provided, etc.) will be recorded.

4.3 Monitoring and Reporting

Performance of POIs on TMP implementation will be assessed based on following monitoring and reporting activities.

- Periodical site inspection and visual observation;
- Monthly inspection report to State Federation.

5. SAFE OPERATING PROCEDURE

Safe Operating procedure is the document for operational control. It is prepared for each activity by collating the existing control measures & the additional control measures identified during the Risk Assessment. Traffic management is to be monitored on daily basis to evenly spread traffic flow during

a day to avoid congestion and minimise chances of road accidents. Management actions required for various aspects are presented in the subsequent sections.

5.1 Traffic Management

5.1.1 Access Roads to the Dairy facilities

There are various facilities included in the dairy supply chain e.g., MPPs, BMCs, milk processing plant, milk outlet/ kiosks, fodder processing unit, gobar-gas unit, community milking centre etc. The entire dairy supply chain covers a long stretch of road daily for the collection of raw milk and distribution of milk and milk products. The respective dairy facility will be responsible for monitoring the condition of access roads used by vehicle entry and exit and in case of any damage bring it to the knowledge of the road maintenance authorities. The traffic /logistics management team will review the condition of access road on regular basis as per checklist given in **Annexure-I** of this action plan.

5.1.2 Vehicle Management and Maintenance

To ensure that accident rates and the overall transport fuel consumption are minimised, vehicle fleet working on the project (whether owned or rented by milk federation or its subcontractors) is to be maintained according to the manufacturers' specifications. This shall include the compliance of all vehicles with all safety related specifications, as well as mechanically maintaining vehicles to manufacturer specifications to minimise fuel consumption as well ensure safety on road.

Respective milk federation will ensure the following in respect of vehicle maintenance, noise, and emission standards:

- All vehicles to be maintained so that their noise and emissions do not cause nuisance to local people;
- An up-to-date database of all vehicles deployed across the dairy supply chain to be maintained. The database to contain details about the periodical maintenance, schedule of maintenance, vehicular emission and noise emission testing done as per regulatory requirement;
- Routes to be selected so as to minimise nuisance to local residents from noise and emissions;
- Avoidance of passage through and near settled areas during night time hours;
- Oil and fuel leaks to be addressed within 24 hrs of observation or reporting on any vehicle;
- Vehicle maintenance and management parameters will form a critical component of key performance indicator for the contractor responsible to maintain their vehicles; and
- All heavy vehicles like milk tankers, cranes, battery operated trolleys etc. to be provided with reversing siren.

5.1.3 Parking

Parking of vehicles shall be prohibited on community roads. A dedicated parking area will be provided near the respective dairy facility area and other suitable location for the vehicles to be used at site. All the vehicles used in the project should be parked in the dedicated parking areas and the parking areas should be provided clear signages. The parking of vehicles engaged in milk collection and distribution on footways, along single lane roads and double parking shall be prohibited.

The vehicle maintenance procedures will address the oil and fuel spills due to leakage etc. Oil and fuel spill during parking or whenever the vehicle is idling will be addressed by providing oil and fuel adsorbent materials or drip trays in the parking area in the hard stand areas. Vehicles will not be allowed to park anywhere else outside the hard standing area.

5.1.4 Community Liaison and Community Safety

Traffic safety in local communities will be a high priority for respective milk federation and their contractors. The contractor will ensure communities are advised in advance about project progress and near-term activities where transport issues have the potential to impact local communities. The Project Stakeholder Engagement Plan will be utilised to communicate with the communities in this regard. The communications to the community will discuss the timing of traffic and transportation activities.

5.1.5 Mitigation Measures

The contractor will minimize the use of road transport wherever possible by efficient transport planning.:

- Ensure daily management of milk collection vehicles. Also, to ensure that vehicles follow all traffic rules;
- Ensure additional road safety measures are adopted at sensitive locations and black spots;
- Vehicle movement and parking within the premises shall be managed properly to avoid accidents;
- Necessary training to the driver of construction vehicles for speed restrictions'
- Arrangements and routes for abnormal loads to be agreed in advance with the police, emergency services and the roads authority;
- Appropriate speed limits for various motor vehicles to be determined as part of the traffic management based on type of roads available; and
- In addition, the contractor will comply with all statutory vehicle limits with respect to width, height, weight, loading, etc.
- Ensure hazardous and other wastes generated from transportation fleet (maintained for supply of milk products to consumer markets) maintenance workshops are managed as per the requirements given in the Wastes management Plan.

ANNEXURE 1: CHECKLIST FOR ACCESS ROUTE MAINTENANCE

| S. No. | Aspects | Yes/ No | Remarks |
|--------|---|--|---------|
| 1 | Are routes clearly separated from pedestrian routes by fencing and/or a kerb, or other suitable means | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 2 | Are routes wide enough to safely accommodate the number of vehicles likely to use them at peak times? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 3 | Do routes allow easy access to delivery areas | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 4 | Are routes kept free of obstructions | <input checked="" type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 5 | Are routes clearly and suitably signed | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 6 | Can pedestrians safely cross the main vehicle route? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 7 | Do pedestrians have a clear view of traffic movements at crossings and at gates which lead onto traffic routes? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 8 | Do routes eliminate or reduce the need for reversing? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 9 | At the final point of exit can the driver see pedestrians on the pavement? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 10 | Are temporary structures protected from vehicle impact? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| 11 | Are hazardous and other wastes generated from fleet maintenance workshops are maintained as per the requirements given in the Wastes Management Plan? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |

ANNEXURE 2: DRIVERS SAFE PRACTICE CHECKLIST

| S. No. | Safe Practice | Remarks |
|--------|--|---------|
| 1 | Only operate vehicles if you are competent and authorised to drive them | |
| 2 | Do not drive when your abilities are impaired by ill health, poor vision, prescribed/illegal drugs, or alcohol | |
| 3 | Make sure you fully understand the operating procedures of the vehicles you control | |
| 4 | Know the site routes and follow them. Take care at pedestrian crossovers | |
| 5 | Understand the system of signals used on site | |
| 6 | Visiting drivers: seek appropriate authority to enter the site and operate vehicles | |

| | | |
|----|---|--|
| 7 | Know the safe operating limitations of your vehicles, particularly relating to safe maximum loads and gradients | |
| 8 | Carry out daily checks on your vehicles and report all defects immediately to supervisors | |
| 9 | Follow site procedures and comply with all site rules | |
| 10 | Do not drive at excessive speeds | |
| 11 | Wear appropriate PPE when out of the vehicle | |
| 12 | Ensure that windows and mirrors are kept clean and clear | |
| 13 | Keep the vehicle tidy and free from items which may hinder the operation of vehicle controls | |
| 14 | Do not allow passengers to ride on vehicles unless safe seating is provided | |
| 15 | Park vehicles on flat ground wherever possible, with the engine switched off, the handbrake applied | |
| 16 | Do not reverse without reversing aid or banksman assistance | |
| 17 | Do not remain on vehicles during loading operations, unless the driver's position is adequately protected | |
| 18 | Ensure loads are safe to transport | |
| 19 | Do not attempt to get on or off moving vehicles | |
| 20 | Do not adjust with the engine running and guards removed | |
| 21 | Do not smoke during refuelling operations | |
| 22 | Do not use a mobile phone whilst driving on site | |
| | Sign Below | |
| | Drivers Name | |
| | Drivers Signature | |

ANNEXURE 3: CHECKLIST FOR DAILY/ WEEKLY TRAFFIC MANAGEMENT

| Traffic management plan | | |
|--|---|---------|
| Name of the location – | | |
| Latitude: | | |
| Longitude: | | |
| Date: | | |
| Aspects | Details | Remarks |
| Plan for vehicle movement with timings | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| Number of vehicles for the activity | | |
| List of type of vehicles and number of each type | | |

| | | |
|--|---|--|
| Is width of the road adequate for proposed vehicle movement to the site | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| Sensitive locations along the route of transportation | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| Are alternate routes planned for regular traffic diversion due to construction activities along the road | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| Safety barricades, signages along excavated road stretches and diversions | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| Vehicle PUC check (for all vehicles) mention if any of the vehicle does not have PUC done | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | |
| Dedicated parking areas – locations | | |
| Alternate public transportation routes due to Project activities | | |
| Incidents/ near misses | | |
| Driver license check | | |

ANNEXURE 4: RECORD KEEPING AND DOCUMENTATION

| Documentation | Record keeping (Yes/ No) | Evidence/ Document reference and date | Remarks |
|---|--|---------------------------------------|---------|
| Monitoring Checklists | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Database of all vehicles and equipment | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Details of alternate public transportation routes due to Project activities | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Planned route diversions details | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Noise level monitoring | <input type="checkbox"/> Yes/ <input checked="" type="checkbox"/> No | | |
| Air quality monitoring | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Photo documentation of issues | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Photo documentation of mitigation adopted | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Incident register | | | |
| Training log | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| Complaint register | <input type="checkbox"/> Yes/ <input type="checkbox"/> No | | |
| | | | |
| | | | |

APPENDIX L: RESETTLEMENT POLICY FRAMEWORK (RPF)

1. INTRODUCTION

1.1 NDSP Phase-II Project Background

NDDB has proposed the National Dairy Support Project Phase II Project (herein after also referred as 'Project') for World Bank support with the broad objective 'To enhance competitiveness, foster inclusion, improve resilience and reduce the carbon footprint of milk value chains, focusing on small farmers in project areas'. The Project will focus on less dairy developed States, which have been identified based on the supply infrastructure of Producer Owned Institutions (POIs) (functional Dairy Cooperative Societies (DCSs)/ Milk Pooling Points (MPPs) coverage, milk procurement share and processing capacity) and liquid milk marketing coverage. Further, due representation has been given to the hilly & North-Eastern States. Accordingly, 6 States have been identified for the project, viz. Jharkhand, Odisha, Madhya Pradesh, Himachal Pradesh, Uttarakhand, and Sikkim. The pilot activities envisaged in the project may be located within or outside the identified Indian states

1.1 RPF Context

The execution of NDSP-II will envisage the requirement of land in terms of setting up of any physical facilities for relevant project components.

ESS-5 requirements are applicable whenever land is acquired or involuntary resettlement occurs due to the project or due to land use restrictions caused by project activities during project life cycle that results in displacement of project affected persons (PAP). Displacement can be either in form of physical displacement (relocation, loss of residential land, or loss of shelter) and/or economic displacement (loss of land, assets, or access to assets leading to loss of income sources or other means of livelihood) or both and could be both permanent as well as temporary and short term in nature. Any project related private land purchase is considered *voluntary* when it is established that the key elements for voluntary land purchase (as discussed under **Section 3.3.2**) are fulfilled, else the ESS-5 requirements will apply.

Additional land requirement for project activities and the method of land procurement will be determined by POIs at the time of submitting their proposals to NDDB for project sanctioning and will thereafter determine the nature of measures that need to be put in place for land transactions that may be voluntary or involuntary.

In view of this, this RPF is prepared to guide POIs for understanding of ESS-5 requirements applicability in their project and to ensure implementation of the same.

2. LAND PROCUREMENT CONTEXT

2.1 Indicative Land Footprint

The four components of NDSP Phase-II project includes several sub-components and activities and there are limited activities of these project components that will be requiring additional land footprint for executing that specific activity and these activities are listed in **Table 2-1**.

Table 2-1 Project activities and indicative land footprint

| Activities that will entail land requirement | Level of Intervention | Total units | Probable land take approach |
|---|-----------------------|-------------|--|
| Component B 1- Strengthening the Dairy Supply Chain System | | | |
| Setting up new DCS/MPP centre at village level | DCS/MPP member | 4000 | <ul style="list-style-type: none"> Required space for new DCS/MPP centre is likely to be provided on lease by one of DCS/MPP member like other operational DCS/MPP or provided by the local body from |

| Activities that will entail land requirement | Level of Intervention | Total units | Probable land take approach |
|--|--|-------------|--|
| | | | <p>available pool of public land or will be leased by the DCS.</p> <ul style="list-style-type: none"> ■ No land acquisition is expected, ■ Only minor civil construction is envisaged and possibility of temporary restrictions or land use or access to public facilities may occur during construction/ upgradation of DCS and during installation of plant & machinery within the DCS is unlikely. |
| Setting up Bulk Milk Chillers (BMCs) at village level | Interested Individual at village level | 587 | <ul style="list-style-type: none"> ■ BMC will be installed in the premises of the DCS. ■ BMC/chilling centre will be on own land or take land/ building on lease for this purpose. ■ No land acquisition is anticipated |
| Establish Community Milking Centre (CMC) at village level | POIs | 100 | <ul style="list-style-type: none"> ■ POIs is expected to develop the centre within the DCS/MPP or lease land for establishing CMC. ■ No private land acquisition is anticipated |
| Setting up village level pasteurisation and product manufacturing unit in remote areas | Interested Individual at village level | 10 | <ul style="list-style-type: none"> ■ Required space for village level pasteurization and product manufacturing unit is likely to be provided by DCS or will be taken on lease by the DCS or provided by the local body from available pool of public land. ■ Temporary restrictions or land use or access to public facilities may occur during construction and during installation of plant & machinery. |

Component C 1- Promotion of scientific feeding practices

| | | | |
|-----------|-----|----|--|
| TMR Plant | POI | 14 | <ul style="list-style-type: none"> ■ To be established on the land owned by POIs, or land to be taken on lease. ■ Temporary restrictions or land use or access to public facilities may occur during construction/ and during installation of plant & machinery. |
|-----------|-----|----|--|

Component C 2- Demonstration of Fodder Production and Conservation Technologies

| | | | |
|---|------|------|--|
| Fodder Seed Processing Plant | POIs | 2 | <ul style="list-style-type: none"> ■ Available land with POIs will be used. In case of non-availability, land will be leased or purchased through negotiated settlement by the POIs. ■ No private land acquisition is anticipated |
| Large Silage Production Unit | POIs | 2 | <ul style="list-style-type: none"> ■ Available land with POIs will be used. Alternatively, land will be leased by POIs. ■ Temporary restrictions or land use or access to public facilities may occur during construction and installation of plant & machinery. |
| Small Silage Production Unit at village level | POIs | 1500 | <ul style="list-style-type: none"> ■ Land available with the DCS/ DMU will be used or taken on lease by the POIs |

| Activities that will entail land requirement | Level of Intervention | Total units | Probable land take approach |
|--|-----------------------|---------------------|--|
| Community level green fodder production at village level | POI and DCS/MPP | 38 acres (15.38 ha) | <ul style="list-style-type: none"> ■ 0.5 to 1 hectare area required per demonstration unit. ■ DCS members or progressive local farmers will participate on a voluntary basis- project will incentivise the selected farmers ■ Land will not be acquired |

Source: NDSP Phase-II Project DPR

It is also important to note here that Detailed Project Report (DPR) of NDSP Phase-II Project clearly states that the project does not envisage any land acquisition and associated rehabilitation and resettlement during project execution. Most works will take place within the premises of selected POIs and are expected to be free from any encumbrances. In case of presence of squatters or encroachers, they will be rehabilitated in a manner consistent with ESS5. All project supported activities requiring acquisition of private land or involuntary resettlement have been put in the list of project exclusions. Further, NDDDB will ascertain while appraising the sub project plan (SPP) submitted by POIs that required land available with POIs for setting up of the infrastructure does not require any private land acquisition, is free from encumbrances and any additional land procurement by POIs (if required) is arranged on the basis of 'willing buyer – willing seller' approach. Thus, the Project does not envisage any involuntary land acquisition.

2.2 Potential Scenarios to identify risks and impacts

This sub-section discusses the potential risk and impacts related to land procurement and land use restriction under different potential scenarios for the POIs.

Table 2-2 Potential risks and impacts under different land transaction scenario

| Potential Scenarios | Potential risks & impacts |
|--|---|
| Adequate land is available at a village and/or POI level | <ul style="list-style-type: none"> ■ Potential encroacher/ squatters on land owned and identified by POI for project activity. Encroachment may be in the form of residential structures (like huts, tin shed etc.), commercial structures (like teashops or any other petty shops), any other immovable assets, planted fruit trees/timber trees, standing crops etc.; ■ Removal of encroachment may lead to physical and/or economical displacement of encroachers and will be entitled for compensation for their lost assets (structures, trees), standing crops and means of livelihood assistance. |
| Voluntary land procurement for project activity | <ul style="list-style-type: none"> ■ In case of land purchase for project activities, POIs will need to document and establish that all requirements described under section 3.3.2 are fulfilled. In case any of these requirements are not met, then the land transaction will be treated as involuntary and ESS-5 requirements will be applicable; ■ If a purchase, lease, or other type of land transfer includes land on which people other than the owner live or have use, whether formally or as customary or informal occupants at the time of the transaction, ESS5 applies. For example, users of procured land (like dwellers, petty shops owner, sharecropper etc.) will be eligible for compensation and R&R assistance commensurate with their losses and impacts at replacement rate; |

| Potential Scenarios | Potential risks & impacts |
|--|--|
| | <ul style="list-style-type: none"> ■ There may be restrictions or additional requirement to be fulfilled prior to entering in any land transaction with landowners from <i>Scheduled Caste</i> community in respective states for which all national and state-specific legal requirements will need to be followed; ■ Similarly, transaction of land owned by Scheduled Tribe community specifically in Scheduled V area may have restrictions for which prescribed procedures will need to be followed.. However, all activities posing significant and adverse risks to the tribal communities have been put in the list of project exclusions. |
| Voluntary land donation for project activity | <ul style="list-style-type: none"> ■ In case of land donation for project activities, POIs will need to document and establish that all requirements described under section 3.3.3 are fulfilled. In case of any gap, such land transaction will not be considered as voluntary donation and ESS-5 will apply; ■ Any land users dependent on the land identified for donation for project activity will be treated as PAP and will be eligible for compensation and R&R assistance commensurate with their losses and impact. |
| Land use/access restrictions | <ul style="list-style-type: none"> ■ Project activity causing any displacement (physical and/or economical) during project period -either permanent or temporary displacement ; ■ Affected persons will be eligible for compensation and R&R assistance commensurate with their losses and impacts. |
| Compulsory land acquisition | <ul style="list-style-type: none"> ■ Not envisaged under the project. |
| Damage to private Structures | <ul style="list-style-type: none"> ■ During construction activity and movement- installation of plant and machinery in the POIs, there could be damage to private properties which will need to be compensated. |

3. LEGAL AND POLICY FRAMEWORK

3.1 Involuntary Land Acquisition

Involuntary land acquisition by POIs through invoking land acquisition regulation of the country is not envisaged for the project as discussed in **sub-section 2.1**. Further, section 7.3 of revised Project DPR of NDSP Phase-II clearly mention following provision on land take approach for the project;

- The project does not envisage any acquisition of land, and associated rehabilitation and resettlement in the project area;
- Village level institutions would be set up at the building arranged by the POIs in an encumbrance free manner;
- Most of the POIs already possess excess land and POIs will ensure that the land available for setting up of infrastructure is free from encumbrances.

3.2 Legal Provision for Voluntary Land Procurement

Any land procurement by POIs through direct purchase or lease for NDSP Phase-II project activities, should be aligned with applicable provisions of the revenue code of the six states where project will be implemented.

Specific safeguards for consideration while screening through revenue code of the states includes following aspects;

- Identify potential restriction and /or additional requirements to be fulfilled prior to land procurement (direct purchase/lease) from Scheduled Caste community members in respective states;
- Identify potential restriction and /or additional requirements to be fulfilled prior to land procurement (direct purchase/lease) from Scheduled Tribes community members in respective states, specifically in Scheduled V area;
- Identify additional requirements for land transaction (direct purchase/lease) for non-domicile individual or agency.

Applicable revenue codes of the six states is provided below for quick reference for POIs.

Table 3-1 Land Revenue Code of six states

| State | Regulation | Key Provisions |
|----------------|---|---|
| Madhya Pradesh | <ul style="list-style-type: none"> ■ The Madhya Pradesh Land Revenue Code Act, 1959 - The Madhya Pradesh Land Revenue Code Act, 1959 (prsindia.org); ■ The Madhya Pradesh Land Revenue (Amendment) Act 2011- MADHYA PRADESH LAND REVENUE CODE (AMENDMENT) ACT, 2011 (indianemployees.com). | <ul style="list-style-type: none"> ■ Section 170, 170 A & 170 B of MP land revenue code clarifies the restriction in land transaction with aboriginal scheduled tribes' community. |
| Odisha | <ul style="list-style-type: none"> ■ Odisha Land Reforms Act 1960- https://prsindia.org/files/bills_acts/acts_state_s/odisha/1960/Odisha%20Act%2016%20of%201960.pdf | <ul style="list-style-type: none"> ■ Section 22 of Odisha Land Reforms Act defines restriction of land transaction between schedule tribes <i>Raiyat</i> (landowner) to non-scheduled tribes. It is permissible only after getting prior approval from Revenue Officer basis of satisfying the criteria defined under this section; ■ Section 22(5) lays down similar land transaction restriction with land owners from Scheduled Caste community. |
| Jharkhand | <ul style="list-style-type: none"> ■ The Chotanagpur Tenancy Act 1908, Jharkhand - https://www.indiacode.nic.in/bitstream/123456789/7796/1/the_chota_nagpur_tenancy_act%2C1908.pdf | <ul style="list-style-type: none"> ■ Section 46 of this Act restricts the land transaction by scheduled caste, scheduled tribes and other backward caste community to the same community who is a resident within the local limits of the area of the police station within which the holding is situate. |
| Uttarakhand | <ul style="list-style-type: none"> ■ Kumaun and Uttarakhand Zamindari Abolition and Land Reforms Act, 1960- Kumaun and Uttarakhand Zamindari Abolition and Land Reforms Act, 1960 (bareactslive.com) ■ The Uttarakhand (The Uttar Pradesh Zamindari Abolition and Land Reforms Act 1950) Amendment Act 2019 - 19.PDF (uk.gov.in) | <ul style="list-style-type: none"> ■ Section 131 of Zamindari Act 1950 defines categories of Bhumidhar (land owner) with non-transferable rights; ■ Section 131 (B) further defines the criteria for Bhumidhar with non-transferable rights to become a Bhumidhar with transferable rights; ■ Section 157 (A) defines the potential restriction on transfer of land by member of Schedule Caste (SC) community; ■ Section 157 (B) defines the potential restriction on transfer of land by member of Schedule Caste (SC) community. |

| State | Regulation | Key Provisions |
|------------------|--|---|
| Himachal Pradesh | <ul style="list-style-type: none"> ■ The Himachal Pradesh Land Revenue Act 1954 - THE HIMACHAL PRADESH LAND REVENUE ACT, 1954-33109512.pdf ■ The Himachal Pradesh Transfer of Land (Regulation) Act 1968 - Microsoft Word - THE HIMACHAL PRADESH TRANSFER OF LAND REGULATION ACT, 1968.docx (indiacode.nic.in) | <ul style="list-style-type: none"> ■ Section 3 (1) of land regulation act 1968 requires scheduled tribes land owner to obtain prior permission from state government before transferring his interest in any land including any constructed premises by way of sale, mortgage, lease, gift or otherwise to any person not belonging to such tribes; ■ Section 4 delineates the process of obtaining permission for land transfer from deputy commissioner of the region. |
| Sikkim | <ul style="list-style-type: none"> ■ The Sikkim Regulation of Transfer of Land Act 2005 - https://prsindia.org/files/bills_acts/acts_state/sikkim/2005/2005SK18.pdf ■ Sikkim Agricultural Land Ceiling and Reforms Act, 1977 - http://bareactslive.com/SIK/sik016.htm | <ul style="list-style-type: none"> ■ Section 3(1) of 2005 Act provides that 'No transfer of land belonging to any person, by way of sale, gift, exchange, mortgaged or sublet with possession shall be valid in favour of a person who is not an agriculturist'. The Act defines "agriculturist" as a landowner who cultivates land personally in a holding situated in Sikkim; ■ Section 29 (2) of Land ceiling and Reform Act 1977 restrict the land transfer rights for scheduled tribe (ST) community within the community. Any land transaction by ST to non-ST person will require prior permission from Revenue Officer. |

3.2.1 Right To Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013

The Act provides for enhanced compensation and assistances measures and adopts a more consultative and participatory approach in dealing with the Project Affected Families (PAFs) whose land has been acquired or proposed to be acquired or whose livelihood are affected by such acquisition. The Act also makes provisions for such affected persons for their rehabilitation and resettlement for ensuring that the cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement in their post-acquisition social and economic status.

The Rehabilitation and Resettlement Package under the Act is broader in terms of elements. Apart from monetary compensation for acquired land and assets, it has provision to provide for employment, allotment of alternative housing units, another land, and other entitlements, allowance and grants to make up for the loss of occupation or opportunity owing to displacement, infrastructure facilities at the resettled place. Monetary compensation for acquired land is determined basis of current market value, multiplication factor, 100% solatium and 12 interest rate for the period between initial notification and date of award/possession. Assets compensation also consider solatium and interest payment in addition to its current market.

Assets compensation determination also consider 100% solatium and 12% interest rate for loss of assets (i.e. land, structure, trees etc.) includes compensation for acquired land and assets at and for loss of livelihood opportunities are summarised below;

3.3 World Bank ESS-5

3.3.1 ESS-5 Requirements

Requirements of ESS-5 will be applicable for any involuntary resettlement situation in the project, triggered through either involuntary land acquisition, temporary economic displacement or by way of restrictions on land use due to project activities during project life cycle. Although involuntary land acquisition is not envisaged for the project, but the likelihood of restriction on land use or access to facilities could lead to loss of income of affected persons. Therefore, ESS-5 requirements will be applied by POIs appropriately to address any potential impacts arising due to land use restriction during project period. Key requirements of ESS-5 is summarised below;

- General requirements which includes:
 - Defining eligibility classification of PAPs,
 - Feasible alternative project designs considered to avoid or minimize land acquisition or restrictions on land use,
 - Compensation for lost assets at full replacement cost,
 - Community engagement,
 - Grievance Mechanism for PAPs, and
 - Resettlement planning & implementation;
- Displacement includes physical displacement and economic displacement. In case of physical displacement (regardless of number of persons affected), a Resettlement Action Plan (RAP) will be prepared that will include at a minimum, applicable requirements, mitigation measures, development opportunity, budget & implementation schedule. In case of economic displacement, the plan will include measures to allow affected persons to improve, or at least restore, their incomes or livelihoods to pre-project levels;
- Establishing collaboration with other responsible agencies for implementation of resettlement plan.

3.3.2 Voluntary Land Procurement

In case of voluntary land purchase by POIs for any project activity, ESS-5 requires a due diligence to be conducted to confirm fulfilment of following requirements to declare any land purchase as voluntary;

- Functioning land markets exist;
- The transaction has taken place with the owner's informed consent;
- The owner was aware that it was possible to refuse to sell, and would not be subject to compulsory acquisition; and
- The owner was paid a fair price based on prevailing market values.

3.3.3 Voluntary Land Donation

In case of voluntary land donation by community members for initiating any project activity, POIs will be required to demonstrate that:

- The potential donor or donors have been appropriately informed and consulted about the project and the choices available to them;
- Potential donors are aware that refusal is an option, and have confirmed in writing their willingness to proceed with the donation;
- The amount of land being donated is minor and will not reduce the donor's remaining land area below that required to maintain the donor's livelihood at current levels;

- No household or physical relocation is involved;
- The donor is expected to benefit directly from the project; and
- For community or collective land, donation can only occur with the consent of individuals using or occupying the land.

POIs will need to maintain a transparent record of all consultations and agreements reached with stakeholders involved in this voluntary land donation.

4. ELIGIBILITY AND ENTITLEMENT MATRIX

As stated in earlier section, involuntary land acquisition using eminent domain law of the country is ruled out for the project. However, ESS-5 requirements still apply in certain involuntary resettlement like scenarios that might occur even in absence on involuntary land acquisition and these potential scenarios are discussed earlier under **Section 0**. The impacted persons under these scenarios will be recognized for R&R assistance entitlements under certain eligibility criteria as discussed below.

4.1 Principles

The guiding principles for POIs to undertake land procurement and managing any associated resettlement impact will include;

- The project activities across project components will avoid physical and economic displacement;
- The selection of the land/site and finalization of the land footprint will be undertaken in accordance to a formal process of site screening using the site screening check list including avoidance criteria adopted by POIs;
- Voluntary land purchase by POIs should happen with informed consent of land seller and with fair price for purchased land based on prevailing market rate. The owners of the land must be able to refuse to sell without the threat of compulsory acquisition.
- Consultation with affected persons, families throughout the project activity duration that caused displacement;
- Project affected persons (PAPs) will be eligible for compensation for losses, including restrictions of access and land use resulting from project intervention irrespective of possession of formal title to land;
- All compensation for lost assets will be at replacement cost;
- Possession of land and related assets may take place only after compensation has been paid;
- Functional GRM of POIs will be made available to all PAPs to lodge complaints and suggestions regarding resettlement, compensations and other issues related to the project;
- Documentation of land procurement process by POIs for any project activity and period monitoring by NDDB on managing resettlement impact by POIs.

4.2 Eligibility

In view of the potential land procurement scenarios at the outset of the project and probable land use/access restriction situation during project duration as discussed in earlier section, affected persons will be eligible for R&R assistance under this RPF. The eligible PAPs in the context of project activity will include:

- Encroachers or squatters on the land owned by POIs;

- Land users other than land owners on the land area purchased/leased on POI;
- Land users other than land owners on the land being donated to POI for project activity;
- Any person getting affected by land use restrictions caused by project activity for temporary or permanent duration during project period; and
- Land sellers to POI, in case all elements of voluntary land purchase as per ESS-5, is not met

4.2.1 Cut-off date

In view of the potential land procurement scenarios, the date of physical verification by POI representative of site location as part of land procurement process will be considered as cut-off date for identifying any potential land user and their nature of dependency on such land parcels. Any additional user identified after the cut-off date will be considered as opportunistic encroacher and will not be considered for any entitlement as per this RPF document.

4.3 Entitlement

Displacement impacts under the different potential scenarios may include either temporary physical relocation or economic displacement or both. Each individual PAP will be eligible for a combination of entitlements commensurate with their loss of assets, income and livelihood means connected with lost assets.

Table 4-1 Entitlement Matrix

| S. No | Loss and Impacts | Entitled Persons | Entitlements |
|-------|--|--|---|
| 1 | Loss of or partial damage to residential structure and temporary or permanent relocation | <ul style="list-style-type: none"> ■ Non- titleholders, encroacher and/or squatter on land owned by POI ■ Land users (other than land owner) | <ul style="list-style-type: none"> ■ Compensation for structures at replacement cost; ■ Right to salvage all usable materials from the lost structures ■ Transfer and reconstruction allowance. |
| 2 | Loss of or partial damage to commercial structure and any other fixed structure and associated livelihood opportunity | <ul style="list-style-type: none"> ■ Non-titleholder, encroacher and/or squatter on land owned by POI ■ Land users (other than land owner) | <ul style="list-style-type: none"> ■ Compensation for commercial or other fixed structures at replacement cost; ■ Right to salvage all usable materials from the lost structures ■ Business restoration allowance. |
| 4 | Loss of privately owned trees and standing crops | <ul style="list-style-type: none"> ■ Land owner | <ul style="list-style-type: none"> ■ Compensation for privately owned trees at replacement cost; ■ Compensation for standing crops or wait for taking land possession till standing crops are harvested |
| 5 | Loss of or damage to residential and/or commercial structure for temporary period caused by project activity during project implementation period. | <ul style="list-style-type: none"> ■ Land users with or without land title | <ul style="list-style-type: none"> ■ Compensation for affected structures at replacement cost; ■ Right to salvage all usable materials from the lost structures ■ Temporary, alternative housing allowance ■ Shifting allowance |

4.3.1 Market Valuation

POIs will follow the guidelines discussed below to determine replacement cost for lost assets for any affected persons.

- *Replacement cost for impacted structures:* should be determined to arrive at value, which is adequate to replace the similar new structure with necessary transaction cost (if required). Depreciation should not be considered while assessing the replacement cost. Key factors to be considered in the process of replacement cost estimation, includes;
 - Measurement data of affected structures (like length, breadth, height, plinth area etc.);
 - Categorisation of structure in terms of Pucca/Semi-pucca/Kutchra;
 - Construction material and current market rates of those material;
 - Latest valuation rates issued by Public Works Department (PWD) office of respective district/state;
 - Valuation of through independent registered valuer in the project area
 - Transaction, registration cost etc. if required
- *Replacement cost for impacted trees:* for privately owned timber trees, valuation should be carried out using the services of horticulture department for measurement of standing trees and latest valuation rates issued by forest department of project area. For valuation of fruit trees, it may be necessary to adjust compensation to reflect that it can take several years after replanting before such trees.
- *Market price valuation for land transaction:* while arriving at market value for land purchase, POIs should consider:
 - District level official market rate of land issued by district collector of project location;
 - Where functional market for land transaction exist, current market rate in close vicinity of project footprint should also be assessed.

5. IMPLEMENTATION ARRANGEMENT

5.1 Site Screening, Actual Site Identification, Optimising Land Footprints, Consultation & Participation and Disclosure

5.1.1 Site screening

POIs will use the screening checklist format (attached with this RPF document) for identifying potential risks and impacts associated with additional land requirement for SPP. The filled up check list along with required documentary evidence will be submitted as part of overall SPP to respective SLTMC (State Level Technical Management Committee) that will be examined by NDDB.

5.1.2 Avoidance criteria

POIs will be recommended to apply avoidance measures as discussed below to avoid or at least minimise any potential resettlement impacts.

- In case of selecting land owned by POIs for project activity, squatter with their residential structure in it (if there exist any) should be avoided to ensure no physical displacement;
- Vacant land without any livelihood dependency or assets (structure, trees etc.) should be preferred.

5.1.3 Proposal Submission to NDDB

Proposal submission to NDDB by POIs will include filled in 'Screening Checklist - Land procurement and impact assessment' for all SPPs that are covered in the proposal. This will help NDDB in having clear understanding of any potential resettlement impact that might be associated with the specific SPPs.

5.1.4 Implementation of Safeguards under each scenario

Specific steps to be followed by POIs under different land procurement/ resettlement impact scenarios are discussed under this section.

5.1.4.1 Adequate land is available at a village and/or POI level

- Site screening to identify any encroachment, livelihood dependency, assets etc.;
- Avoid land area with residential structure/other immovable assets therein or livelihood dependency that could be damaged or adversely impacted due to project activities;
- Identify users of land footprint finalised for SPP and assessment of impacts in terms of loss of assets (structure, trees, standing crops), loss of livelihood opportunity;
- Valuation of lost assets on the basis of full replacement cost;
- Disbursement of compensation for lost assets before initiating civil work;
- Ensure alternate livelihood opportunity to affected person e.g. providing jobs in operations of POIs

5.1.4.2 Voluntary land procurement through land purchase or lease

- Site screening to identify any dependent users (like tenant, shopkeepers, sharecroppers etc.) other than land owner and avoid such land footprint to the extent feasible;
- If there are users other than land owners on the area identified for purchase/lease, then assess impacts in terms of loss of assets (structure, trees, standing crops), loss of livelihood opportunity;
- Valuation of lost assets basis of full replacement cost criteria in addition to land purchase/lease value;
- Disbursement of compensation for lost assets before dismantling the structures and taking possession of purchased/leased area;
- Ensure alternate livelihood opportunity to affected person e.g. providing jobs in operations of POIs
- Documentation of the process followed for land purchase/lease with landowners;
- In case of land purchase, POIs will need to document and establish that all requirements described under **section 3.3.2** are fulfilled to declare land purchase as 'voluntary land purchase'.

5.1.4.3 Voluntary land donation for project activity

- Site screening to identify any dependent users (like tenant, shopkeepers, sharecroppers etc.) other than land owner willing to donate land to POI for SPP and avoid such land footprint to the extent feasible
- Ensure that donors are appropriately informed/consulted about the project and they have to right to refuse and have confirmed in writing their willingness to proceed with the donation;
- Ensure that land received in donation, do not involve any household relocation and donor do get project benefit.

5.1.4.4 Land use/access restrictions

- Identify potential resettlement impact and affected persons beforehand due to project related activity during project implementation period and avoid such impacts to the extent feasible;
- Assessment of resettlement impacts in terms of loss of assets (structure, trees, standing crops), loss of livelihood opportunity;
- Valuation of lost assets basis of full replacement cost criteria;
- Disbursement of compensation for lost assets before dismantling the assets and carrying out the project activity;
- Provision for livelihood compensation commensurate with displacement period;
- In case of permanent economic displacement, provision for alternate livelihood opportunity to affected person e.g. providing jobs in operations of POIs.

5.1.5 Consultation, Participation & Disclosure

As part of ESS-5 requirements, POIs will be required to engage with landowners and any affected land users or community members with the purpose of:

- Disseminating relevant project information (which is triggering the need for displacement);
- Disseminating alternatives considered for avoiding/minimising potential displacement impacts while finalising the site footprint required for SPP;
- Disclosure of due entitlement for any potential PAPs and GRM process during consultation process;
- Informed & meaningful participation of affected persons and/or community members in decision making for finalising resettlement plan
- Engagement with PAPs throughout the project duration i.e. planning, implementation, monitoring, and evaluation of the compensation process, livelihood restoration activities etc.

POIs will carry out additional engagement in tribal dominant areas (i.e. Scheduled V Area) as per the stakeholder engagement mechanism discussed in SEP and the IPPF document of the project and land procurement related requirement may also be covered in these consultation with tribal community.

5.2 Grievance Redress Mechanism

Potential grievances of affected land owners and land users is likely to be handled and resolved by POI representative who will be responsible for finalising land procurement for NDSP Phase-II project activities. In addition to this, PAPs and other affected community members will also be informed about existing functional GRM that will be established by POI as recommended in SEP document.

5.3 Monitoring and Evaluation

There will be a Project Management Cell (PMC) for each POI, to monitor the implementation of sub-project plans (SPPs) and report to NDDB on monthly, quarterly and annual frequency. E&S performance of POIs will also be included in these monitoring reports, including update on resettlement plan implementation wherever applicable. POIs will use the '*The Resettlement Planning and Implementation Monitoring Format*' to update NDDB on any resettlement impacts and mitigation measures taken up in their monthly monitoring.

5.4 Resettlement implementation updates as provided by POIs to NDDB, will also be further verified by External M&E Consultants (agencies) that

will hired by NDDB based on the procurement guidelines of World Bank. Budget

POIs will be responsible to bear the cost for resettlement implementation that may include compensation for moveable and/or immovable assets on required land parcels for the project and any additional livelihood restoration support for PAPs in alignment with ESS-5 requirements.

POIs will access the existing institutional mechanism for the project (such as GRM, Monitoring & Evaluation arrangement etc.) and therefore no additional cost is envisaged in this regard.

The resettlement due to the project interventions is not likely under NDSP II, however Rs. 50 Lakh is budgeted, under the overall budget of implementing ESMF for RPF monitoring.

Table 5-1 RPF Budget under ESMS

| S. No | Expense head | Amount |
|-------|---|----------------|
| 1 | IEC activities, training and capacity building on RPF implementation | 10 lacs |
| 2 | Site visit to the specific locations where RPF is triggered and stakeholder consultations | 40 lacs |
| | Total Budget | 50 lacs |

Annexure 1: Screening Check List - Land Requirement & Impact Assessment

| | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|----|
| General Information on proposed Sub Project Plan (SPP) location | SPP Name | | | | |
| | Name of village | | | | |
| | Name of Tehsil | | | | |
| | Name of District | | | | |
| | Name of State | | | | |
| | Site location map | | | | |
| | Does the SPP require land footprint? Yes / No | | | | |
| Provide details on final land footprint identified for SPP | 1) Details of land requirement and structures (type/ ownership, number, use etc.): 2) Type & number of privately owned trees and other assets: 3) Any other land use: | | | | |
| Avoidance criteria | Detail of alternative sites checked by POI and associated potential impacts with those alternative sites: | | | | |
| Method of land procurement Please tick mark(√) | <input type="checkbox"/> Option 1: Adequate land already available with POI for executing SPP <input type="checkbox"/> Option 2: Voluntary land procurement (purchase) <input type="checkbox"/> Option 3: Voluntary land procurement (based on lease/hiring) <input type="checkbox"/> Option 4: Public land transferred from the government or local body <input type="checkbox"/> Option 5: Voluntary land donation | | | | |
| Screening questions | | | Tick mark(√) | | |
| | | | Yes | No | NA |
| Option 1: Land available with POI | 1. Whether available land with POI, is free from any sort of encroachment/squatters | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 2. Is there any residential structure (like huts, tin shed etc.) on available land? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 3. Is there any livelihood dependency for anyone on available land with POI? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 4. Is there any commercial structure (like teashops or any other petty shops) on available land? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 5. Is there any other privately owned immovable assets (like bore well, hand pump etc.) on available land? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 6. Is there any standing crops or trees planted by user or other assets on identified land parcel? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Option 2: Voluntary land procurement (Purchase/Lease) | 7. Is landowner fully informed on purpose of land purchase/lease by POI for SPP? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 8. Does the landowners have an option to deny the land transaction? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 9. Is the land price or lease rate determined basis of prevailing market rate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 10. Does the functional land market exist for seller to invest the sale proceeds in buying alternate equivalent land area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

| | | | | |
|--|--|--------------------------|--------------------------|--------------------------|
| | 11. Are there any land user other than landowner (like tenant, sharecropper etc.) connected to the land area identified for land purchase/lease by POI? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 12. Has the land users also been consulted by POI prior to finalising agreement with landowner for land purchase or land lease? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 13. Are there any immoveable assets (like residential structures, commercial structures etc.) belonging to land users on land area purchased/leased by POI? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 14. Is there any livelihood dependency of land users of land area purchased or leased by POI? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 15. Has the land user been compensated for their immoveable assets? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 16. Has POI taken any measures to compensate lost livelihood opportunity for land users? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Option 2: Voluntary land donation | 17. Were the land owners appropriately informed about the project | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 18. Whether potential donors have an option of refusal and if they are willing to confirm donation in writing? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 19. Whether land donation will lead to physical relocation of any family? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 20. Is donor expected to benefit directly from the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 21. Is there anyone using or occupying the community or collective land identified for donation and whether the consent has been taken from individuals using or occupying the land. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Annexure 2: RPF Monitoring Format

| <u>S. No</u> | <u>Monitoring Parameters</u> | <u>Status/Response</u> |
|--------------|---|------------------------|
| 1 | Has there been any involuntary economic or physical displacement caused by project interventions? If yes, provide details of the location and type of resettlement impacts. | |
| 2 | Number of PAPs identified along with specific details on resettlement impact caused by project intervention | |
| 3 | Details on consultation and information disclosure with PAPs | |
| 4 | Compensation determination in alignment with FRC criteria and disbursement status | |
| 5 | Any additional support or livelihood restoration measures provided to PAPs | |
| 6 | PAP's grievances and action taken by POIs | |
| 7 | Due diligence report to confirm four key elements to declare any land purchase by POIs for project activity as Voluntary land purchase and rule out ESS-5 relevance | |
| 8 | RPF implementation status report | |

Note: *This RPF reporting will take place till the time the resettlement impacts have been addressed / mitigated in that specific location.*

APPENDIX M: BIODIVERSITY MANAGEMENT FRAMEWORK

1. ECOLOGICAL SENSITIVITIES

The Project will be implemented in five states, viz. Odisha, Madhya Pradesh, Jharkhand, Himachal Pradesh and Uttarakhand.

1.1 Forest Cover for the concerned states

Forest areas at the concerned states and percentage of forest cover are presented in **Table 1.1**.

Table 1.1 Forest areas in concerned states (2021)

| S No. | State | Geographical Area (sq. km) | Very dense forest (km ²) | Mod. dense forest (km ²) | Open forest (km ²) | Total Forest (km ²) | % of geographical area |
|-------|------------------|----------------------------|--------------------------------------|--------------------------------------|--------------------------------|---------------------------------|------------------------|
| 1 | Odisha | 1,55,707 | 7,213 | 20,995 | 23,948 | 52,156 | 33.50 |
| 2 | Madhya Pradesh | 3,08,252 | 6,665 | 34,209 | 36,619 | 77,493 | 25.14 |
| 3 | Jharkhand | 79,716 | 2,601 | 9,689 | 11,431 | 23,721 | 29.76 |
| 4 | Himachal Pradesh | 55,673 | 3,163 | 7,100 | 5,180 | 15,443 | 27.73 |
| 5 | Uttarakhand | 53,483 | 5,055 | 12,768 | 6,482 | 24,305 | 45.44 |

Source: http://www.frienviis.nic.in/Database/Forest-Cover-in-India-2021_3550.aspx

1.2 Ecologically Sensitive Areas for the concerned states

List of ecologically sensitive areas viz. National Park, Wildlife Sanctuary and Key Biodiversity Areas (KBA) is shown in **Table 1.2** and the maps of the ecologically sensitive areas for the states are presented in **Appendix- A**.

Table 1.2 List of National Park, Wildlife Sanctuary and KBAs in concerned states

| S No | State | National Park | Wildlife Sanctuaries | KBA |
|------|----------------|--|---|---|
| 1 | Odisha | <ul style="list-style-type: none"> Bhitarkanika NP Simlipal NP | <ul style="list-style-type: none"> Badrama WLS Baisipalli WLS Debrigarh WLS Kuldiha WLS Satkosia Gorge WLS Sunabeda WLS Chilika WLS | <ul style="list-style-type: none"> Bhitarkanika Wildlife Sanctuary Chandka–Dampara Wildlife Sanctuary Chilika Lake and Wildlife Sanctuary Mangala Jodi Satkosia Gorge Wildlife Sanctuary Simlipal National Park Sunabeda Wildlife Sanctuary Hirakud Reservoir |
| 2 | Madhya Pradesh | <ul style="list-style-type: none"> Bandhavgarh NP Kanha NP Madhav NP Mandla plant Fossils NP Van Vihar NP Panna NP Pench NP Sanjay NP Satpura NP | <ul style="list-style-type: none"> Bori WLS Bagdara WLS Phen WLS Pench WLS Ghatigaon WLS Gandhi Sagar WLS Karera WLS Ken Ghariyal WLS | <ul style="list-style-type: none"> Bandhavgarh National Park Barna Reservoir Bhoj wetland Bori Wildlife Sanctuary Dihaila Jheel Gandhi Sagar Wildlife Sanctuary and Reservoir Ghatigaon Wildlife Sanctuary Halali Reservoir Kanha National Park |

| S No | State | National Park | Wildlife Sanctuaries | KBA |
|------|------------------|---|--|---|
| | | <ul style="list-style-type: none"> Omkareshwar NP | <ul style="list-style-type: none"> Kheoni WLS Narsingharh WLS Kuno WLS Sajay-Dubri WLS Singhori WLS Son Ghariyal WLS Sardarpur WLS | <ul style="list-style-type: none"> Madhav National Park Panna National Park Pench National Park Rangawa Reservoir Ratapani Wildlife Sanctuary Sailana Kharmor Sanctuary Sardarpur Wildlife Sanctuary Yeshwantsagar Reservoir Pachmarhi Biosphere Reserve Sirpur Lake |
| 3 | Jharkhand | <ul style="list-style-type: none"> Betla NP Hazaribagh NP Palamau WLS and Tiger Reserve | <ul style="list-style-type: none"> Dalma WLS Gautham Buddha WLS Koderma WLS Lawalong WLS Hazaribagh WLS Palkot WLS Parasnath WLS Palamau WLS and Tiger Reserve Topchanchi WLS | <ul style="list-style-type: none"> Palamau Tiger Reserve Dalma WLS Hazaribagh WLS Topchanchi WLS Tilaiya Dam Reservoirs of Chotanagpur Plateau |
| 4 | Himachal Pradesh | <ul style="list-style-type: none"> Great Himalayan NP Pin Valley NP Inderkilla NP Khiri Ganga NP Simbalbara NP | <ul style="list-style-type: none"> Rupi Bhaba WLS Tundah WLS Kugti WLS Nargu WLS Bandli WLS Daranghati WLS Pong Dam Lake WLS Dhauladhar WLS Manali Sanctuary | <ul style="list-style-type: none"> Bandli Wildlife Sanctuary Chail Wildlife Sanctuary Churdhar Wildlife Sanctuary Daranghati Wildlife Sanctuary Dhauladhar Wildlife Sanctuary Gangul Siabehi Wildlife Sanctuary Govind Sagar And Nainadevi Wildlife Sanctuaries , Great Himalayan National Park Kais Wildlife Sanctuary Kalatop Khajjiar Wildlife Sanctuary Kanawar Wildlife Sanctuary Kibber Wildlife Sanctuary Kugti Wildlife Sanctuary Lippa Asrang Wildlife Sanctuary Majathal Wildlife Sanctuary Manali Wildlife Sanctuary Nargu Wildlife Sanctuary , Pin Valley National Park Pong Dam Lake Wildlife Sanctuary , Rupi Bhaba Wildlife Sanctuary Sangla (Rakchham Chitkul) Wildlife Sanctuary Sarah Valley, Lower Dharamshala , |

| S No | State | National Park | Wildlife Sanctuaries | KBA |
|------|-------------|--|---|---|
| | | | | <ul style="list-style-type: none"> Sechu Tuan Nala Wildlife Sanctuary Shikari Devi Wildlife Sanctuary Shimla Water Catchment Wildlife Sanctuary Talra Wildlife Sanctuary , Tirthan Wildlife Sanctuary Inderkilla National Park Khirganga National Park Lambri Forest (Banjar Forest Division) Simbalbara National Park |
| 5 | Uttarakhand | <ul style="list-style-type: none"> Gangotri NP Jim Corbett NP Nanda Devi NP Rajaji NP Valley of Flowers NP Govind pashu vihar NP | <ul style="list-style-type: none"> Askot Musk Deer WLS Govind Pashu Vihar WLS Kedarnath WLS Sonanadi WLS Mussoorie WLS Binsar WLS | <ul style="list-style-type: none"> Asan Conservation Reserve Askot Wildlife Sanctuary and Goriganga Basin Binog Sanctuary-Bhadraj-Jharipani Binsar Wildlife Sanctuary Corbett Tiger Reserve Govind National Park and Wildlife Sanctuary, Sandra, Kotigad and Singtur ranges (Tons forest division) Kedarnath Musk Deer Sanctuary & surrounding Reserve Forests Nanda Devi Biosphere Reserve New Forest Campus Rajaji National Park Sonanadi Wildlife Sanctuary Upper Pindar Catchment Area Valley of Flowers National Park Gangotri National Park Jhilmil Naina Devi Himalayan Bird Conservation Reserve Nandhour Wildlife Sanctuary Pawalgarh Conservation Reserve |

Source: <https://wii.gov.in>.

Rahmani, A.R., Islam, M.Z. and Kasambe, R.M. (2016) Important Bird and Biodiversity Areas in India: Priority Sites for Conservation (Revised and updated). Bombay Natural History Society, Indian Bird Conservation Network, Royal Society for the Protection of Birds and BirdLife International (U.K.). Pp. 1992 + xii

1.3 Requirement of Biodiversity Management Framework (BMF)

The project will be implemented in five states of India and multiple facilities will be developed as part of the NDDB-II phase of the project. Development of the project may potentially cause impact to biodiversity and ecosystem services of the area. Hence, there is a need to develop a Biodiversity Management Framework (BMF) for the project to safeguard the impacts to the biodiversity and ecosystem services. The BMF can be expanded to a detailed site specific Biodiversity Management Plan (BMP) for the concerned states. The BMP should be developed in accordance to World Bank's

Environmental and Social Standard- 6 (ESS6) *Biodiversity Conservation and Sustainable Management of Living Natural Resources* and International Finance Corporation's Guidance Note 6: *Biodiversity Conservation and Sustainable Management of Living Natural Resources (2019)*

Objective of ESS-6 is presented below;

- To protect and conserve biodiversity and habitats.
- To apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity.
- To promote the sustainable management of living natural resources.
- To support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.

2. BIODIVERSITY MANAGEMENT FRAMEWORK

2.1 Overview of Habitats

Habitats relevant for the Biodiversity Management Framework (BMF) include

- **Natural habitats:** According to IFC-Performance Standard (PS) 6, Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.
 - Terrestrial habitat: Natural forest land, natural grassland
 - Natural aquatic habitats: Rivers and streams, natural wetlands
- **Modified habitats:** According to IFC-PS 6, Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands.
 - Terrestrial habitat: Degraded forestland, forest plantations, agricultural land, scrub land
 - Natural aquatic habitats: constructed ponds in villages, dams, reclaimed wetlands
- **Critical Habitats:** According to IFC-PS 6, Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes. Both natural habitats and modified habitats could be a critical habitat based on threshold mentioned in IFC-PS6.

Biodiversity management framework for habitat and species presented in **Table 2.1**.

Table 1.3 Impact to Habitat and Species

| S No. | Habitats | Baseline Assessment | Impact | Mitigation measures |
|-------|----------------------|--|--|---|
| 1 | Terrestrial Habitats | <ul style="list-style-type: none"> • Identification of ecological habitats in the area • Identification of floral and faunal species in the area • Distance of the area from any ecological sensitive areas viz. Key Biodiversity Areas, Ramsar Sites, National Parks, Wildlife Sanctuaries etc (ecologically sensitive areas is the selected states presented in Appendix A). • Distance of the sites from any faunal movement corridors, migration corridors etc. • Identification of IUCN threatened, restricted range, migratory/congregatory species in the area | <ul style="list-style-type: none"> • Grazing on forestland will lead to removal of undergrowth viz. shrubs, herbs and saplings of large trees. • Grazing at the forest areas could loosen soil strata and cause erosion of forest soil. • Setting up of processing plant, booths/ parlours/ kiosks, dairy plant, TMR Plant, fodder seed processing plant within natural forest or natural grassland areas will lead to natural habitat loss for forest and grassland species • Waste released from chilling units if disposed to open lands may also impact biodiversity. • Propagation of invasive alien species may happen due to grazing as pollen/seeds may get transported • Cattle rearing, milk rearing, grazing etc. activities in proximity to habitats of IUCN threatened species, restricted range species, migratory species etc. could lead to disturbance due to noise (from | <p>Management measures should follow the mitigation hierarchy following avoidance, minimization and mitigation as mentioned below;</p> <ul style="list-style-type: none"> • Survey the project area to identify, categorize, and delineate natural and modified habitat types and ascertain their biodiversity value at the regional or national level before converting land for project activities. • Any processing plans booths/ parlours/ kiosks, dairy plant, TMR Plant, Fodder Seed Processing Plant etc. should be located outside National Protected areas (eg. National Park, Wildlife Sanctuary), Eco-sensitive Zone (ESZ) of Protected Area, KBA, Ramsar sites, World Heritage sites and also at least 0.5 km from natural forest areas. • Ensure that any natural or modified habitat converted for the project does not contain critical habitat or important wildlife breeding, feeding, and staging areas. • A biodiversity survey including Critical Habitat Screening (according to IFC-PS6) to be conducted in an area prior to establishment of any facility to identify natural habitats, presence of IUCN threatened, restricted range and migratory species in the area. • Presence of IUCN critically endangered or endangered species in the areas to be identified consider them during the preparation of the site specific BMP. • Invasive species management plan should be followed as per the WB ES-6 which includes³⁸; |

³⁸ 2016. "World Bank Environmental and Social Framework." World Bank, Washington, DC.

| S No. | Habitats | Baseline Assessment | Impact | Mitigation measures |
|-------|----------|---------------------|---|---|
| | | | <p>generator sets, movement of vehicles), light from the facility and may lead to displacement of the species from their habitat.</p> <ul style="list-style-type: none"> • Solid waste generated including waste feed, animal waste, animal carcass, packaging waste, used ventilation filters, unused / spoilt medications, used cleaning materials etc. if not managed properly may lead to degradation of natural habitats. • Dust generated from feed grinding, cattle shed cleaning can reduce visibility, cause respiratory problems for local fauna, and facilitate the transport of odours. • Animal carcasses if disposed near natural forest/grassland area may lead to odour problems and may attract scavengers (including vultures in the area). • Use of Non-Steriodal Anti Inflammatory Drug (NSAID) like diclofenac sodium for treatment of cattle may cause mortality of scavengers viz. vultures in the area. • Cattle rearing causes spread of disease (Cattle rearing causes spread of disease to the wild animals | <ul style="list-style-type: none"> ○ The project will not intentionally introduce any new alien species (not currently established in the country or region of the project). ○ The project will implement measures to avoid the potential for accidental or unintended introductions of invasive alien species including the transportation of substrates and vectors. ○ Where alien species are already established in the country or region of the proposed project, the Project will exercise diligence in not spreading them into areas in which they have not already become established. Where feasible, the project will take measures to eradicate such species from the natural habitats over which the project has management control <ul style="list-style-type: none"> • Grazing should not be allowed for project cattle in forest areas. • Collection of fuelwood, fodder etc. for the project should not be allowed from natural forest areas. • Strict no-hunting policy to be implemented. • All solid waste from the project to be collected in designated collection bins and disposed through designated solid waste handlers. • Biomedical waste from the site should be collected and disposed in accordance to the Bio Medical Waste Management Rules, 2016. • Animal carcasses should be buried in order to prevent the spread of disease and odours, and to avoid the attraction of vectors and scavengers. The burial area should have stable, low-permeability soils with sufficient distance from natural forest areas to avoid contamination by vapours or leachate from buried, decaying materials. A dedicated carcass management plan to be included within the site-specific BMP. |

| S No. | Habitats | Baseline Assessment | Impact | Mitigation measures |
|-------|------------------|--|---|--|
| | | | <p>in the area (<i>viz.</i> foot and mouth disease etc.) to the wild animals in the area.</p> | <ul style="list-style-type: none"> • Install dust-collection systems at dusty operations, such as feed grinding; implement fugitive-dust-control measures, such as wetting frequently travelled dirt roads, as necessary. • Nonsteroidal anti-inflammatory drugs (NSAIDs) such as diclofenac should be prohibited. • Vaccination of project livestock as necessary to be conducted to prevent transmission of diseases to live animals • A detailed site-specific BMP to be developed including implementation plan, responsibilities assigned, budget required and timelines. |
| 2 | Aquatic Habitats | <ul style="list-style-type: none"> • Identification of aquatic habitats in the area • Identification of floral and faunal species • Distance of the area from any ecological sensitive areas <i>viz.</i> Key Biodiversity Areas, Ramsar Sites, National Parks, Wildlife Sanctuaries etc (ecologically sensitive areas is the selected states presented in Appendix A). • Distance of the sites from any migratory corridor of aquatic fauna • Identification of IUCN threatened, restricted range, migratory/congregatory aquatic species in the area | <ul style="list-style-type: none"> • Project cattle bathing in waterbodies may cause organic pollution of the water bodies. • Waste released from chilling units if disposed to water bodies may also impact aquatic biodiversity. • Any wastewater discharge from cattle sheds, rearing, milk processing or other processing areas mixed with excreta, urine, waste cattle food, waste milk etc. may reach the nearest waterbody and may increase BOD, suspended solid, turbidity and bacterial load of the water body and lead to organic pollution of the waterbody. • Waste feed, including additives, may contribute to the contamination of stormwater runoff, primarily because of its organic matter content. | <p>Management measures should follow the mitigation hierarchy following avoidance, minimization and mitigation as mentioned below;</p> <ul style="list-style-type: none"> • Prevent project cattle access to surface water bodies using fences, buffer strips or other physical barriers. • Prevent overgrazing of pastureland through use of rotational grazing systems based on seasonal and local ecosystem resilience (e.g. riparian zones) • Use of livestock trails to reduce soil trampling and gully formation / erosion near streams. • Use covered or protected feeders to prevent feed from exposure to rain and wind. • Maintain feeding systems in good working condition to prevent spills and feed contact with the ground. • All runoff/discharge from the site to be diverted to reed beds for treatment of the wastewater streams and prevent contamination of natural surface water bodies. • If required, a portable ETP to be installed for treatment of the effluent post the reed bed treatment to meet the CPCB discharge |

| S No. | Habitats | Baseline Assessment | Impact | Mitigation measures |
|-------|----------|---------------------|--------|--|
| | | | | <p>standards. No runoff/discharge to be released untreated from the site.</p> <ul style="list-style-type: none"> • Animal carcasses burial areas should have stable, low-permeability soils with sufficient distance from natural water bodies to avoid contamination of water bodies. • A detailed site-specific BMP to be developed including implementation plan, responsibilities assigned, budget required and timelines. |

2.2 Impacts to Ecosystem Services

There are four categories of Ecosystem Services defined in Millennium Ecosystem Assessment as outlined in IFC PS 6:

- **Provisioning Services:** These services that can be extracted from ecosystem to support human needs including tangible assets as fresh water, food, fibre, timber and medicinal plants etc.;
- **Regulating Services:** Benefits obtained from an ecosystem's control of the natural environment, including the regulation of surface water purification, carbon storage & sequestration, climate regulation, protection from natural hazard, air quality, erosion and pests etc.;
- **Cultural Services:** Non-material benefits including diverse aspects of aesthetic, spiritual, recreational, and others cultural value; and
- **Supporting Services:** The natural process essential to the maintenance of the integrity, resilience, and functioning of ecosystems, thereby supporting the delivery of all other benefits, including soil formation, nutrient cycling, and primary production.

Impact to ecosystem services and management measures presented in **Table 2.2**.

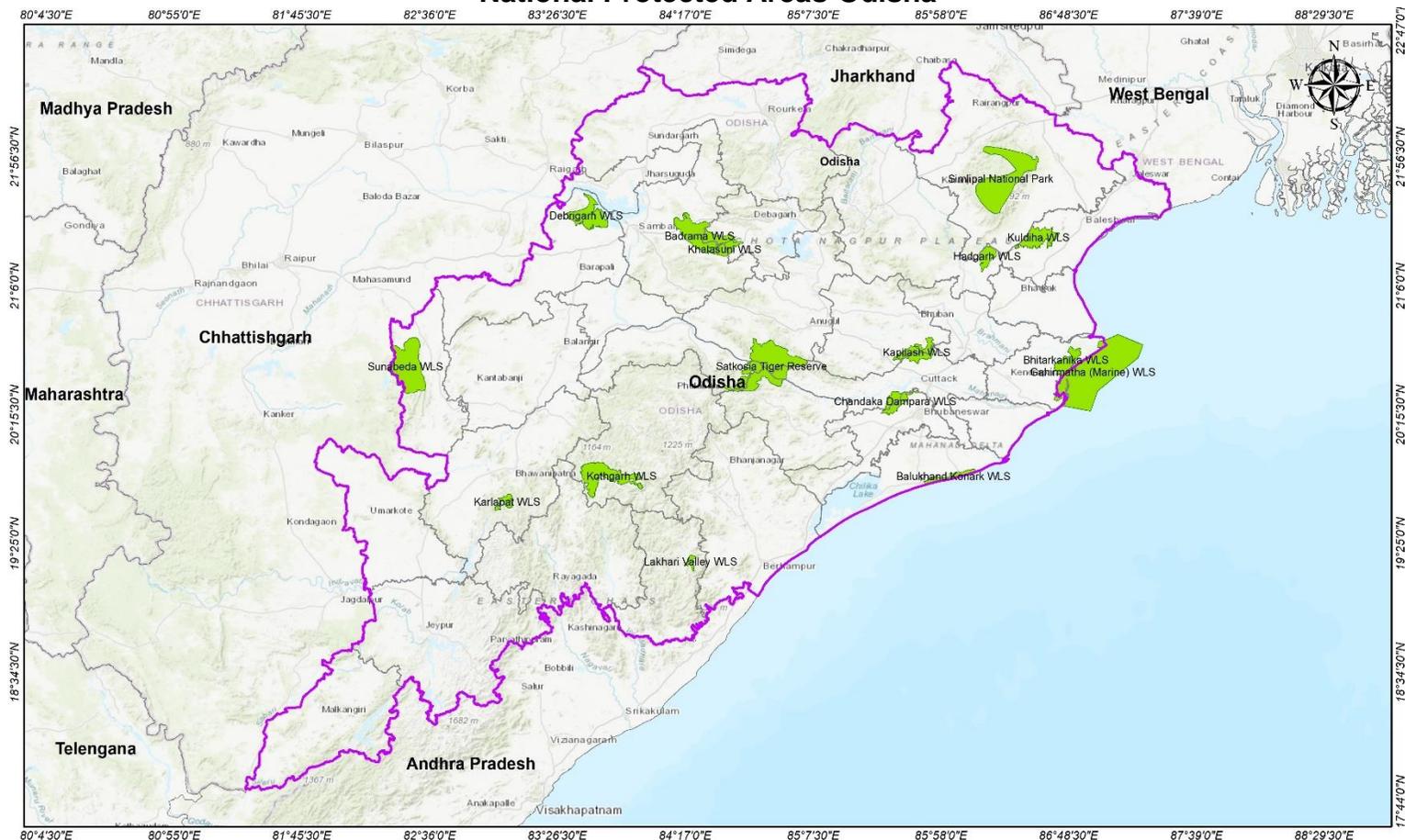
Table 1.4 Impact to Ecosystem services

| S No. | Ecosystem Service | Impact | Mitigation |
|-------|-----------------------|---|--|
| 1 | Provisioning Services | <ul style="list-style-type: none"> Grazing in forest areas may reduce the availability of medicinal plants. Dust pollution generated from the facilities can get deposited on vegetation and cause degradation of forest habitats. Propagation of invasive alien species may happen due to grazing as pollen/seeds may get transported Collection of fuelwood and other non-timber forest produces (NTFPs) by the project workforce may reduce the availability of resources for local people. Wastewater discharge from cattle sheds, rearing, milk processing or other processing areas mixed with excreta, urine, waste cattle food, waste milk etc. may cause pollution of the waterbody and render them unsuitable for the local community. Project cattle bathing in waterbodies may cause pollution of the water bodies. | <ul style="list-style-type: none"> Grazing for project cattle should not be allowed in forest areas. Rotation of grazing to be employed to avoid overgrazing of pastureland. Collection of fuelwood and other NTFPs etc. for the project should not be allowed from natural forest areas. Invasive species management plan should be followed as per the WB ES-6 as mentioned on S No.1 of Table 2.1 Strict no-hunting policy to be implemented Animal carcasses should be buried and the burial area should be distantly located from natural forest areas and local settlements to avoid contamination by vapours or leachate from buried, decaying materials. A dedicated carcass management plan to be included within the site-specific BMP. Install dust-collection systems at dusty operations, such as feed grinding; implement fugitive-dust-control measures, such as wetting frequently travelled dirt roads All runoff/discharge from the site to be treated as mentioned in S No. 2 of Table 2.1 Prevent cattle access to surface water bodies using fences, buffer strips or other physical barriers. |
| 2 | Regulating Services | <ul style="list-style-type: none"> Grazing may increase erosion of soil. Dust generated from the facilities can cause air pollution in the area. Contaminated discharge from project sites can reach surface water bodies and cause surface water pollution. | <ul style="list-style-type: none"> Grazing for the project cattle should not be allowed in forest areas and rotation of grazing to be employed for other areas. Dust collection system to be employed at grinding areas, sprinkling of water as necessary on village roads to restrict fugitive dust generation Reed bed system, and, if required, a portable ETP to be installed for treatment of effluent/runoff from the site to meet the CPCB discharge standards. No wastewater streams to be released untreated from the site. |

| S No. | Ecosystem Service | Impact | Mitigation |
|-------|-------------------|--|---|
| 3 | Cultural Services | <ul style="list-style-type: none"> Construction and operation of a project facility may displace, reduce aesthetics or restrict access to any religious structures, burial grounds, sacred trees, sacred grooves etc. Unscientific solid waste, animal carcass disposal from the project area may reduce aesthetic value of an area. Dust, odour generated from cattle sheds, milk processing unit likely to reduce the aesthetic value of an area. Contaminated discharge from project sites can cause surface water pollution and reduce aesthetic, recreational and cultural value of the surface water body. Project cattle bathing in waterbodies may cause pollution of the water bodies. | <ul style="list-style-type: none"> Prevent project cattle access to surface water bodies using fences, buffer strips or other physical barriers. Prior to site selection, screening to be conducted and project sites to be located away from any religious or cultural areas and care should be taken so that access to the local religious or cultural areas are not blocked by the project facilities. Solid waste management plan to be implemented at site for scientific management of solid wastes. Animal carcass to be buried at designated areas away from any habitation, religious and cultural areas. Reed bed system, and, if required, a portable ETP to be installed for treatment of effluent/runoff from the site to meet the CPCB discharge standards. No wastewater streams to be released untreated from the site Prevent cattle access to surface water bodies using fences, buffer strips or other physical barriers. |
| 4 | Support Services | <p>Grazing at forest and grassland areas will reduce the productivity of the area, increase soil erosion etc.</p> <p>Air, noise, soil pollution from the project facilities as mentioned earlier and can cause adverse effects on the functioning of terrestrial and aquatic ecosystems.</p> <p>Water pollution from project operation have the potential to reduce/increase primary production of water bodies.</p> | Similar as mentioned for "provisioning services". |

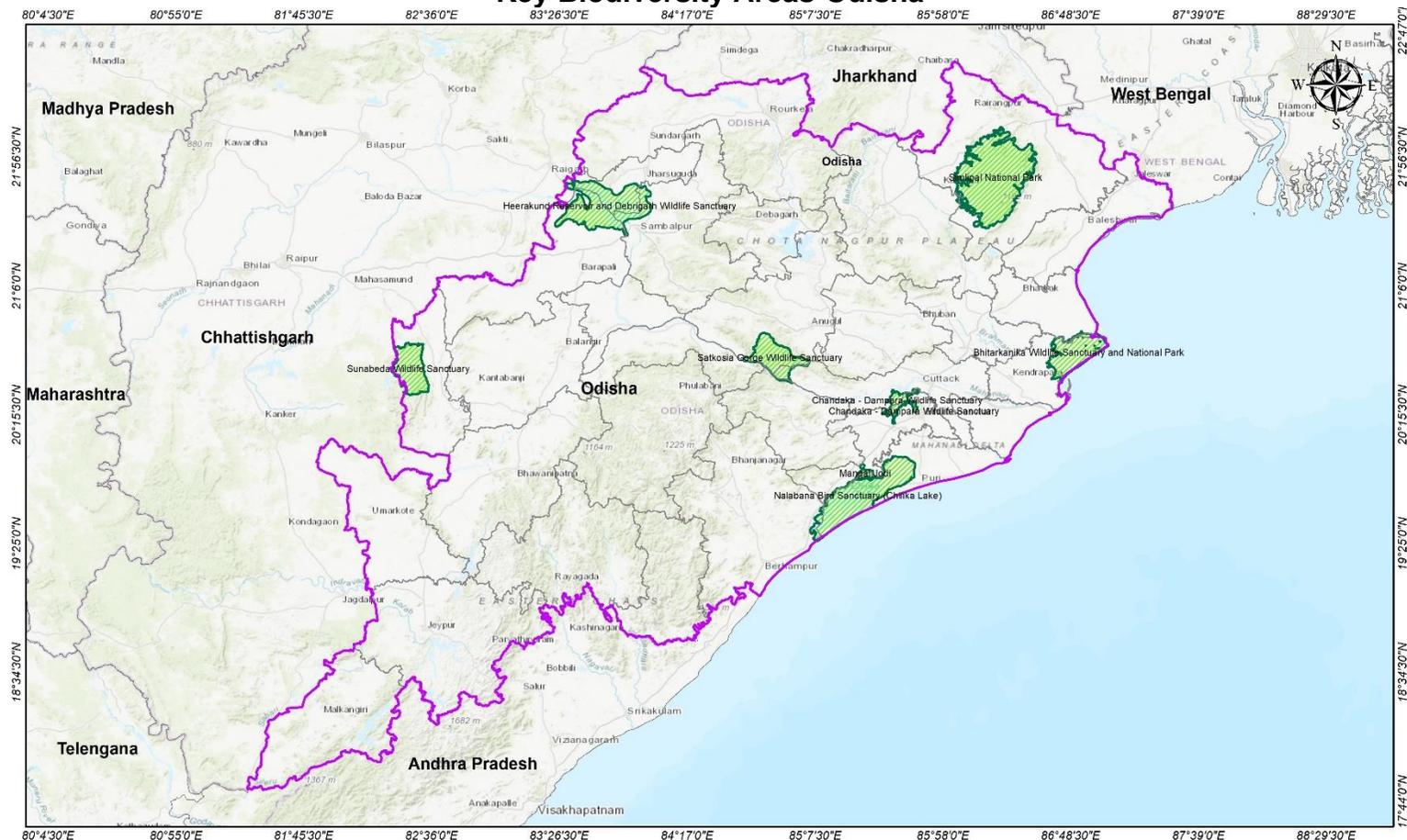
Annexure A ECOLOGICALLY SENSITIVE AREAS IN SELECTED STATES

National Protected Areas-Odisha



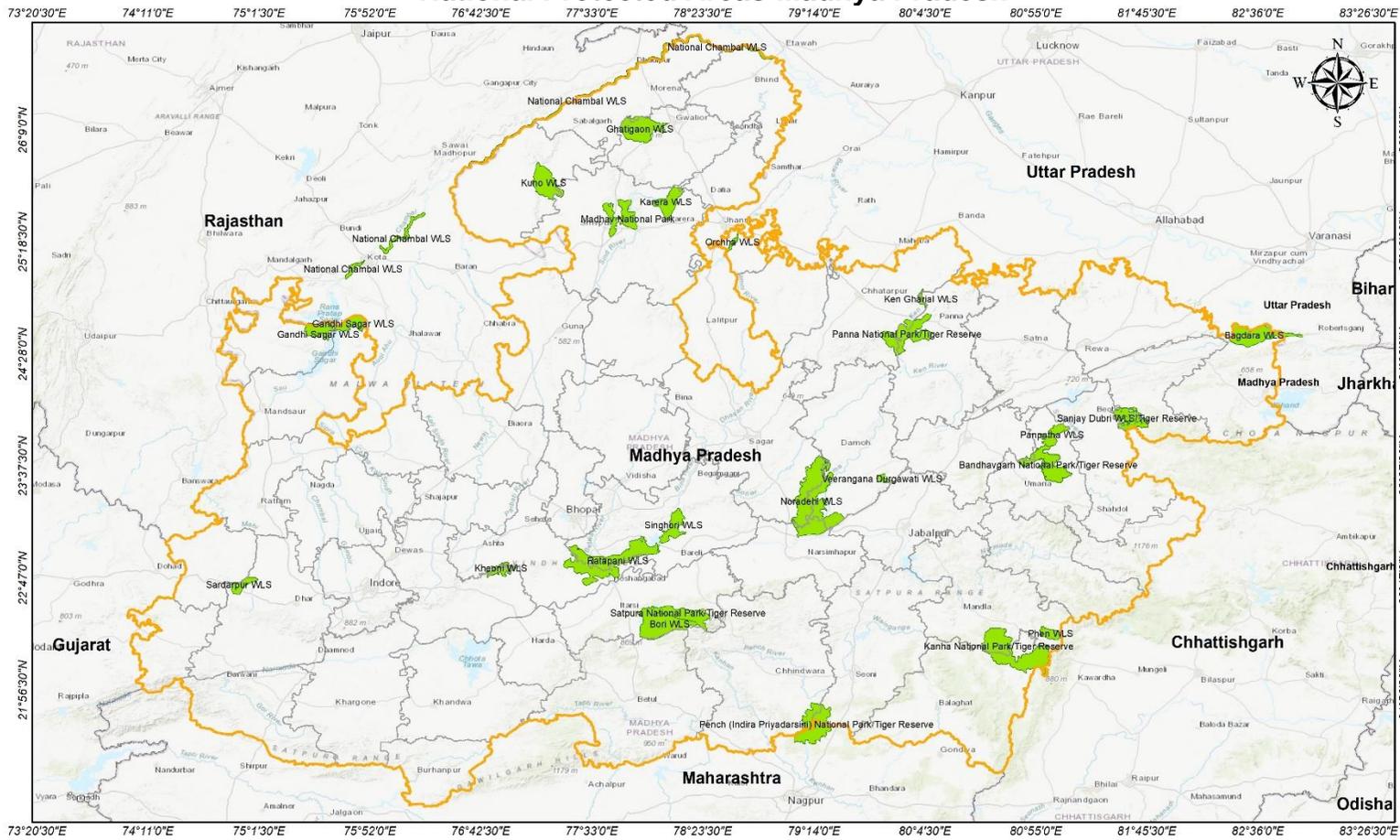
| | | |
|--|--|---|
| <p>Legend</p> <ul style="list-style-type: none"> Odisha Protected Area | <p>Protected Area of Odisha</p> <p>Scale:</p> <p>Kilometers</p> | <p>Data Source:</p> <p>Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</p>  |
|--|--|---|

Key Biodiversity Areas-Odisha



| | | |
|---|--|--|
| <p>Legend</p> <ul style="list-style-type: none"> Odisha Key Biodiversity Areas (KBA) | <p>Key Biodiversity Areas (KBA) of Odisha</p> <p>Scale:</p> <p>Kilometers</p> | <p>Data Source:</p> <p><small>Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</small></p> |
|---|--|--|

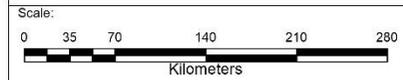
National Protected Areas-Madhya Pradesh



Legend

- Madhya Pradesh
- Protected Area

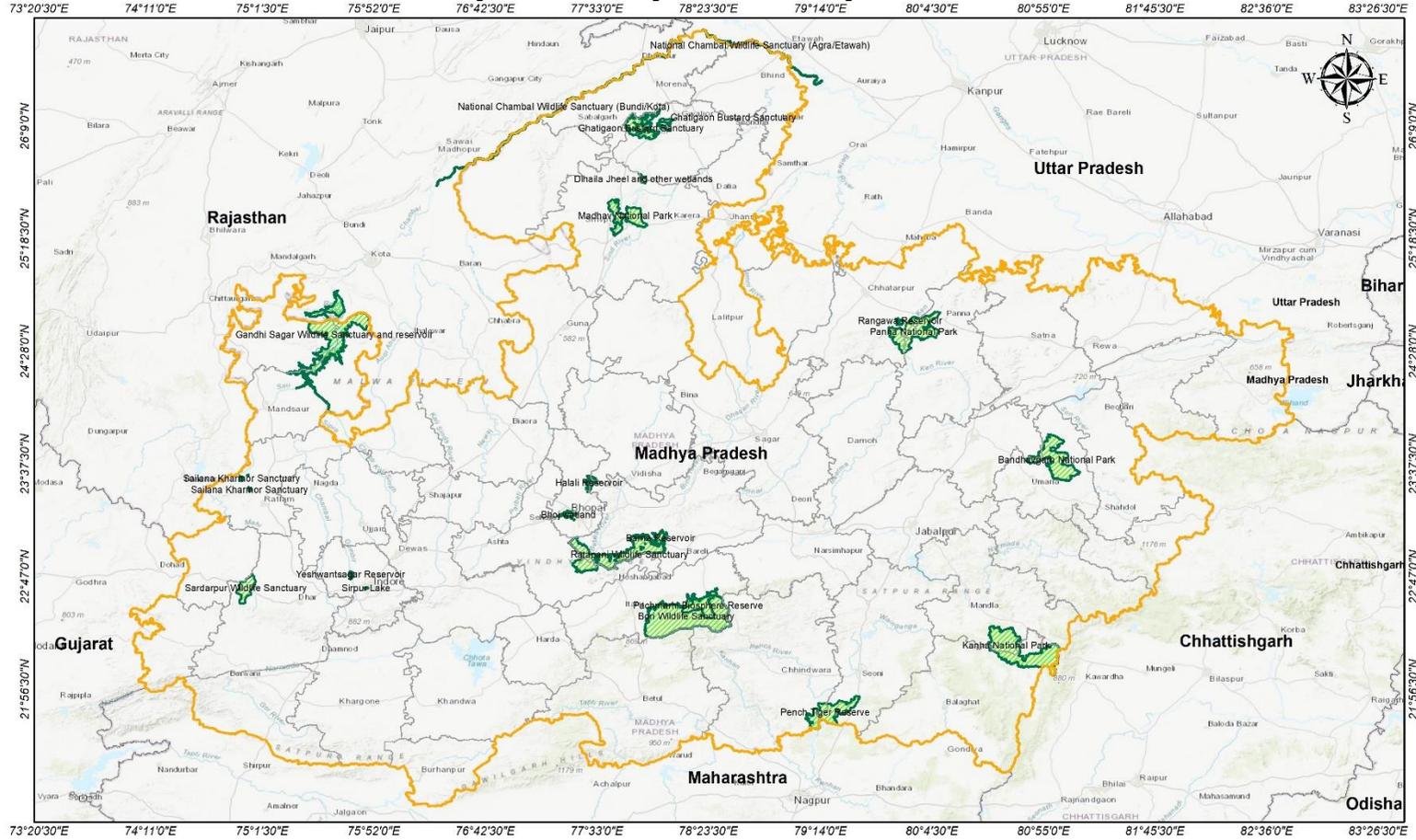
Protected Area of Madhya Pradesh



Data Source:
 Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



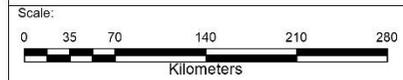
Key Biodiversity Areas-Madhya Pradesh



Legend

- Madhya Pradesh
- Key Biodiversity Areas (KBA)

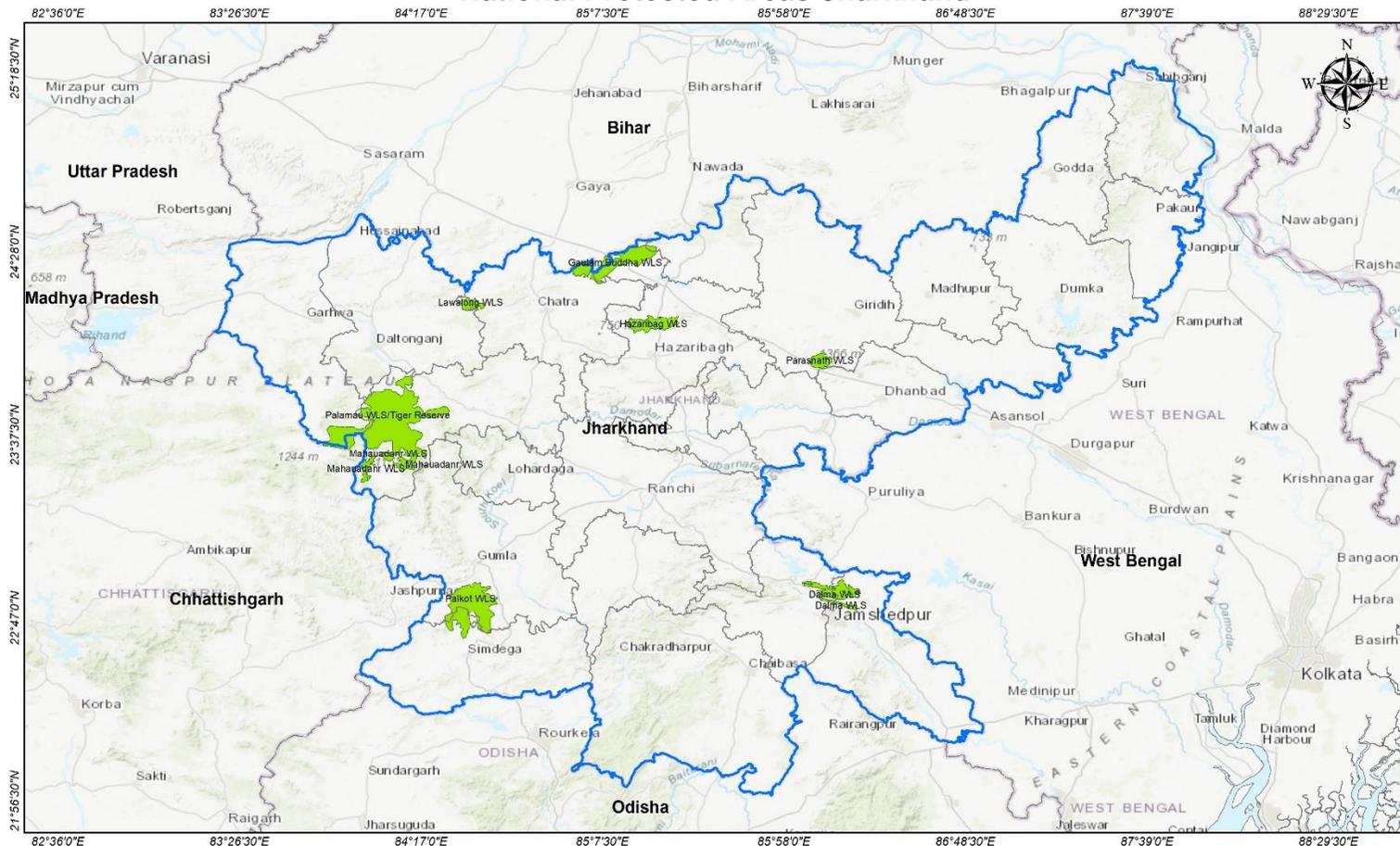
Key Biodiversity Areas (KBA) of Madhya Pradesh



Data Source:
 Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

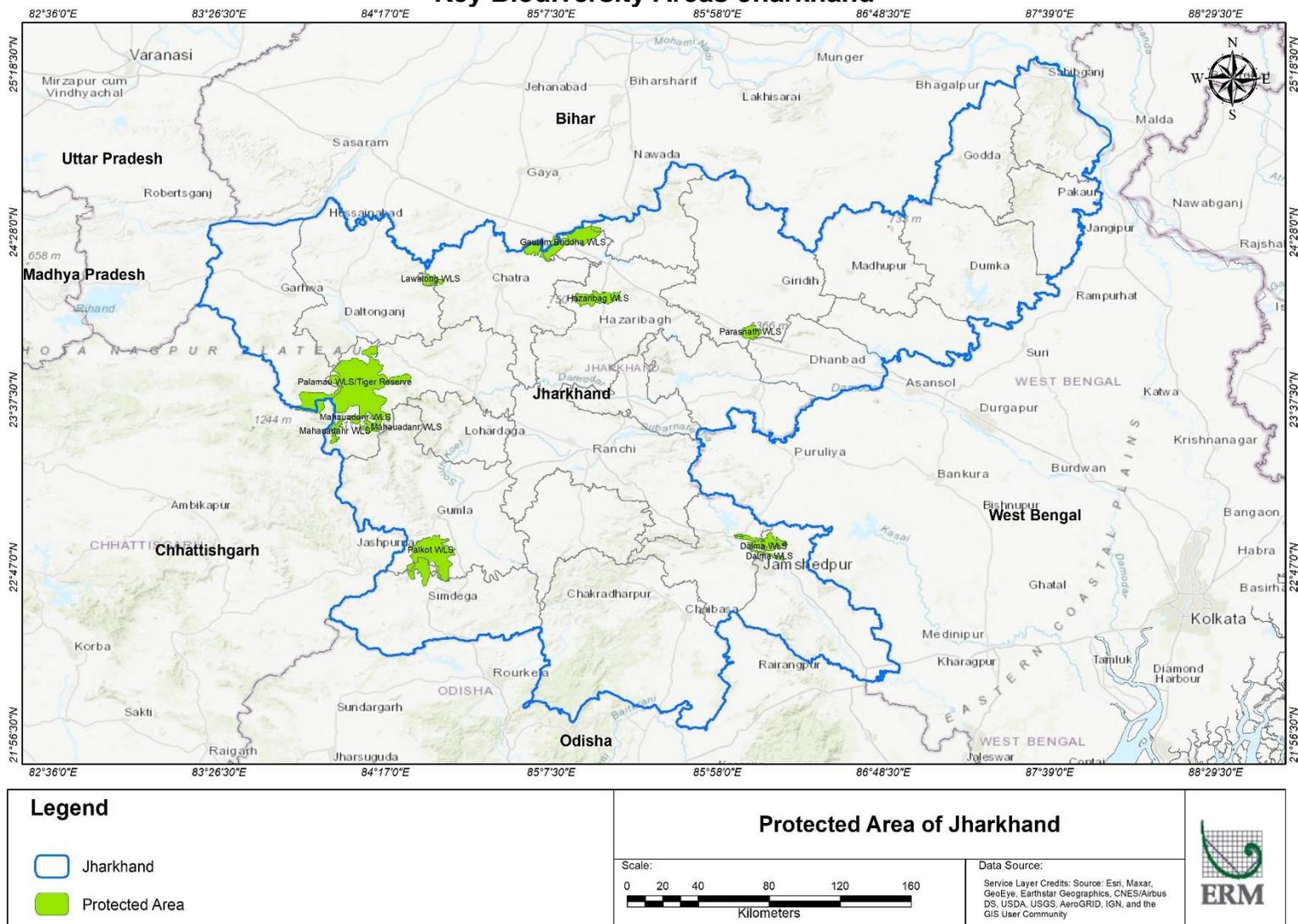


National Protected Areas-Jharkhand

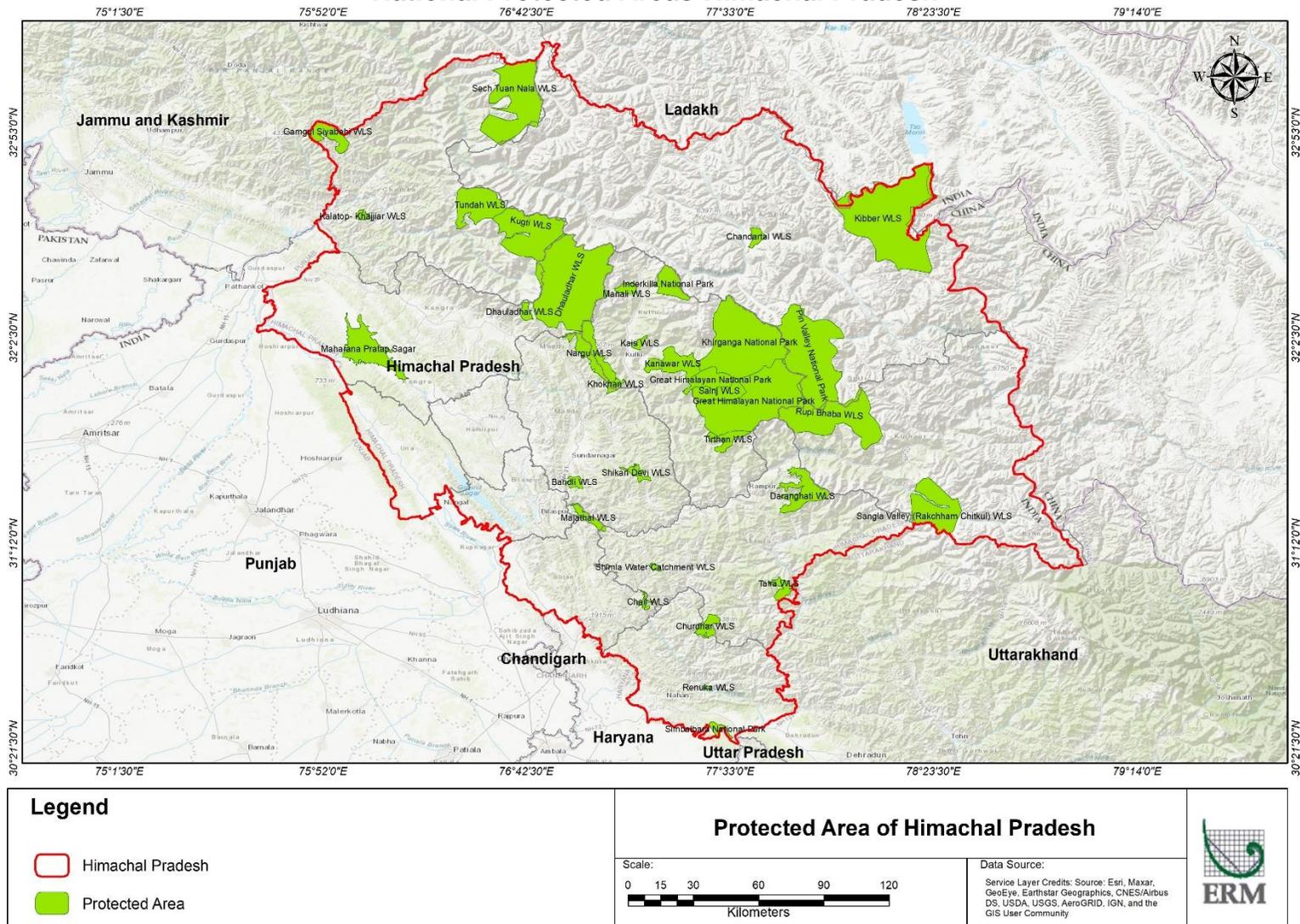


| | | |
|---|--|---|
| <p>Legend</p> <ul style="list-style-type: none"> Jharkhand Protected Area | <p>Protected Area of Jharkhand</p> <p>Scale:</p> <p>0 20 40 80 120 160 Kilometers</p> | <p>Data Source:</p> <p>Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</p>  |
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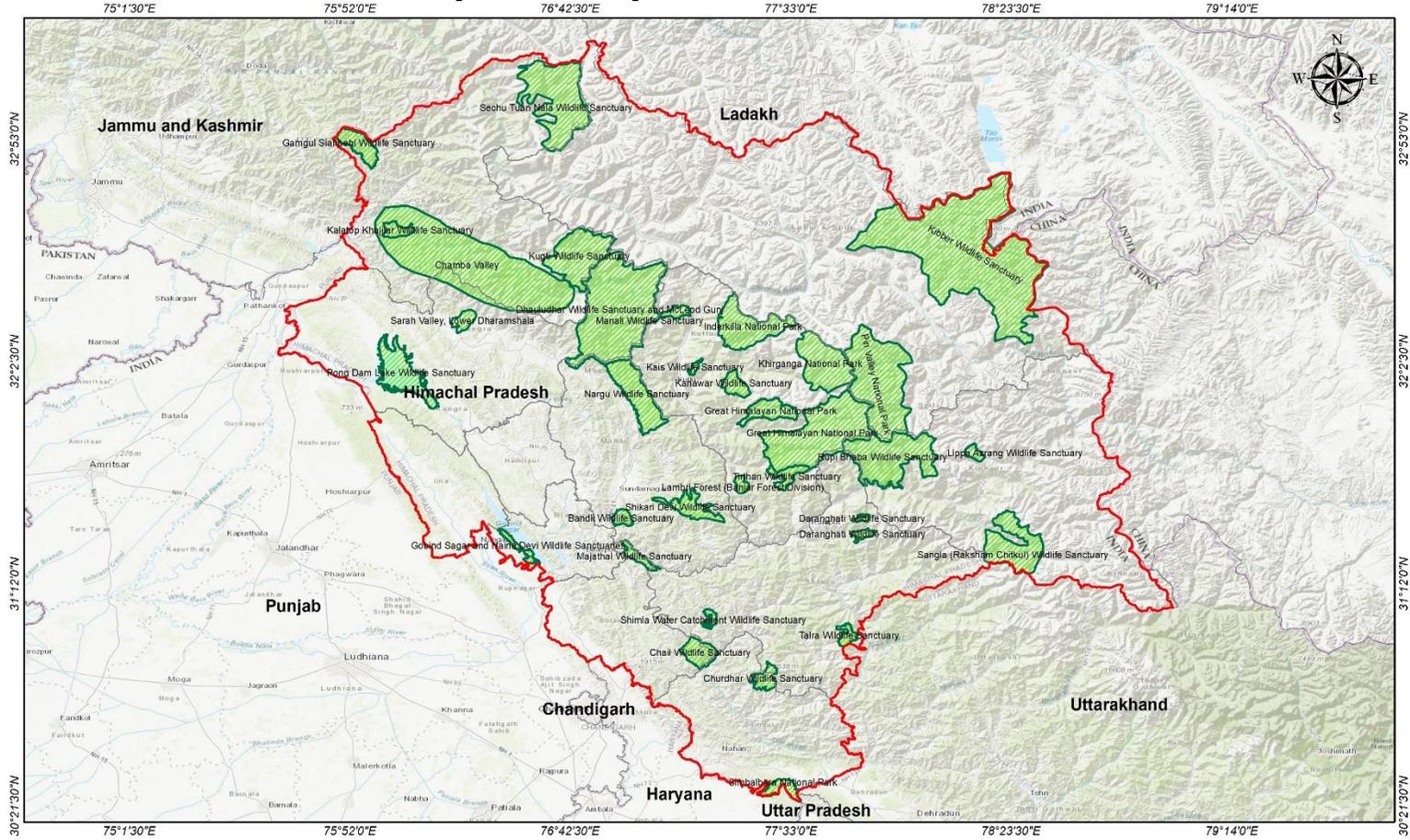
Key Biodiversity Areas-Jharkhand



National Protected Areas-Himachal Pradesh

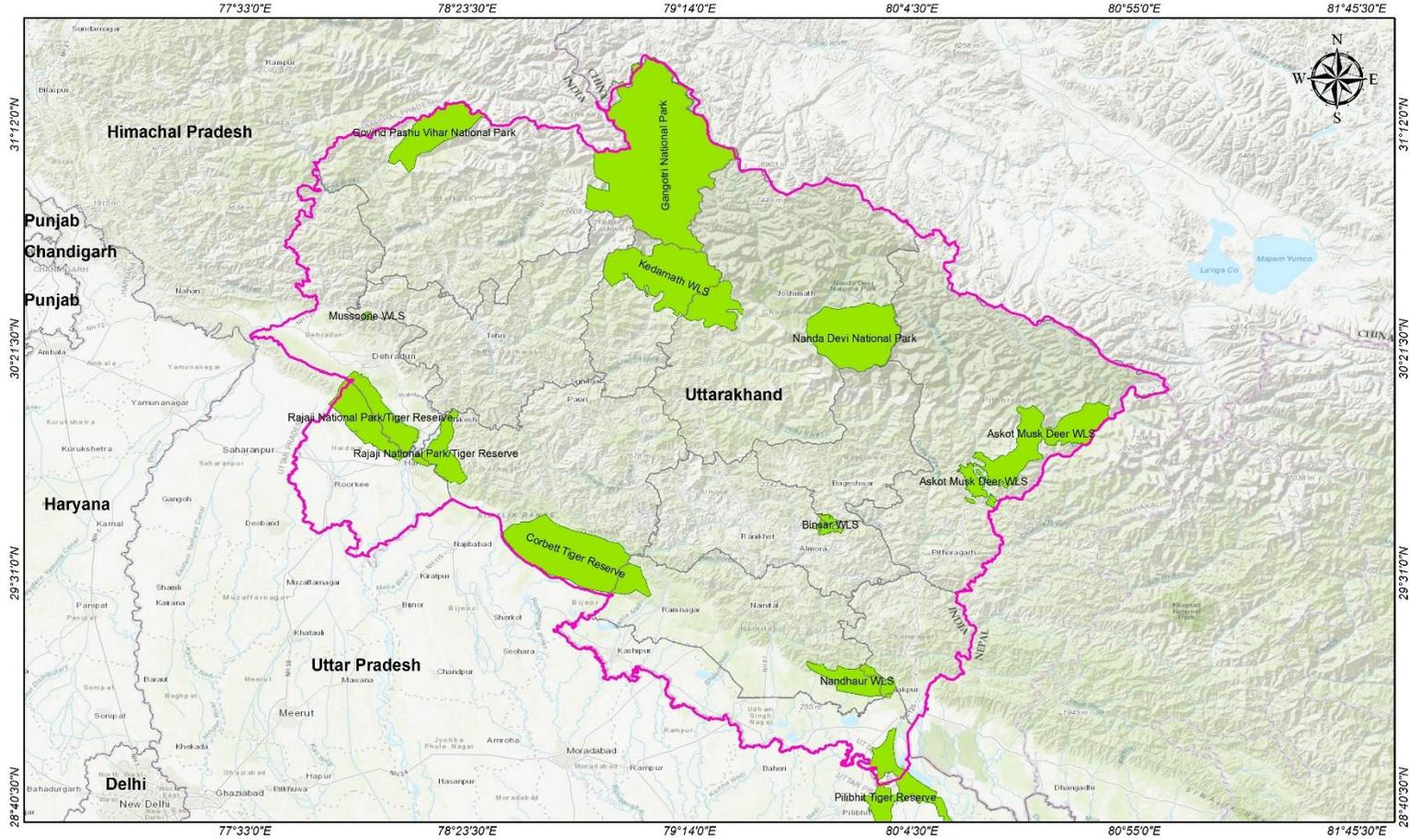


Key Biodiversity Areas-Himachal Pradesh



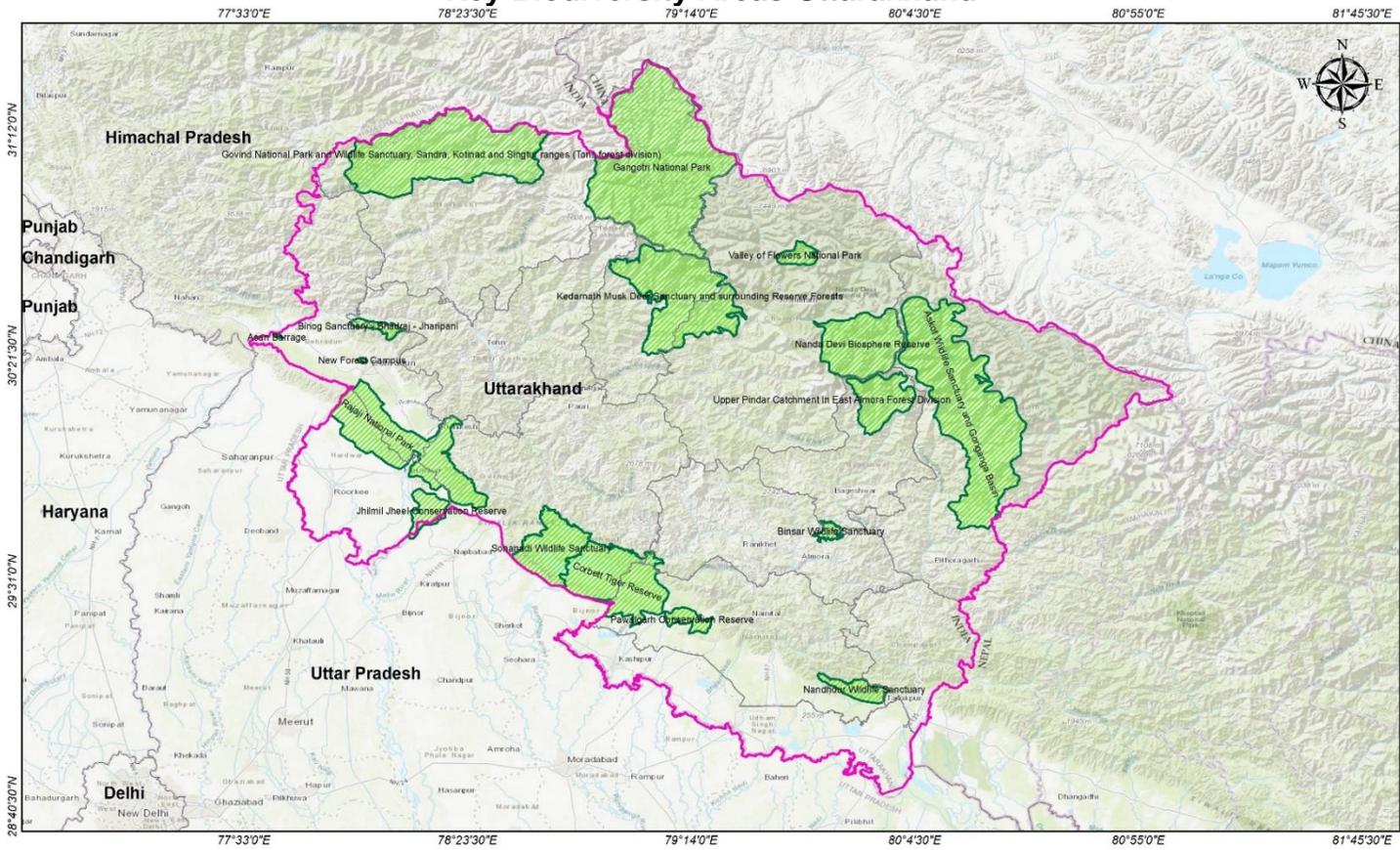
| | | |
|--|---|---|
| <p>Legend</p> <ul style="list-style-type: none"> Himachal Pradesh Key Biodiversity Areas (KBA) | <p align="center">Key Biodiversity Areas (KBA) of Himachal Pradesh</p> <p>Scale:</p> <p>0 15 30 60 90 120</p>  <p align="center">Kilometers</p> | <p>Data Source:</p> <p>Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</p>  |
|--|---|---|

National Protected Areas-Uttarakhand



| | | |
|--|---|---|
| <p>Legend</p> <ul style="list-style-type: none"> Uttarakhand Protected Area | <p>Protected Area of Uttarakhand</p> <p>Scale:</p> <p>Kilometers</p> | <p>Data Source:</p> <p>Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</p>  |
|--|---|---|

Key Biodiversity Areas-Uttarakhand



| | | |
|--|---|---|
| <p>Legend</p> <ul style="list-style-type: none"> Uttarakhand Key Biodiversity Areas (KBA) | <p>Key Biodiversity Areas (KBA) of Uttarakhand</p> <p>Scale:</p> <p>Kilometers</p> | <p>Data Source:</p> <p>Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</p> |
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APPENDIX N: WASTE WATER TREATMENT PLAN

1. INTRODUCTION

1.1 Wastewater Management Context

Water is primarily treated as raw material in the processing of milk, which is used in cleaning, washing, disinfection, cooling, ancillary operations like heat transfer etc. Milk and dairy product industry are examples of industrial effluent sources that pollute natural aquatic habitats significantly. The environment is impacted at every step of the dairy supply chain, including production, processing, packaging, shipping, storage, distribution, and marketing. The processes generate wastes of varying quality and quantity, which, if not managed, could result in increasing disposal and serious environmental issues.

1.2 Objectives

Following are the objectives of this procedure.

- Identifying the source of effluents or wastewater and associated risks throughout the dairy supply chain;
- Understanding the likelihood and magnitude of environmental, health and safety risks based on the nature of the project activities, such as whether the project will generate significant quantities of effluents;
- Implementation of wastewater management procedure during the project implementation.

1.3 Regulatory Framework and Safeguards

Relevant provisions under the following regulations, guidelines and pertinent standards are applicable towards the implementation of this wastewater management procedure.

Table 1-1: Applicable Regulation & Guidelines

| Law | Description |
|---|---|
| Environment (Protection) Rules, 1986 | This Act provides for environmental protection and improvement, applies to different types of environmental pollution, including water pollution. |
| IFC General EHS Guidelines: Occupational Health and Safety | This guideline provides guidance and example of reasonable precautions to implement in managing principal risks to occupational health and safety. |
| IFC Environmental, Health, and Safety Guidelines for Dairy Processing | This guideline provides dairy sector specific EHS guidelines applicable to reception, storage, and industrial processing of raw milk and the handling and storage of processed milk and dairy products. |

2. POTENTIAL IMPACTS

Producer's owned Organisations (POIs), pasteurization units, milk processing plants, and seed processing plants must take all reasonably practicable steps to manage the wastewater generated from the respective facilities to provide and maintain a safe and healthy working environment. The dairy processing activities involve milk storage, milk fat separation and standardization, pasteurization, milk skimming, and production of cheese, butter, and other milk products etc. The wastewaters produced by this sector contain significant amounts of nutrients, chemical oxygen demand (COD), biological oxygen demand (BOD), total suspended solids (TSS), and organic and inorganic substances, which, if not properly handled, can create serious environmental problems.

2.1 Potential impact on soil, ground water and surface water quality

Wastewater generated from dairy processing operations have organic components classified as proteins, lactose, and fat etc. These compounds affect the environment in different ways depending on their solubility and biodegradability. Dairy wastewater discharged in the waterbody increases the BOD level and promotes growth of Sewage Fungus. Nitrogen, Phosphorus, Sodium and other elements may present the dairy wastewater which will get absorbed in soil if treated in soil, however leaching of elements in soil is very slow thus a groundwater contamination problem can be struck out.

2.2 Potential impact on landscape and aesthetics

Wastewater or effluents may only cause degradation in the aesthetics and landscape value of an area.

2.3 Potential impact on occupational and community health

Each employer must establish and maintain effective methods for:

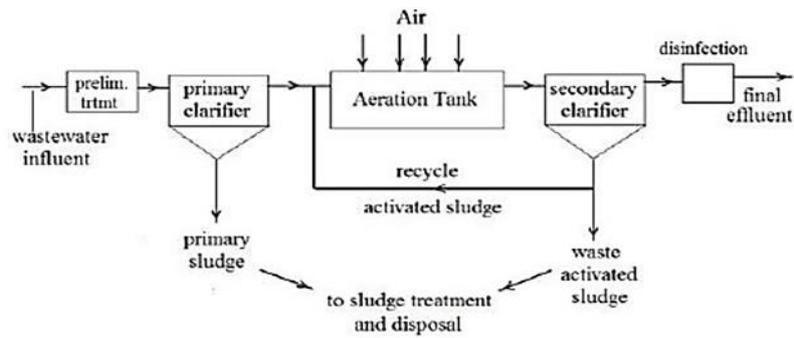
- Understand the quality, quantity, frequency, and sources of liquid effluents in its installations. This includes knowledge about the locations, routes and integrity of internal drainage systems and discharge points
- Plan and implement the segregation of liquid effluents principally along industrial, utility, sanitary, and stormwater categories, to limit the volume of water requiring specialized treatment.
- Identify opportunities to prevent or reduce wastewater pollution through such measures as recycle/reuse within their facility, input substitution, or process modification (e.g. change of technology or operating conditions/modes).
- Assess compliance of their wastewater discharges with the applicable: (i) discharge standard (if the wastewater is discharged to a surface water or sewer), and (ii) water quality standard for a specific reuse (e.g. if the wastewater is reused for irrigation).

2.4 General Dairy Wastewater Treatment Process

A series of steps are followed at the dairy wastewater treatment plant:

- The pH level is initially brought to 8.5 using pH controllers such as caustic or acid. Any emulsions are then broken down and solids precipitated with the help of a de-emulsifier.
- Flocculation and Dissolved Air Flotation are two more crucial processes in the dairy wastewater treatment process. The wastewater is flocculated and then pumped into a slow mix zone, where the particles are clumped together into larger ones before being treated with the air flotation procedure.
- The air flotation system bubbles are driven from a Recycle Air Dissolving system that blows the treated effluent into the air flotation system.
- The sludge is then run through the filter press and disposed of in accordance with environmental requirements.

Figure 1-1: A schematic diagram of dairy wastewater treatment plant



3. MANAGEMENT PLAN

Each employer must apply prevention and control measures to control hazards which are identified and assessed as posing a threat to the environment and where practicable, the hazard shall be eliminated. The following preventive and protective measures must be implemented in order of priority.

Table 1-2: Identified Wastewater Hazards

| S. No. | Sub-component reference and proposed activity | Stages | Description of Hazard | Control Method |
|--------|---|--------------------|--|--|
| 1. | B.1 - Strengthening village level milk chilling infrastructures | Construction Stage | <ul style="list-style-type: none"> ■ Construction sediment generation and Soil erosion ■ During the construction period sediment will generate from various construction activities will result in polluting the nearby surface water body or stream. Also, rainfall during the construction period resulting in soil erosion. | <ul style="list-style-type: none"> ■ Bunds shall be constructed around storage areas to avoid any carry-away of construction materials. |
| | | Operational stage | <ul style="list-style-type: none"> ■ Daily operations at BMC includes collection of milk coming from milk pooling points (MPPs), storage of milk in insulated chambers and unloading the milk in milk tanker to send to the processing plant. These activities need daily cleaning of milk can and vessels resulting in generation of wastewater. | <ul style="list-style-type: none"> ■ As no harmful chemicals are being used in the cleaning process, the wastewater can be disposed in soak pits. BMC operator should ensure preparation of soak pit with adequate depth based on the daily wastewater generation. |
| 2. | B.1 - Community Milking Centres | Construction Stage | <ul style="list-style-type: none"> ■ Refer Sl. No - 1 | <ul style="list-style-type: none"> ■ Refer Sl. No - 1 |
| | | Operational stage | <ul style="list-style-type: none"> ■ Daily operations at community milking centre includes washing of animals, washing of floors, milking of cattle and waste/ wastewater management. ■ Based on the area covered by the centre the stormwater volume can be calculated which need to be managed. | <ul style="list-style-type: none"> ■ As no harmful chemicals are being used in the cleaning process, the wastewater can be disposed in soak pits. community milking centre operator should ensure preparation of soak pit with adequate depth based on the daily wastewater generation. ■ If developed the stormwater can be channelized to rainwater harvesting system, otherwise it should be directed towards a natural stream. |
| | | Construction Stage | <ul style="list-style-type: none"> ■ Refer Sl. No - 1 | <ul style="list-style-type: none"> ■ Refer Sl. No - 1 |

| S. No. | Sub-component reference and proposed activity | Stages | Description of Hazard | Control Method |
|--------|---|--------------------|---|---|
| 3. | B.1 - Village level Milk Pasteurization and Product Manufacturing | Operational stage | <ul style="list-style-type: none"> Industrial wastewater generated from milk processing operations includes process wastewater, wastewater from utility operations, and miscellaneous activities including wastewater from laboratories, equipment maintenance shops, etc. The pollutants in an industrial wastewater may include acids or bases (exhibited as low or high pH), soluble organic chemicals causing depletion of dissolved oxygen, suspended solids, nutrients (phosphorus, nitrogen), heavy metals (e.g. cadmium, chromium, copper, lead, mercury, nickel, zinc), cyanide, toxic organic chemicals, oily materials, and volatile materials., as well as from thermal characteristics of the discharge (e.g., elevated temperature). | <ul style="list-style-type: none"> Stormwater should be separated from process and sanitary wastewater streams to reduce the volume of wastewater to be treated prior to discharge. If sewage from the industrial facility is to be discharged to surface water, treatment to meet national or local standards for sanitary wastewater discharges or, in their absence, the indicative guideline values applicable to sanitary wastewater discharges shown in Appendix – I. Sludge from sanitary wastewater treatment systems should be disposed in compliance with local regulatory requirements, in the absence of which disposal has to be consistent with protection of public health and safety, and conservation and long-term sustainability of water and land resources. |
| 4. | B.2 - Installation of milk and milk products booths/ parlours/ kiosks | Construction Stage | <ul style="list-style-type: none"> Refer SI. No. 1 | <ul style="list-style-type: none"> Refer SI. No. 1 |
| | | Operational stage | <ul style="list-style-type: none"> At the booth or parlours people will visit to purchase the milk and milk products. Any COVID-19 affected person can infect the booth operator or other consumer resulting in the spread of disease. | <ul style="list-style-type: none"> Maintain COVID-19 protocol and guidelines released by the government to minimises the chance of infection and prevent the spread of the disease. |
| 5. | B.3 - Dairy Plant Improvement | Construction Stage | <ul style="list-style-type: none"> Refer SI. No. 1 | <ul style="list-style-type: none"> Refer SI. No. 1 |
| | | Operational stage | <ul style="list-style-type: none"> Refer SI. No. 3 | <ul style="list-style-type: none"> Refer SI. No. 3 |

| S. No. | Sub-component reference and proposed activity | Stages | Description of Hazard | Control Method |
|--------|--|--------------------|---|--|
| | | | | <ul style="list-style-type: none"> The plant should instal the effluent treatment plant (ETP) to treat the waste water (pH, TDS,COD, oil & grease and SVI) generated the dairy unit and meet the CPCB discharge standard. |
| 6. | C.1 - Calf Rearing Centre | Construction Stage | <ul style="list-style-type: none"> Refer SI. No. 1 | <ul style="list-style-type: none"> Refer SI. No. 1 |
| | | Operational stage | <ul style="list-style-type: none"> Refer SI. No. 2 | <ul style="list-style-type: none"> Refer SI. No. 2 |
| 7. | C.2 - Setting up of Fodder Seed Processing Plant | Construction Stage | <ul style="list-style-type: none"> Refer SI. No. 1 | <ul style="list-style-type: none"> Refer SI. No. 1 |
| | | Operational stage | <ul style="list-style-type: none"> Refer SI. No. 2 | <ul style="list-style-type: none"> Refer SI. No. 2 |

A wastewater and water quality monitoring program with adequate resources and management oversight should be developed and implemented to meet the objective(s) of the monitoring program. The wastewater and water quality monitoring program should consider the following elements:

- Monitoring Parameters - The parameters selected for monitoring should be indicative of the pollutants of concern from the process and should include parameters that are regulated under compliance requirements.
- Monitoring type and frequency - Wastewater monitoring should take into consideration the discharge characteristics from the process over time. Effluents from highly variable processes may need to be sampled more frequently or through composite methods. Grab samples or, if automated equipment permits, composite samples may offer more insight on average concentrations of pollutants over a 24-hour period.
- Monitoring locations - The monitoring location should be selected with the objective of providing representative monitoring data. Effluent sampling stations may be located at the final discharge, as well as at strategic upstream points prior to merging of different discharges. Process discharges should not be diluted prior or after treatment with the objective of meeting the discharge or ambient water quality standards. and
- Data quality - Monitoring programs should apply internationally approved methods for sample collection, preservation, and analysis. Sampling should be conducted by or under the supervision of trained individuals. Analysis should be conducted by entities permitted or certified for this purpose. Sampling and Analysis Quality Assurance/Quality Control (QA/QC) plans should be prepared and implemented. QA/QC documentation should be included in monitoring reports.

4. IMPLEMENTATION ARRANGEMENTS

4.1 Roles and Responsibilities

The PMU-NDDDB will be responsible for the operationalization and overall implementation of this WWMP. PMU-NDDDB will have a dedicated Environment and Social (E&S) Cell, who will act as Nodal Officer for implementation of E&S management system. E&S Cell will seek WWMP implementation update on predefined KPIs from POIs of respective states in the monthly, quarterly and annual project implementation update report.

Table 1-3 Roles and Responsibilities for SEP Implementation

| S. No | Entity | Responsibility in SEP implementation |
|-------|--|--|
| 1 | E&S Cell, NDDDB | <ul style="list-style-type: none"> ■ Nodal agency for implementing E&S action plan including WWMP implementation; ■ Updating WWMP on regular basis based on feedback received from line agencies like CPSC, PFC, SLTMC, POIs ■ Supervision of WWMP implementation by POIs |
| 2 | State Level Technical Management Committee (SLTMC) | <ul style="list-style-type: none"> ■ Monitor WWMP implementation by respective POIs of the state; ■ Provide feedback to NDDDB on WWMP related matters, including periodic data on implementation |
| 3 | State Federation | <ul style="list-style-type: none"> ■ Monitor WMP implementation by respective POIs of the state; ■ Provide feedback to NDDDB on WWMP related matters. |

| S. No | Entity | Responsibility in SEP implementation |
|-------|--|--|
| 4 | Other POIs (Milk Union, Milk Producer Companies, FPO etc.) | <ul style="list-style-type: none"> ■ Implement actions as proposed in WWMP with the guidance from NDDB; ■ Maintain records of monitoring at their offices. |

4.2 Training on WWMP implementation

Sufficient training needs to be provided to all personnel. The scope of the training will ensure that workers are able to fulfil their waste water management roles and functions through awareness on relevant aspects of this plan, related legislation and standards and general waste management practices (tidiness, waste segregation, etc.). Training details (e.g. participants, subjects, training hours provided, etc.) will be recorded.

4.3 Monitoring and Reporting

Performance of POIs on WWMP implementation will be assessed based on following monitoring and reporting activities.

- Periodical site inspection and visual observation;
- Monthly inspection report to State Federation

ANNEXURE 1:

WASTEWATER GENERATION AND MANAGEMENT CHECKLIST

| Water Usage, Wastewater Generation and Management | | | | |
|---|--|--|---|---|
| Source of water for domestic purposes | <input type="checkbox"/> Municipal supply | <input type="checkbox"/> Tanker Water Supply | <input type="checkbox"/> Borewell/ Dug Well If yes, location of well Latitude: Longitude: | Status of permit for the borewell <input type="checkbox"/> Available and valid <input type="checkbox"/> Available but expired <input type="checkbox"/> In the process of renewal <input type="checkbox"/> Not available |
| Water consumption for domestic purposes, KL | | | | |
| Mechanism for wastewater management | <input type="checkbox"/> Soak Pit/ Septic Tank | | <input type="checkbox"/> Packaged STP at Site <input type="checkbox"/> ETP at Site | |
| Date of cleaning of soak pit/ septic tank | Click or tap to enter a date. | | | |
| Soak pit/ septic tank cleaned by | Name of the agency | | | |
| Source of water for Industrial purposes | <input type="checkbox"/> Municipal supply | <input type="checkbox"/> Tanker Water Supply | <input type="checkbox"/> Borewell/ Dug Well If yes, location of well Latitude: Longitude: | Status of permit for the borewell <input type="checkbox"/> Available and valid <input type="checkbox"/> Available but expired <input type="checkbox"/> In the process of renewal <input type="checkbox"/> Not available |
| Water consumption for construction purposes, KL | | | | |
| Source of water for drinking purposes | <input type="checkbox"/> Municipal supply | <input type="checkbox"/> Packaged drinking water bottles | <input type="checkbox"/> Borewell/ Dug Well If yes, location of well Latitude: Longitude: Status of permit for the borewell <input type="checkbox"/> Available and valid <input type="checkbox"/> Available but expired <input type="checkbox"/> In the process of renewal <input type="checkbox"/> Not available | <input type="checkbox"/> Workers carrying it from their residences |
| Water consumption for drinking purposes, KL | | | | |

ANNEXURE 2: RUNOFF MANAGEMENT CHECKLIST

| Runoff Management | | | |
|---|---|--|---|
| Runoff drainage channel developed to manage storm water | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |
| Does site have hazardous waste storage areas | <input type="checkbox"/> Yes <input type="checkbox"/> No | If yes, weather it avoided during development of runoff drainage channel | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Does site have hazardous chemical storage areas | <input type="checkbox"/> Yes <input type="checkbox"/> No | If yes, weather it avoided during development of runoff drainage channel | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Any incident of spillage recorded in hazardous chemical storage areas | <input type="checkbox"/> Yes <input type="checkbox"/> No | If yes, please refer Contaminated Material and Site Management Plan | |

ANNEXURE 3: INDICATIVE VALUES FOR TREATED SANITARY SEWAGE DISCHARGES

Indicative Values for Treated Sanitary Sewage Discharges³⁹

| SI No | Pollutants | Units | Guideline Value |
|-------|-------------------------|--------------------------|-----------------|
| 1. | pH | pH | 6-9 |
| 2. | BOD | mg/l | 30 |
| 3. | COD | mg/l | 125 |
| 4. | Total nitrogen | mg/l | 10 |
| 5. | Total phosphorus | mg/l | 2 |
| 6. | Oil and grease | mg/l | 10 |
| 7. | Total suspended solids | mg/l | 50 |
| 8. | Total coliform bacteria | MPN ⁴⁰ /100ml | 400 |

³⁹ IFC General EHS Guidelines

⁴⁰ Most Potable Number

APPENDIX O: OCCUPATIONAL AND COMMUNITY HEALTH & SAFETY MANAGEMENT PLAN

1. INTRODUCTION

1.1 Objectives

This Occupational Health and Safety Plan address the various sub-activities under the NDSP II under the WB funding scope. This management plan has been developed to outline the POI's approach to managing worker's health and safety. The key reference document for this Guideline is the World Bank Group's *Environmental, Health, and Safety (EHS) Guidelines* (April 2007)⁴¹ together with the relevant Industry Sector EHS Guidelines available at www.ifc.org/ehsguidelines.

Key objectives are:

- Key principles involved in ensuring the health and safety of workers and the community is protected.
- Preparation of Health and Safety Management Plan and associated Job Safety Analyses (JSA); and
- Implementation of Health and Safety Management Plan and JSA during project implementation.

1.2 Legislative Framework

Applicable regulation and guidelines has been presented in following table.

Table 1-1: Applicable Regulation & Guidelines

| Regulation and Guidelines | Description |
|--|---|
| Contract Labour (Regulation & Abolition) Act, 1970 | This Act regulates the employment of contractor labours in certain establishment and prohibits for its abolition in certain circumstances. |
| The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 | This regulation provides conditions of service of building and other construction workers including their safety, health and welfare measure. |
| IFC General EHS Guidelines: Occupational Health and Safety | This guideline provides guidance and example of reasonable precautions to implement in managing principle risks to occupational health and safety. |
| IFC Environmental, Health, and Safety Guidelines for Dairy Processing | This guideline provides dairy sector specific EHS guidelines applicable to reception, storage, and industrial processing of raw milk and the handling and storage of processed milk and dairy products. |
| IFC Environmental, Health, and Safety Guidelines for Mammalian Livestock Production | The EHS Guidelines for Mammalian Livestock Production includes information relevant to cattle ranching and farming and dairy farming. |

2. HAZARD IDENTIFICATION & MANAGEMENT

2.1 Principle

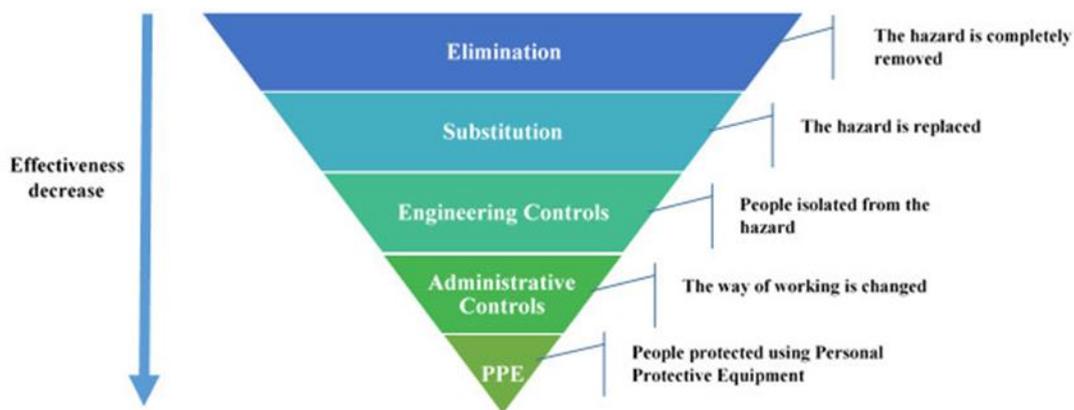
POIs, dairy plants and seed processing plants must take all reasonably practicable steps to protect the health and safety of workers and provide and maintain a safe and healthy working environment.

⁴¹ <https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final+-+General+EHS+Guidelines.pdf?MOD=AJPERES&CVID=jOWim3p>

The dairy processing activities involve milk storage, milk fat separation and standardization, pasteurization, milk skimming, and production of cheese, butter, and other milk products.

2.2 Risk Management

The hierarchy of control can be used as an effective tool to deal with health and safety issues at work. POIs, dairy plants and seed processing plants must use the type of control suggested as measures to deal with the hazard. Aim to use control measures from as high on the hierarchy of control list as possible. If that is not possible the next option down the list or a combination of the measures should be implemented. The least effective control measure is the use of personal protective equipment (PPE) and it should be used as a last resort or a support to other control measures. Information and training should be integrated with all levels of control to explain how controls work.



Source: The National Institute of Occupational Safety and Health (NIOSH)

2.3 Identification and Assessment of Hazard

Each employer must establish and maintain effective methods for:

- Systematically identifying existing and potential hazards to employees;
- Systematically identifying, at the earliest practicable time, new hazards to employees;
- Regularly assessing the extent to which a hazard poses a risk to employees

2.4 Management of Identified Hazard

Each employer must apply prevention and control measures to control hazards which are identified and assessed as posing a threat to the safety, health or welfare of employees and where practicable, the hazard shall be eliminated. The following preventive and protective measures must be implemented in order of priority:

Table 1-2: Potential Hazards for the Project

| Sl. No. | Sub-component reference and proposed activity | Hazard | Description of Hazard | Control Method |
|---------|---|--|--|--|
| 1. | B.1.2 - Strengthening village level milk chilling infrastructures | <ul style="list-style-type: none"> ■ Installation of bulk milk chiller (BMC) infrastructure ■ Fall hazards due to slippery conditions ■ Lifting hazard ■ Electrical hazard ■ Work at height and other unsafe jobs ■ Transportation of vehicles | <ul style="list-style-type: none"> ■ Installation of heavy vessel for milk storage can cause physical injury while lifting and placement ■ Milk and water spillage in the BMC premises will result in slipping of operator or visiting farmers. ■ While manual transferring the milk from milk cans to insulated milk storage vessel can cause lifting hazard resulting in sprains, strains, back and soft tissue injury. ■ Operation of BMC required heavy electrical load and may result in electrical shock in case of improper handling. ■ Work at height for maintenance or other work | <ul style="list-style-type: none"> ■ Use of small crane or pully system based lifting mechanism. ■ Avoid milk spillage and immediate wipe the spillage. Use dedicated space for washing of milk cans to avoid water spillage. ■ If possible, use mechanical lifting aid. Practice lifting of milk cans with two persons only and ensure appropriate rest between two lifts. ■ Always place the stabilizers, and control panels in a confined space at safe distance from milk vessel, use insulated wires and ensure earthing. ■ Develop and implement procedures on Lock Out Tag Out procedures prior to undertaking electrical or mechanical energy isolation. ■ Develop and implement procedures on work permit system for unsafe jobs including work at height, electrical safety, confined space, hot work etc. ■ Schedule visit of different types of vehicles to avoid traffic congestion. Federation owned or hired vehicle drivers |

| Sl. No. | Sub-component reference and proposed activity | Hazard | Description of Hazard | Control Method |
|---------|---|--|---|--|
| | | | <ul style="list-style-type: none"> Vehicle of individual farmers, from milk pooling points (MPPs) and from dairy plants will visit the BMC daily for milk supply and collection. | <ul style="list-style-type: none"> shall ensure training on defensive driving to minimise accidents and injury. |
| 2. | B.1.5 - Community Milking Centres | <ul style="list-style-type: none"> General Construction Activity Working at height Construction waste management Waste management Spread of vector borne diseases | <ul style="list-style-type: none"> Construction works may include excavation, working with concrete, iron bars, bricks etc. and may result in fall, trip, and other hazards. Construction activity may require working at height resulting in fall from height. Construction waste (e.g., scrap, concrete, discarded bricks) shall generate from the construction activity resulting in occupational health hazards. Community milking centres will generate cow dung and animal food waste that may result in odour and unhygienic workspace. During operation community milking centres will house various animals from different households and health conditions. In case of improper waste management and unhygienic workspace spread of vector borne diseases Refer SI. No. 1 | <ul style="list-style-type: none"> Ensure good construction practices, use appropriate PPEs. Always use safety harness while working on height and never work without supervision. Store construction waste in confines space and dispose them according to the guidelines prescribed by CPCB. Cow dung and animal food waste can be used as raw material in a Gobar-Gas plant. Alternatively, can be used to prepare manure for use in the farming. Good hygiene condition shall be maintained at the community milking centre to avoid the spread of vector borne diseases. Refer SI. No. 1 Refer SI. No. 1 |

| Sl. No. | Sub-component reference and proposed activity | Hazard | Description of Hazard | Control Method |
|---------|---|---|--|---|
| | | <ul style="list-style-type: none"> ■ Fall hazards due to slippery conditions ■ Lifting hazard | <ul style="list-style-type: none"> ■ Refer Sl. No. 1 | |
| 3. | B.1.8 - Village level Milk Pasteurization and Product Manufacturing | <ul style="list-style-type: none"> ■ Activity related with boilers and steam ■ General Construction Activity ■ Waste management ■ Fall hazards due to slippery conditions | <ul style="list-style-type: none"> ■ Working with boilers involves various associated hazards e.g., falls from ladders, stairs, and elevated platforms, burns from hot surfaces, hot water and escaping steam, electrocution or electric shocks, fires and explosions, bursting of boilers due to malfunctioning, heat stress caused by prolonged work at high temperatures etc. ■ Refer Sl. No. 2 ■ Refer Sl. No. 2 ■ Refer Sl. No. 1 | <ul style="list-style-type: none"> ■ A certified boiler attendant must be deputed to overlook the boiler related activities. Use appropriate PPEs while performing boiler related activities. ■ Refer Sl. No. 2 ■ Refer Sl. No. 2 ■ Refer Sl. No. 1 |
| | | <ul style="list-style-type: none"> ■ Slippery surfaces ■ Water logging ■ Inadequate or clogged drainage | <ul style="list-style-type: none"> ■ Loss of access to various locations by walk or by means of vehicles. ■ Increased risk of vehicle skidding. ■ Damage to vehicles if water ingests through the intake system of the vehicle. ■ Slippery surfaces. ■ Favours breeding of mosquitoes. ■ Increased risk of communicable diseases such as malaria, dengue, chikungunya, etc. | <ul style="list-style-type: none"> ■ Clean slipper surface, periodically ■ Provide adequate drainage facilities. ■ Provide danger indicative red flags signage in more muddy water or milk spilled logged areas. ■ Deviate the rainwater to ground water recharge ponds. ■ Spray neem oil or larvicides in water-logged areas. |

| Sl. No. | Sub-component reference and proposed activity | Hazard | Description of Hazard | Control Method |
|---------|---|---|--|---|
| 4. | B.2.2 - Installation of milk and milk products booths/ parlours/ kiosks | <ul style="list-style-type: none"> ■ COVID-19 hazard ■ Fall hazards due to slippery conditions ■ Lifting hazard | <ul style="list-style-type: none"> ■ At the booth or parlours people will visit to purchase the milk and milk products. Any COVID-19 affected person can infect the booth operator or other consumer resulting in the spread of disease. ■ Refer SI. No. 1 | <ul style="list-style-type: none"> ■ Maintain COVID-19 protocol and guidelines released by the government to minimise the chance of infection and prevent the spread of the disease. |
| 5. | B.3.2 - Dairy Plant Improvement | <ul style="list-style-type: none"> ■ Activity related with boilers and steam ■ General Construction Activity ■ Working at height ■ Waste management ■ Fall hazards due to slippery conditions | <ul style="list-style-type: none"> ■ Refer SI. No. 3 ■ Refer SI. No. 2 ■ Refer SI. No. 1 | <ul style="list-style-type: none"> ■ Refer SI. No. 3 ■ Refer SI. No. 2 ■ Refer SI. No. 1 |
| 6. | C.1.2 - Calf Rearing Centre | <ul style="list-style-type: none"> ■ General Construction Activity ■ Working at height ■ Construction waste management ■ Waste management ■ Spread of vector borne diseases ■ Fall hazards due to slippery conditions ■ Lifting hazard | <ul style="list-style-type: none"> ■ Refer SI. No. 2 | <ul style="list-style-type: none"> ■ Refer SI. No. 2 |
| 7. | C.2.1 - Setting up of Fodder Seed Processing Plant | <ul style="list-style-type: none"> ■ General Construction Activity | <ul style="list-style-type: none"> ■ Refer SI. No. 2 | <ul style="list-style-type: none"> ■ Refer SI. No. 2 |

| Sl. No. | Sub-component reference and proposed activity | Hazard | Description of Hazard | Control Method |
|---------|---|---|---|---|
| | | <ul style="list-style-type: none"> ■ Working at height ■ Construction waste management ■ Waste management ■ Fall hazards due to slippery conditions ■ Lifting hazard | | |
| 8. | C.3.1 - Pilot on control of Bovine Mastitis | <ul style="list-style-type: none"> ■ General Construction Activity ■ Improper waste management ■ Spread of vector borne diseases | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 |
| 9 | General | <ul style="list-style-type: none"> ■ Electrical Safety | <ul style="list-style-type: none"> ■ | <ul style="list-style-type: none"> ■ |

2.5 Training and Supervision

Each POI/ Plant operator must take all reasonably practicable steps to provide to employees (in appropriate languages) the necessary information, instruction; training and supervision to protect each employee's health and to manage emergencies that might reasonably be expected to arise in the course of work. Training and supervision extends to the correct use of PPE and providing employees with appropriate incentives to use PPE.

2.6 General duty of Employees

Each employee shall:

- Take all reasonable care to protect their own and fellow workers health and safety at the workplace and, as appropriate, other persons in the vicinity of the workplace.
- Use PPE and other safety equipment supplied as required; and
- Not use PPE or other safety equipment for any purpose not directly related to the work for which it is provided.

2.7 Protective Clothing and Equipment

Each employer shall:

- Provide, maintain, and make accessible to employees the PPE necessary to avoid injury and damage to their health.
- Take all reasonably practicable steps to ensure that employees use that PPE in the circumstances for which it is provided; and
- Make provision at the workplace for PPE to be cleaned and securely stored without risk of damage when not required.

3. JOB SAFETY ANALYSIS

Job safety analysis (JSA) is a process involving the identification of potential health and safety hazards from a particular work activity and designing risk control measures to eliminate the hazards or reduce the risk to an acceptable level. JSAs must be undertaken for discrete project activities such that the risks can be readily identified and appropriate risk management measures designed.

This Guideline includes a template for a JSA that must be completed and included as an **Appendix A**.

4. IMPLEMENTATION

4.1 Documentation

An Occupational Health and Safety Management Plan must be prepared and approved prior to any works commencing on site. The Health and Safety Management Plan must demonstrate the Contractor understands of how to manage safety and a commitment to providing a workplace that enables all work activities to be carried out safely. The Health and Safety Management Plan must detail reasonably practicable measures to eliminate or minimise risks to the health, safety and welfare of workers, contractors, visitors, and anyone else who may be affected by the operations. The Occupational Health and Safety Management Plan must be prepared in accordance with the World Bank Group EH&S Guidelines.

4.2 Training and Awareness

Provisions should be made to provide health and safety orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees. Training should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate.

Visitors to worksites must be provided with a site induction prior to entering and must be escorted at times while on site. This induction must include details of site hazards, provision of necessary PPE and emergency procedures. Visitors are not permitted to access to areas where hazardous conditions or substances may be present, unless appropriately inducted.

4.3 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems.

The table below presents general examples of occupational hazards and types of PPE available for different purposes.

Table 1-3: List of PPEs

| Objective | Hazard | Suggested PPE |
|-------------------------|---|--|
| Eye and face protection | Flying particles, milk spillage, gases or vapours | Safety Glasses with side-shields, protective shades, etc. |
| Head protection | Falling objects, inadequate height clearance, | Hard hats |
| Hearing protection | Noise. | Hearing protectors (ear plugs or ear muffs). |
| Foot protection | Construction activity, working with hot liquids. | Safety shoes and boots for protection against moving & falling objects, liquids and chemicals. |
| Hand protection | Hazardous materials, extreme temperatures. | Gloves made of rubber or synthetic materials |
| Respiratory protection | Dust, fogs, fumes, mists, gases, smokes, vapours. | Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapours and gases). |
| Body/leg protection | Extreme temperatures, hazardous materials, biological agents, | Insulating clothing, body suits aprons etc. of appropriate materials. |
| COVID-19 | COVID-19 related hazard at MPP, BMC, and processing plants | Sanitizers, gloves, and facemasks shall be used at as per the government directives. Practice social distancing. |

5. COMMUNITY HEALTH AND SAFETY

Community health and safety impacts during the construction of dairy processing plants are important and involve general construction activities involving working at height. During the facility's planning phase, the location of the processing facility should be designated at an appropriate distance from neighbours, and access roads should be assessed for suitable use in food transport. Community health and safety impacts during the operation phase that are common to most industry sectors, including those related to traffic safety during transport of raw materials and finished product, are discussed in the General EHS Guidelines.

Industry-specific issues with the potential to impact the community or the public at large are those associated with pathogens or microbial contaminants, as well as other chemical or physical impacts, associated with processed dairy products.

5.1 Food Safety Impacts and Management

The milk federation should obtain the ISO 9001, ISO 22000, HACCP certification for the dairy supply chain including the milk processing plant, BMC, and the commercial outlets/ kiosks. Standards are necessary condition for improving the overall quality of food safety & hygiene by adoption of food safety and quality assurance mechanisms. These schemes will help India dairy supply chain related industry to demonstrate compliance to global standards as many countries have mandated Hazard Analysis Critical Control Point (HACCP) for the dairy sector.

Central/ State Government Organizations and private sector in the field of food processing sector are eligible for assistance under the scheme for implementation of HACCP/ ISO Standards / Food safety/ Quality Safety Management Systems. Grant-in-aid is given in the form of re-imbursment of expenditure towards implementation by Ministry of Food Processing Industries (MFPI).

Table 1-4: Identified Community Health and Safety Hazards

| Sl. No. | Sub-component reference and proposed activity | Hazard | Description of Hazard | Control Method |
|---------|---|---|--|---|
| 1. | B.1.2 - Strengthening village level milk chilling infrastructures | <ul style="list-style-type: none"> ■ Transportation of vehicles | <ul style="list-style-type: none"> ■ Installation of heavy vessel for milk storage will involve heavy vehicle for transportation. ■ Vehicle of individual farmers, from milk pooling points (MPPs) and from dairy plants will also visit the BMC daily for milk supply and collection. | <ul style="list-style-type: none"> ■ Use of small crane or pulley system based lifting mechanism to unload the storage vessel. Avoid public gathering at the BMC to minimise the risk of injury to the public. ■ Schedule visit of different types of vehicles to avoid traffic congestion. Federation owned or hired vehicle drivers shall ensure training on defensive driving to minimise accidents and injury. |
| 2. | B.1.5 - Community Milking Centres | <ul style="list-style-type: none"> ■ Waste management ■ Spread of vector borne diseases | <ul style="list-style-type: none"> ■ Community milking centres will generate cow dung, cow urine and animal food waste. Dumping the waste at the site may result in odour and increase of insects (mosquitos etc.) getting nutrition from the waste. ■ During operation community milking centres will house various animals from different households and health conditions. In case of improper waste management and unhygienic workspace spread of vector borne diseases. | <ul style="list-style-type: none"> ■ Cow dung, cow urine and animal food waste should be stored at site for minimum possible period. It can be used as raw material in a Gobar-Gas plant. Alternatively, can be used to prepare manure for use in the farming. Dumping of waste in nearby sanitary land fill can also be practiced as last resort to manage the waste. ■ Any bio-medical waste generated from the centre should be disposed as per the guidelines prescribed from the CPCB in Bio-medical waste management guidelines, 2016. ■ Good hygiene condition shall be maintained at the community milking centre (e.g., maintain cleanliness, avoid stagnant water/ wastewater, sprinkle lime |

| | | | | |
|----|---|---|---|---|
| | | | | powder at wet and damp areas etc.) to avoid the spread of vector borne diseases. |
| 3. | B.2.2 - Installation of milk and milk products booths/ parlours/ kiosks | <ul style="list-style-type: none"> ■ COVID-19 hazard | <ul style="list-style-type: none"> ■ At the booth or parlours people will visit to purchase the milk and milk products. Any COVID-19 affected person can infect the booth operator or other consumer resulting in the spread of disease. | <ul style="list-style-type: none"> ■ Maintain COVID-19 protocol and guidelines released by the government to minimise the chance of infection and prevent the spread of the disease. |
| 4. | C.1.2 - Calf Rearing Centre | <ul style="list-style-type: none"> ■ Waste management ■ Spread of vector borne diseases | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 |
| 5. | C.2.1 - Setting up of Fodder Seed Processing Plant | <ul style="list-style-type: none"> ■ Waste management | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 |
| 6. | C.3.1 - Pilot on control of Bovine Mastitis | <ul style="list-style-type: none"> ■ Waste management ■ Spread of vector borne diseases | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 |
| 7. | C.4 - Establishing Gobar gas Clusters and slurry processing centres | <ul style="list-style-type: none"> ■ Waste management ■ Spread of vector borne diseases | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 | <ul style="list-style-type: none"> ■ Refer Sl. No. 2 |

6. INCIDENT INVESTIGATION AND REPORTING

All accidents, incidents, near misses and dangerous occurrences are investigated by an Incident Investigation Committee and contributory causes are found out.

The reporting of all incidents shall be done by telephone or mobile phone in an immediate sense. Health and Safety Personal submit the Preliminary Incident Report received from the Site–Engineer to Project Manager.

Corrective and Preventive action plan is prepared based on the causes. The Preventive measures suggested during investigation are communicated to the down line through meeting / talks in order to avoid recurrence for implementation.

6.1 Emergency Preparedness

The Contractor shall be make arrangements for emergency preparedness to:

- Show all workers and subcontractors the emergency point as part of their induction (this shall be covered in the induction checklist)
- Display emergency procedures and emergency contact numbers in the site office or other visible locations.
- Provide and inspect fire extinguishers at the beginning of the project and six-monthly after that.

6.2 Emergency Procedure

In the event of a fire or similar emergency evacuation, the Contractor shall adopt following measures:

- Constitute an Emergency Response Team and develop a response plan encompassing all potential emergency situations;
- Stop work immediately and vacate the workplace;
- Assist anyone in the workplace who may not be familiar with the evacuation procedures;
- Call emergency services on the desired number. Other emergency numbers are on display in the site office (if applicable);
- Notify the principal employer (Milk Federation);
- Assemble in the nominated assembly points until you receive further instructions from the principal employer or emergency services personnel.

7. SAFE OPERATING PROCEDURE

Safe Operating procedure is the document for operational control. Site adhere the SOP for all the Project activities including Construction and Operation & Maintenance phases.

It is prepared for each activity by collating the existing control measures & the additional control measures identified during the Risk Assessment.

Possible Engineering control measures shall be incorporated for permanent risk mitigation.

Detailed written method statements for each major activity whether such activities are directly controlled by the Contractor or subcontracted.

8. ROLES AND RESPONSIBILITIES

The PMU-NDDB will be responsible for the operationalization and overall implementation of this occupational and community health and safety management procedure (OCHSMP). PMU-NDDB will have a dedicated Environment and Social (E&S) Cell, who will act as Nodal Officer for implementation of E&S management system. E&S Cell will seek OCHSMP implementation update on predefined KPIs from POIs of respective states in the monthly, quarterly and annual project implementation update report.

Table 1-5: Roles and Responsibilities

| S. No | Entity | Responsibility in SEP implementation |
|-------|--|--|
| 1 | E&S Cell, NDDB | <ul style="list-style-type: none"> ■ Nodal agency for implementing E&S action plan including WMP implementation; ■ Updating WMP on regular basis based on feedback received from line agencies like CPSC, PFC, SLTMC, POIs ■ Supervision of OCHSMP implementation by POIs |
| 2 | State Level Technical Management Committee (SLTMC) | <ul style="list-style-type: none"> ■ Monitor OCHSMP implementation by respective POIs of the state; ■ Provide feedback to NDDB on OCHSMP related matters, including periodic data on implementation |
| 3 | State Federation | <ul style="list-style-type: none"> ■ Monitor WMP implementation by respective POIs of the state; ■ Provide feedback to NDDB on OCHSMP related matters. |
| 4 | Other POIs (Milk Union, Milk Producer Companies, FPO etc.) | <ul style="list-style-type: none"> ■ Implement actions as proposed in OCHSMP with the guidance from NDDB; ■ Maintain records of monitoring at their offices. |

9. REPORTING

- Contractor engaged in the construction activities at dairy plant, BMC or any other structure will follow safe working condition at site and will provide input such as first aid register record at sites, PPE distribution to workers etc. which needs to be incorporated in MPR.
- Contractor's EHS person will be responsible to check the safety performance of the sub-contractor. And they will also responsible for conducting first aid training, emergency response training for sub-contractors.
- Respective State Federation will give guidance to Dairy Plant Operators or contractor for better implementation of health and safety plan at project site.

ANNEXURE 1: JOB SAFETY ANALYSIS TEMPLATE

| Business details | | | |
|---|--|--|--|
| Business name: | | Contact person: | |
| Address: | | Contact position: | |
| Contact phone number | | Contact email address: | |
| Job Safety Analysis details | | | |
| Work activity: | | Location: | |
| Who are involved in the activity: | | This job analysis has been authorized by: Name: Position:..... Signature: Date: | |
| Equipment used: | | | |
| Maintenance checks required: | | | |
| Tools used: | | | |
| Materials used: | | | |
| Personal protective equipment: | | | |
| Certificates, permits and/approvals required | | | |
| Relevant EHG Guideline, codes, etc. applicable to this activity | | | |

ANNEXURE 2: EMERGENCY CONTACT DETAIL TEMPLATE

| Sl No | Name | Designation | Contact Number |
|---|------|-------------|----------------|
| Milk Federation Emergency Contact Number | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| Dairy Plant Emergency Contact Number | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| Contractor's Emergency Contact Number | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| General Emergency Contact Number (Nearby/ Government facilities e.g., Fire, Police, Ambulances etc.) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |

ANNEXURE 3: EMERGENCY RESPONSE TEAM FOR OFFICE

| SI No | Emergency Responsibilities | Name | Contact Number |
|-------|----------------------------|------|----------------|
| 1 | Emergency Team Leader | | |
| 2 | Emergency Coordinator | | |
| 3 | Emergency Team Member | | |

ANNEXURE 4: EMERGENCY RESPONSE TEAM FOR SITE

| Sl. No. | Emergency Responsibilities | Name | Contact Number |
|---------|----------------------------|------|----------------|
| 1 | Emergency Team Leader | | |
| 2 | Emergency Coordinator | | |
| 3 | Emergency Team Member | | |

APPENDIX P: AIR & NOISE QUALITY MANAGEMENT PLAN

1. INTRODUCTION

1.1 Objectives

The environment is impacted at every step of the dairy supply chain, including production, processing, packaging, shipping, storage, distribution, and marketing. The dairy supply chain has limited number of components or sources that emit air and noise to pollute the environment. Because of the industry's diversity, numerous product processing, handling, and packing processes generate air and noise emissions of varying quality and quantity, which, if not managed, could result in increasing environmental issues.

Main objectives of air and noise management procedure are:

- To maintain the National Ambient Air Quality Standards for ambient air quality set by the Central Pollution Control Board (CPCB). The CPCB has been conferred this power by the Air (Prevention and Control of Pollution) Act, 1981. Standards are attached in **Annexure 1**.
- To maintain the noise environment (Ambient noise level and vibration) as per the prescribed noise standards to minimize the hazard affecting labours and residents living in nearby areas. Standards are attached in **Annexure-2**.

1.2 Regulatory Framework and Safeguards

Relevant provisions under the following regulations, guidelines and pertinent standards are applicable towards the implementation of this air and noise management procedure.

Table 1-1: Applicable Regulation & Guidelines

| Law | Description |
|--|--|
| Air (Prevention and Control of Pollution) Act, 1981. | This act is responsible for both testing air quality and assisting governments in planning to meet such standards. State Pollution Control Boards are permitted to set stricter standards than those in effect nationally. |
| The Noise Pollution (Regulation and Control) Rules, 2000 | This standard lays down the requirements for carrying out safely the excavation work, such as trenches, test pits, cellars; borrow pits, cuttings for rail, canal and road formations and all excavations on which the sides of excavations are not trimmed simultaneously to a stable slope. |
| Environment (Protection) Rules, 1986 | The increasing ambient noise levels in construction site from various sources e.g., construction activity, sound producing instruments, generator sets, vehicular horns and other mechanical devices have deleterious effects on human health and the psychological well-being of the people; it is considered necessary to regulate and control noise producing and generating sources with the objective of maintaining the ambient air quality standards in respect of noise; |
| General EHS Guidelines: Noise Environment & Occupational Health and Safety | This section addresses impacts of noise beyond the property boundary of the facilities. Worker exposure to noise is covered in Section 2.0 on Occupational Health and Safety. |

2. POTENTIAL IMPACTS

2.1 Potential impact on air and noise quality

The civil construction activities will generate fugitive emission from earth work, handling of construction materials and transportation of construction materials. Operation of machineries and equipment would generate noise. Air and noise emission potential to cause localised impact on ambient air and noise quality. Milk & Fodder processing plants are the prime locations of air & noise generation activities in Dairy Supply Chain. Apart from that transportation activities will also contribute to the air and noise generation.

2.2 Potential impact on landscape and aesthetics

In the dairy supply chain project, following key impacts are anticipated during construction stage-

- Civil construction activities – Setting up milk processing plant, fodder seed processing plant etc.
- Increase in vehicular emission from vehicles engaged in supply of construction materials.

Following key impacts are anticipated during implementation stage-

- Increase in localized traffic at BMC and MPP will have impact on air quality and noise levels in the locality;
- The boilers at milk processing plants could be diesel fired or coal fired and in both cases air emissions will occur. Particles emissions are caused either by combustion of solid or liquid fuel. The use of solid or liquid fuel such as briquettes and oil can result in fallout – carbonaceous ash particulate is usually emitted during boiler upsets.
- Milk spray drying process will accumulate milk powder particles on flat surfaces such as roofing, guttering and rainwater tanks, and may seriously compromise the quality of storm water discharged from the site;
- DG sets available at BMCs for the day-to-day operations and at milk processing plants for power backup requirements. A significant amount of air emissions is contributed from the DG sets;
- Heavy machines involved in various steps of milk processing and will generate noise during the operations.

2.3 Potential impact on occupational and community health

Increased air and noise emissions will lead to air and noise pollution. Air pollution will have adverse effect (e.g. breathing problem, eye irritation etc) on human health through respiration. Noise pollution can cause hearing impaired problem. Thus increased air and noise emission can have a negative impact on the occupational health as well as the community health.

3. MANAGEMENT PLAN

The POIs, fodder seed processing plant, and dairy plant and must apply prevention and control measures to control hazards which are identified and assessed as posing a threat to the environment, and where practicable, the hazard shall be eliminated. The following preventive and protective measures must be implemented:

- Adopted through periodic water sprinkling during dry period in working area;
- Construction materials shall be stored in designated storage area;
- DG set with adequate stack shall be used for sourcing of power for construction activities;
- Appropriate PPE should be provided to the construction workforce.

Table 1-2: Identified Air & Noise Hazards

| Sl. No. | Sub-component reference and proposed activity | Stages | Description of Hazard | Control / Mitigation measure |
|---------|---|-----------------------------------|---|---|
| 1. | B.1 - Strengthening village level milk chilling infrastructures | Operations Stage | <ul style="list-style-type: none"> ■ Daily plying of vehicles anticipated to MPPs and BMCs for milk supply. Also, the milk tankers will visit BMC daily for collection of milk. Due to the daily vehicle movement air and noise emission will generate. ■ DG sets are used in the BMCs for power supply and backup. This will cause air and noise emissions | <ul style="list-style-type: none"> ■ Vehicular noise and emission can be controlled by regular vehicle servicing. ■ Stack height should be maintained to regulate air emissions. DG sets should be fitted with acoustic enclosure to minimise noise emission. |
| 2. | B.1 - Village level Milk Pasteurization and Product Manufacturing | Construction Stage | <ul style="list-style-type: none"> ■ Coal or diesel fired boilers may cause air emissions. ■ DG sets for may cause air and noise emission available for power backup. ■ Noise emissions from milk processing machinery. | <ul style="list-style-type: none"> ■ Maintain stack height for boiler furnace and DG sets as prescribed by CPCB/SPCB. ■ DG sets should have acoustic enclosure to reduce the noise emissions. ■ Regular servicing of milk processing machinery as recommended by manufacturer. |
| 3. | | Operations Stage | <ul style="list-style-type: none"> ■ Civil construction activities may result in fugitive air emissions degrading the air environment. | <ul style="list-style-type: none"> ■ Daily water sprinkling should be ensured to arrest the dust particles in construction areas. |
| 4. | B.2 - Installation of milk and milk products booths/ parlours/ kiosks | Construction and Operations Stage | <ul style="list-style-type: none"> ■ Refer Sl. No. 1. | <ul style="list-style-type: none"> ■ Refer Sl. No. 1. |
| 5. | B.3 - Dairy Plant Improvement | Construction and Operations Stage | <ul style="list-style-type: none"> ■ Refer Sl. No. 2. | <ul style="list-style-type: none"> ■ Refer Sl. No. 2. |
| 6. | C.2 - Setting up of Fodder Seed Processing Plant | Construction and Operations Stage | <ul style="list-style-type: none"> ■ Refer Sl. No. 2. | <ul style="list-style-type: none"> ■ Refer Sl. No. 2. |

4. IMPLEMENTATION ARRANGEMENTS

4.1 Roles and Responsibilities

The PMU-NDDB will be responsible for the operationalization and overall implementation of this Air and Noise Management Procedure. PMU-NDDB will have a dedicated Environment and Social (E&S) Cell, who will act as Nodal Officer for implementation of E&S management system. E&S Cell will seek Air and Noise Management Procedure implementation update on predefined KPIs from POIs of respective states in the monthly, quarterly, and annual project implementation update report.

Table 1-3 Roles and Responsibilities for SEP Implementation

| S. No | Entity | Responsibility in SEP implementation |
|-------|--|--|
| 1 | E&S Cell, NDDB | <ul style="list-style-type: none">■ Nodal agency for implementing E&S action plan including Air and Noise Management procedure implementation;■ Updating Air and Noise Management on regular basis based on feedback received from line agencies like CPSC, PFC, SLTMC, POIs■ Supervision of Air and Noise Management implementation by POIs |
| 2 | State Level Technical Management Committee (SLTMC) | <ul style="list-style-type: none">■ Monitor Air and Noise Management implementation by respective POIs of the state;■ Provide feedback to NDDB on Air and Noise Management related matters, including periodic data on implementation |
| 3 | State Federation | <ul style="list-style-type: none">■ Monitor Air and Noise Management implementation by respective POIs of the state;■ Provide feedback to NDDB on Air and Noise Management related matters. |
| 4 | Other POIs (Milk Union, Milk Producer Companies, FPO etc.) | <ul style="list-style-type: none">■ Implement actions as proposed in Air and Noise Management with the guidance from NDDB;■ Maintain records of monitoring at their offices.■ Development of site specific Air and Noise Management Plan base on this procedure■ Ensure necessary approvals including consent to establish and consent to operate are obtained from applicable state pollution control board. |

4.2 Training on Air and Noise Management implementation

Sufficient training needs to be provided to all personnel. The scope of the training will ensure that workers are able to understand the risks of air and noise emission and understand their roles and functions through awareness on relevant aspects of this plan, related legislation and standards and general pollution prevention practices. Training details (e.g. participants, subjects, training hours provided, etc.) will be recorded.

4.3 Monitoring and Reporting

Performance of POIs on Air and Noise Management implementation will be assessed based on following monitoring and reporting activities.

- Periodical site inspection and visual observation;
- Monthly inspection report to State Federation

ANNEXURE 1: NATIONAL AMBIENT AIR QUALITY STANDARDS

| Pollutants | Time Weighted Average | Concentration in Ambient Air | |
|--|-----------------------|--|--|
| | | Industrial, Residential, Rural and Other Areas | Ecologically Sensitive Area (notified by Central Government) |
| SO ₂ , µg/m ³ | Annual* | 50 | 20 |
| | 24 hours** | 80 | 80 |
| NO ₂ µg/m ³ | Annual* | 40 | 30 |
| | 24 hours** | 80 | 80 |
| PM ₁₀ µg/m ³ | Annual* | 60 | 60 |
| | 24 hours** | 100 | 100 |
| PM _{2.5} µg/m ³ | Annual* | 40 | 40 |
| | 24 hours** | 60 | 60 |
| O ₃ µg/m ³ | Annual* | 100 | 100 |
| | 24 hours** | 180 | 180 |
| Lead (Pb) µg/m ³ | Annual* | 0.5 | 0.5 |
| | 24 hours** | 1 | 1 |
| CO µg/m ³ | Annual* | 2 | 2 |
| | 24 hours** | 4 | 4 |
| Ammonia (NH ₃) µg/m ³ | Annual* | 100 | 100 |
| | 24 hours** | 400 | 400 |
| Benzene | Annual* | 5 | 5 |
| Benzopyrene (BaP) – particulate phase only, ng/m ³ | Annual* | 1 | 1 |
| Arsenic (As) ng/m ³ | Annual* | 6 | 6 |
| Nickel (Ni), ng/m ³ | Annual* | 20 | 20 |

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Source: National Ambient Air Quality Standards, 2009

ANNEXURE 2: NATIONAL AMBIENT NOISE QUALITY STANDARDS

| Area code | Category of Area/ Zone | Limits in dB(A) ⁴² | | Limits in dB(A) ⁴³ | |
|-----------|------------------------|-------------------------------|------------|-------------------------------|----------------------------|
| | | Day Time | Night-Time | Day Time (07:00 – 22:00) | Night-Time (22:00 – 07:00) |
| (A) | Industrial Area | 75 | 70 | 70 | 70 |
| (B) | Commercial Area | 65 | 55 | | |
| (C) | Residential Area | 55 | 45 | 55 | 45 |
| (D) | Silence Zone | 50 | 40 | | |

ANNEXURE 3: AMBIENT NOISE LEVEL CHECKLIST

| Ambient Noise Levels | |
|---|--|
| Ambient air noise levels monitored every six months? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No If yes, no. of monitoring locations – <i>Attach the monitoring reports as an Annexure to the report.</i> |
| Received any complaints/ concerns from local people related to inconvenience caused due to odour, polluted air and higher noise levels? | <input type="checkbox"/> Yes/ <input type="checkbox"/> No If yes, provide the details of complains and actions taken to mitigate it. |
| No. of environmental incidents (i.e., Odour outburst, High air pollution, high noise levels etc.) | |

⁴² Indian ambient noise standards - The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

⁴³ Guidelines for Community Noise, World Health Organization (WHO), 1999.

APPENDIX Q: GHG EMISSION REDUCTION STRATEGY

1. OBJECTIVE

“To enhance competitiveness and climate resilience of milk value chains focusing on smallholder livestock farmers in the project area.”

Component C: Productivity Improvement and Enhancing Climate Resilient Rearing Practices:

- Sub-Component C1: Promotion of Scientific Feeding Practices
- Sub-Component C2: Demonstration of Fodder Production and Conservation Technologies
- Sub-Component C3: Control of Bovine Mastitis & Ethno-Veterinary Medicine (EVM)
- Sub-Component C4: Renewable energy solutions and GHG mitigation interventions
 - Manure Value Chain Development Program
 - Renewable Energy Solutions in Dairy
 - Evolving Green House Gas (GHG) Mitigation Strategies
 - propagation of scientific feeding practices

Project Area:

Jharkhand, Orissa, Madhya Pradesh, Himachal Pradesh, Uttarakhand

2. ACTIVITIES UNDERTAKEN

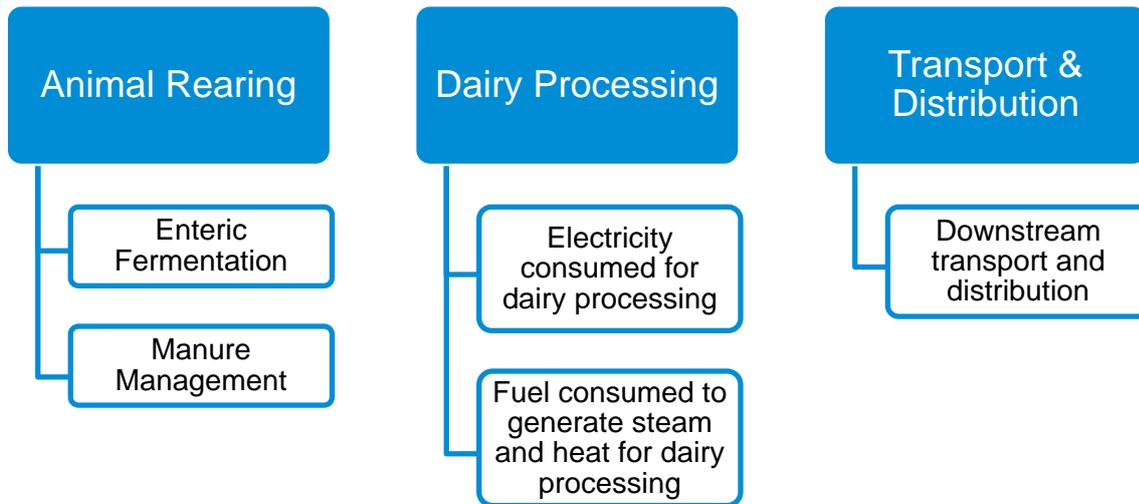
ERM have assessed the emissions profile of NDDDB in this scope of work. This assessment has been undertaken on the basis of primary surveys conducted by ERM as well as supplementary data provided by NDDDB, secondary data available in the public domain, stakeholder consultations and a primary survey of households, co-operatives, and retailers in the five targeted states: Himachal Pradesh, Uttarakhand, Madhya Pradesh, Jharkhand, and Odisha. The GHG emissions baseline captures key sources of emissions along the dairy and milk chain as well as highlighting.

The key activities of the dairy sector in India that contribute to GHG emissions include enteric fermentation, manure management, processing of milk, and downstream distribution of milk for selling.

3. SOURCES OF EMISSIONS

- The key sources of emissions identified in the selected states include:
 - Scope 1 GHG Emissions from Enteric Fermentation, Manure Management and Stationary Combustion of Light Diesel Oil used for Dairy processing.
 - Scope 2 GHG Emissions from purchased electricity for Dairy processing
 - Scope 3 GHG Emissions from the Downstream Transport and Distribution of Goods (Freighting of Milk)
- The emission sources have been categorized according to activities as follows:

Figure 1.1 GHG Emission Sources



3.1 Animal Rearing

3.1.1 Enteric Fermentation

Enteric (occurring in the intestines) methane is produced through enteric fermentation where plant material is broken down in the rumen. Enteric methane is the by-product of this process and is expelled by the animal through belching.

Enteric fermentation emissions in dairy animals (cows that produce milk) is around 46 kilograms of methane per head per year and 55 kilograms of methane per head per year for Buffaloes. Non-dairy cattle and calves account for 25 kilograms of methane emissions per head per year. Methane has a Global Warming Potential (GWP) of 28. Global Warming Potential is a measure of cumulative radiative forcing, which aims to quantify the long-term contribution of a gas to global warming. Methane can be expressed in carbon dioxide equivalent by multiplying the amount of methane by its GWP. E.g., if 1kg of methane is emitted, this can be expressed as 28 kg of CO₂-e (1kg CH₄ * 28 = 28 kgCO₂-e).

Scope 1 emissions from enteric fermentation have been calculated on the basis of emission factor sourced through a journal article (T.V. Ramachandra, 2015), number of cattle heads per state and the GWP of methane.

3.1.2 Manure Management

Manure management relates to how manure is captured, stored, treated, and used. It is another source of methane emissions. Manure management emissions in dairy animals (cows that produce milk) is around 3.6 kilograms of methane per head per year and 4 kilograms of methane per head per year for Buffaloes. Non-dairy cattle and calves account for 2.7 and 1.8 kilograms of methane emissions per head per year, respectively.

Scope 1 emissions from manure management have been calculated on the basis of emission factor sourced through a journal article (T.V. Ramachandra, 2015), number of cattle heads per state and the GWP of methane.

3.2 Dairy Processing

Dairy processing involves processes such as the chilling and pasteurization of milk, and processes for turning milk into milk products such as ice cream, butter, curd, paneer, cheese, ghee etc.

These processes require the use of electricity and fuel to generate power, heat and steam required for the production processes and to operate various equipment.

Note: ERM have received the details for Dairy Processing Plants for Himachal Pradesh, Jharkhand, Madhya Pradesh, and Uttarakhand only. No data has been received for any dairy processing plants in Orissa.

3.2.1 Electricity consumed for Dairy Processing

According to the 6 lakh liters per day Dairy plant process time schedule document provided to us by NDDDB (“PTS_Dairy Plant_6 LLPD.xlsx”), a typical dairy processing plant uses electricity for refrigeration, chilling / cooling, for operating equipment / machines / paraphernalia, etc. used for the processing of dairy. Based on the average consumption data, a dairy processing plant consumes around 10,290 kWh of electricity per day – which translates to 37,55,850 kWh of electricity annually. Emissions from electricity consumed at the dairy processing plant are categorized under Scope 2 emissions.

Emissions from electricity consumption have been calculated using the electricity consumption data from the PTS_Dairy Plant_6 LLPD.xlsx document, which has then been used as a proxy for all the dairy processing sites due to unavailability of data. There is no electricity consumption data for Orissa as no data has been received for number of dairy processing plants in the state.

3.2.2 Fuel consumed for Dairy Processing

Similarly, the process time schedule document (“PTS Dairy Plant_6 LLPD.xlsx”) also details that the plant uses Light Diesel Oil (LDO) to generate steam required for dairy processing. A typical Dairy Processing plant consumes around 4,669 litres of Light diesel oil (LDO) daily (17,04,310 liters annually). Emissions from the combustion of fuel (LDO) are categorized under Scope 1 emissions.

Emissions from fuel consumption have been calculated using the LDO fuel consumption data from the PTS_Dairy Plant_6 LLPD.xlsx document, which has then been used as a proxy for all the dairy processing sites due to unavailability of data. There is no LDO consumption data for Orissa as no data has been received for number of dairy processing plants in the state.

3.3 Transportation and Distribution of Milk

Downstream Transportation and Distribution includes emissions that occur in the reporting year from transportation and distribution of sold products – milk – in vehicles and facilities not owned or controlled by the reporting company i.e., NDDDB. Emissions from Downstream transportation and distribution are covered under Category 9 of Scope 3 emissions as per the Greenhouse Gas Protocol (GHG Protocol)

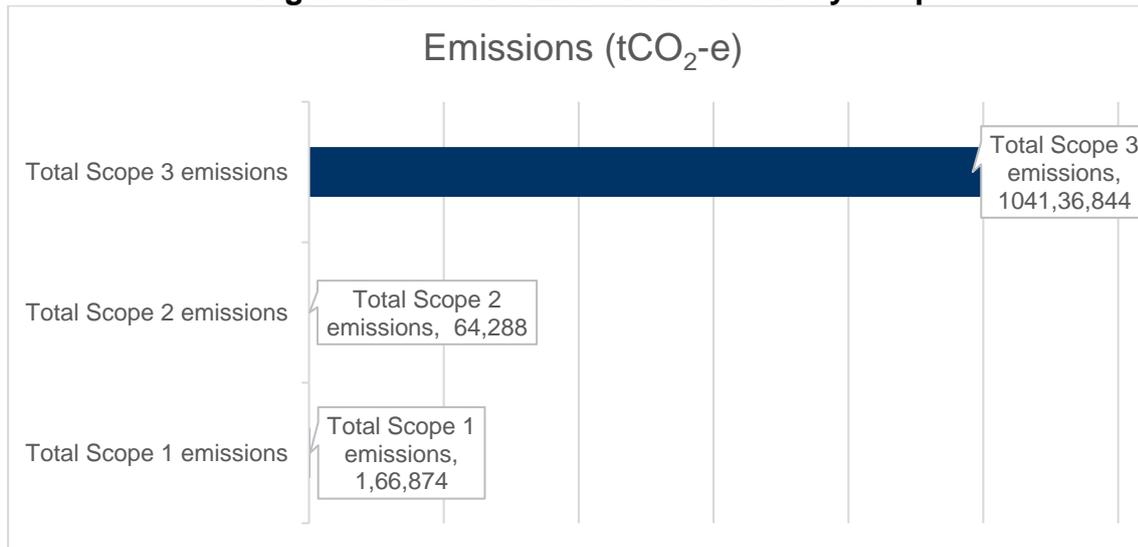
Emissions from the transportation and distribution of milk are value chain emissions and have been calculated using the data from the Bhopal Milk Union for number of vehicles engaged in transport and distribution of milk, the daily distance travelled by milk carrying vehicles, the average quantity of milk moved per day and the average procurement per day for the particular districts / states and unions within them.

Greenhouse Gas Emissions generated by the above emission sources in dairy and milk chain are summarized in **Table 4.1** below:

Table 1.1: Dairy and Milk Chain GHG Emissions

| Scope | Emissions (tCO ₂ -e) |
|--|---------------------------------|
| Total Scope 1 emissions | 1,66,874 |
| Total Scope 2 emissions | 64,288 |
| Total Scope 3 emissions | 10,41,36,844 |
| Grand Total GHG Emissions / Carbon Footprint of NDDB Milk Chain | 10,43,68,006 |

Figure 1.2 GHG Emissions Profile by Scopes



Scope 3 GHG emissions (99.78%) account for the largest proportion of total GHG emissions in dairy and milk Chain followed by Scope 1 GHG emissions (0.16%) and Scope 2 GHG emissions (0.06%).

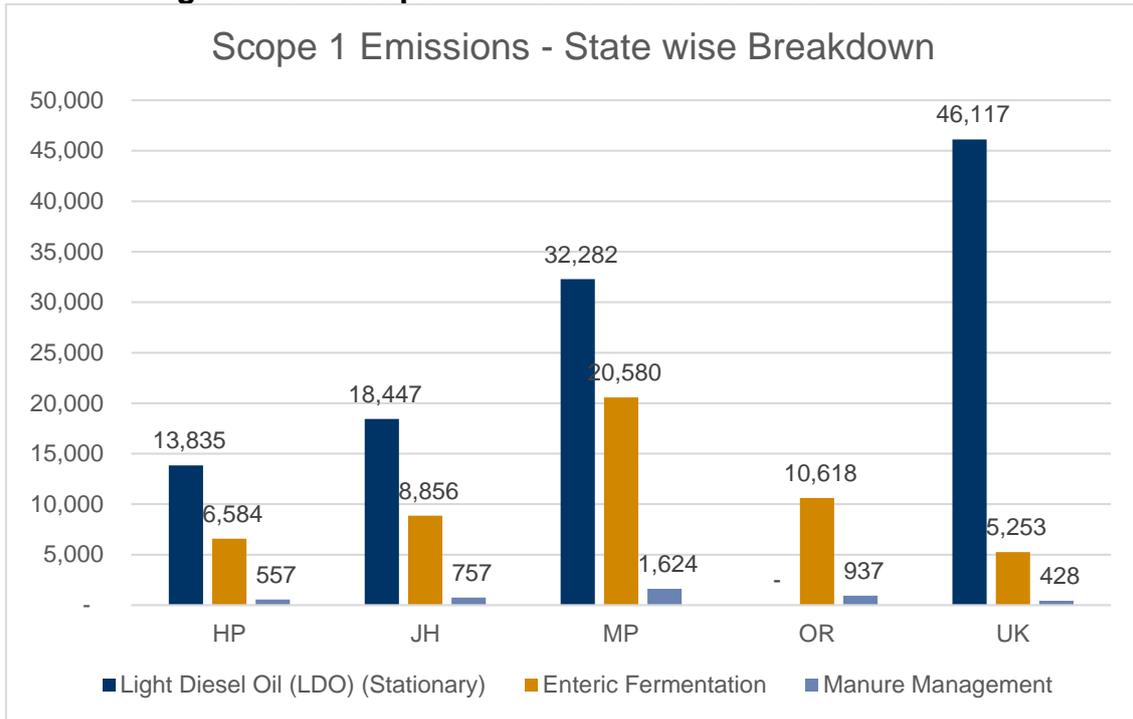
3.4 Scope 1 and Scope 2 GHG Emissions

3.4.1 Scope 1 GHG Emissions

Scope 1 emissions accounted for **1,66,874 tonnes** of CO₂-eq emissions across the five states (Himachal Pradesh, Jharkhand, Madhya Pradesh, Orissa, and Uttarakhand) in dairy and milk chain. Enteric Fermentation, Manure Management and Light Diesel Oil (Stationary) were the sources of Scope 1 emissions.

The State wise breakdown of Scope 1 emissions categorized by sources of Scope 1 emissions are shown in **Error! Reference source not found..**

Figure 1.3 Scope 1 Emissions - State wise Breakdown



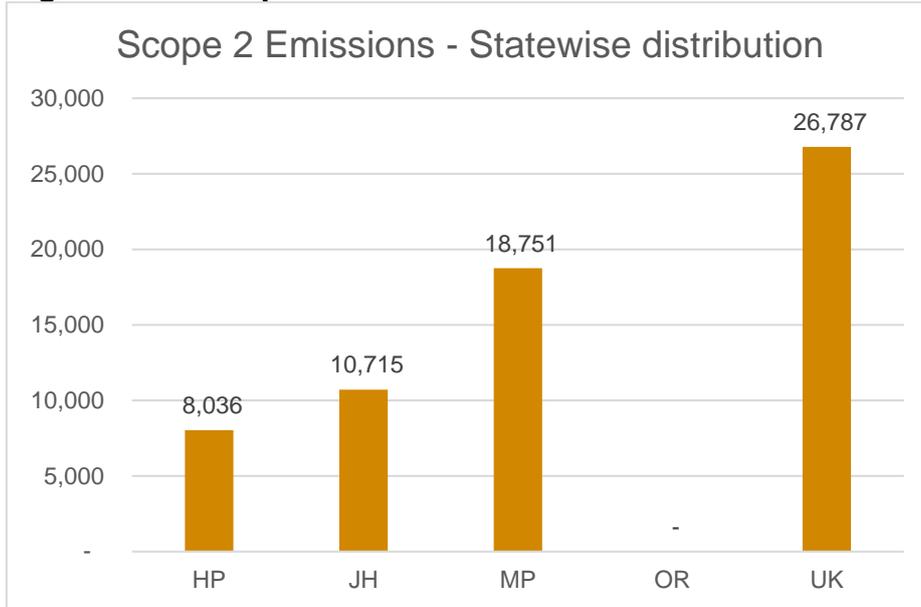
Note: Scope 1 emissions from LDO have been calculated using the consumption data PTS_Dairy Plant_6 LLPD.xlsx document, which has been used as a proxy for all the dairy processing sites due to unavailability of data. Extrapolating from one plant / site to 24 others with no consideration for processing capacity variances is less than ideal and should be remedied for future engagements.

3.4.2 Scope 2 GHG Emissions

Scope 2 emissions accounted for **64,288 tonnes** of CO₂-eq emissions across the four states Himachal Pradesh, Jharkhand, Madhya Pradesh, and Uttarakhand in NDDB's Milk chain. There is no electricity consumption data for Orissa as no data has been received for number of dairy processing plants in the state.

The State wise distribution of Scope 2 emissions are shown in **Error! Reference source not found..**

Figure 1.4 Scope 2 GHG Emissions State wise Distribution



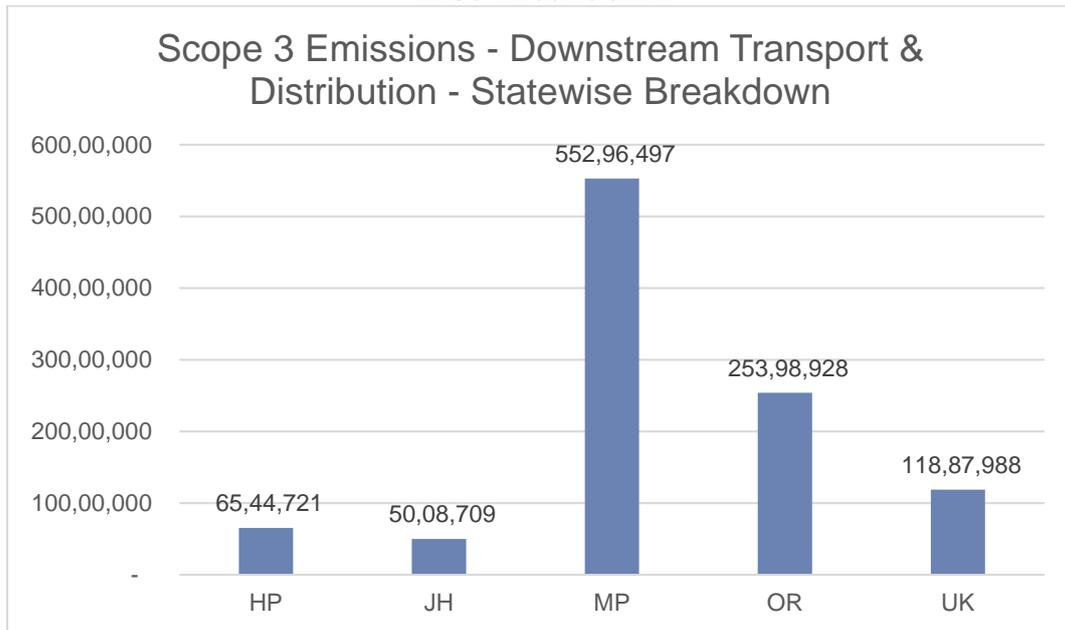
Note: Scope 2 emissions from electricity consumption have been calculated using the consumption data PTS_Dairy Plant_6 LLPD.xlsx document, which has been used as a proxy for all the dairy processing sites due to unavailability of data. Extrapolating from one plant / site to 24 others with no consideration for processing capacity variances is less than ideal and should be remedied for future engagements.

3.5 Scope 3 GHG Emissions

Scope 3 emissions account for **10,41,36,844 tonnes** of CO₂-eq emissions across the five states (Himachal Pradesh, Jharkhand, Madhya Pradesh, Odisha, and Uttarakhand) in dairy and milk chain. Scope 3 emissions related to Category 9 Downstream Transport and Distribution have been identified and assessed for this inventory.

The State wise breakdown of Scope 3 Category 9 – Downstream transport and distribution GHG emissions are shown in **Error! Reference source not found.**

Figure 1.5 Scope 3 Emissions - Downstream Transport & Distribution - State wise Breakdown



For calculating Scope 3 GHG emissions from Downstream transport and distribution, data from the Bhopal Milk Union for has been used as a base for calculation. Emissions intensity per liter of milk was calculated using the number of vehicles, average daily distance traveled by them, and the average daily volume of milk transported. This emissions intensity along with district wise milk procurement data across the five states (Himachal Pradesh, Jharkhand, Madhya Pradesh, Orissa and Uttarakhand) and emissions factor for freighting goods from the DEFRA UK database were used to calculate the Scope 3 GHG emissions for dairy and milk chain.

Note: Projection of emissions from single data-points, which cannot be sense-checked and outliers which can't be eliminated is not ideal. In future, data management and completeness should be prioritized to get an accurate carbon footprint of all states/unions.

3.6 Emissions Intensity of Milk

One of the key tasks of this project was to establish the emissions intensity per liter of milk through the assessment of GHG emissions generated in producing it.

ERM have used the Scope 1 and Scope 2 GHG emissions as a basis for calculating the emissions intensity of milk.

Emissions intensity of milk has been calculated by using the total amount of milk procured across the five states (Himachal Pradesh, Jharkhand, Madhya Pradesh, Orissa, and Uttarakhand) and the Scope 1 and Scope 2 GHG emissions quantities.

$$\text{Emissions intensity} = (\text{Scope 1 emissions} \div \text{total vol. of milk procured}) + (\text{Scope 2 emissions} \div \text{total volume of milk procured})$$

Error! Reference source not found. details the emissions intensity per liter of milk:

Table 1.2: Emissions Intensity per liter of milk

| Emissions Intensity | Emissions (kgCO₂-e)/L |
|----------------------------|---|
| Scope 1 | 0.28 |
| Scope 2 | 0.11 |
| Total | 0.38 |

3.7 Assumptions

ERM have had to use assumptions in the calculation of GHG emissions due to the quality of data and the unavailability or partial availability of data. A majority of the data used for developing NDDB's Scope 1, 2 and 3 GHG emissions inventory has been received in the form of daily averages and estimates or partial data that relates to a single plant or union or state. ERM have put in the best efforts to correlate the available data to relevant data points, best practices and secondary sources which are reputable and recognized, however, the outputs from these assumptions cannot be deemed 100% accurate, but a broad estimate of the emissions profile for dairy and milk chain.

To achieve a more accurate representation of their emissions profile, we recommend that NDDB and their stakeholders that have been assessed should prioritize data management. Data management includes the periodical and timely collection of data as opposed to collecting data at the end of the year, implementing a data management plan with persons responsible and accountable for the collection of primary data as opposed to daily averages as there are seasonal peaks and troughs in the production and sale of milk and associated dairy products.

A key recommendation would be recording data related to land use change as it is a significant contributor to GHG emissions in the dairy sector.

4. GHG EMISSIONS REDUCTION MEASURES / MITIGATION STRATEGIES

ERM have identified the following GHG emissions reduction measure / mitigation strategies that build on the GHG mitigation strategies and renewable solutions being considered by NDDB in the NDSP II project.

4.1 Up-to-Farm gate

4.1.1 Short term (less than 5 years)

Development of Anti-methanogenic pastures

Anti-methanogenic pastures are a type of pasture or grazing land that is designed to reduce the amount of methane emissions produced by livestock. Methane is a potent greenhouse gas that is produced by the digestive processes of ruminant animals like cattle, sheep, and goats. Anti-methanogenic pastures are typically made up of a variety of plants that have been selected for their ability to reduce methane emissions from livestock.

These pastures typically contain a mix of forage species, such as legumes and grasses, that are high in tannins or other compounds that can reduce methane production in the rumen of the animals. For example, legumes such as birdsfoot trefoil, sainfoin, and alfalfa have been found to be effective in reducing methane emissions from livestock, while grasses such as tall fescue and ryegrass have also been shown to have anti-methanogenic properties

NDDB can look to development of such pastures to reduce the enteric fermentation emissions arising from enteric methane which account for a significant portion of their Scope 1 emissions.

Optimizing Manure management practice in Arid region

The high contribution of nitrous oxide to the emissions of extensive systems in the arid and humid regions is mainly caused by the deposition of dung and urine in pastures, due to the long grazing time for the animals, and due to dry lot manure storage (15 to 20 percent, compared to less than 5 percent in the extensive systems of the arid and humid zones).

Where feasible, NDDB should look at optimizing and changing manure management in arid regions which could be effective to reduce Scope 1 emissions arising from the enteric methane found in manure.

4.1.2 Medium term (5-10 years)

Focus on Carbon sequestration: trees

Planting trees can be a useful way to offset livestock methane emissions because trees absorb GHGs from the atmosphere and store it in their biomass through a process known as carbon sequestration. This means that as trees grow, they can help to remove greenhouse gases from the atmosphere, including carbon dioxide and Methane.

To offset the methane emissions from livestock with trees, it is important to calculate the amount of methane produced by the livestock and the amount of carbon sequestered by the trees. The carbon sequestration potential of trees can vary depending on the species of tree, the age of the tree, and the local growing conditions, so it is important to use accurate estimates for the amount of carbon that will be sequestered.

There are various programs and initiatives that allow farmers and ranchers to participate in reforestation and afforestation projects to offset their greenhouse gas emissions. For example, some governments offer carbon offset programs that enable farmers to earn credits by planting trees on their land. These credits can then be sold to companies or individuals who want to offset their own greenhouse gas emissions. The potential suitability of planting trees for carbon sequestration to offset emissions is largely dependent on factors such as the availability of land, rainfall and the impact that tree planting will have on agricultural land (Doran-Browne, 2018).

NDDB should focus on these afforestation and reforestation efforts as Land Use Change is a significant source of Scope 1 emissions in Dairy farming. Offsets and carbon sequestration can also actively reduce the farm-level GHG impacts.

Emphasizing Carbon sequestration: Soil

Carbon sequestration in soil refers to the process of capturing carbon from the atmosphere and storing it in the soil. Soils can store significant amounts of carbon in the form of organic matter, which is made up of plant and animal residues that decompose and become incorporated into the soil. The carbon in organic matter can remain in the soil for many years or even centuries, depending on the soil type, climate, and management practices.

NDDB can look at the following methods to increase carbon sequestration in soil, including:

1. *Conservation tillage*: This involves reducing the amount of disturbance to the soil during planting and other field operations. By leaving more crop residues on the soil surface and reducing tillage, more organic matter can accumulate in the soil.
2. *Cover cropping*: Planting cover crops during fallow periods or in between cash crops can help to maintain living roots in the soil and promote the buildup of organic matter.
3. *Rotational grazing*: Managing livestock to graze pastures in a way that promotes healthy grass growth can also increase carbon sequestration in soil. This is because the grass roots can store

carbon below ground, and the manure deposited by the animals can also add organic matter to the soil.

4. *Agroforestry*: Incorporating trees into agricultural landscapes can increase the amount of carbon stored in soil and biomass. Trees can add organic matter to the soil, provide shade for crops, and help to reduce erosion.

Carbon sequestration through soil not only creates natural carbon sinks but also induce other benefits such as improving soil health and fertility, reducing soil erosion, and increasing water retention. As such, it is an important strategy for creating more sustainable and resilient agricultural systems that can help to mitigate climate change.

This is another means of offsetting dairy and milk chain related emissions from fodder production can be feasible at scale in the medium term through interventions and educational drives for EIAs and farmers

4.1.3 Long term

Change in Housing systems

The housing system for bovine livestock can play an important role in mitigating nitrous oxide (N₂O) emissions. Here are some housing strategies that can help to reduce N₂O emissions in bovine:

1. *Adequate ventilation*: Proper ventilation in housing facilities can help to reduce ammonia buildup, which can lead to N₂O emissions. Adequate ventilation can also help to reduce the risk of respiratory disease in bovine, which can improve animal health and productivity.
2. *Housing design*: Housing design can also play a role in reducing N₂O emissions. For example, providing adequate space for animals can help to reduce stress and improve animal health, which can lead to more efficient nutrient use and reduced N₂O emissions. Additionally, housing facilities that allow for proper manure management can help to reduce the amount of nitrogen in manure, which can lead to reduced N₂O emissions.
3. *Flooring and bedding*: The type of flooring and bedding used in housing facilities can also affect N₂O emissions. Bedding materials that absorb moisture and reduce ammonia buildup, such as straw or wood chips, can help to reduce N₂O emissions. Additionally, flooring that allows for proper drainage and manure management can reduce the risk of N₂O emissions.

4.2 Post Gate

Improving Energy efficiency of processing plant

Dairy processing facilities can improve their energy efficiency by implementing measures such as upgrading equipment, optimizing processes, and improving insulation. This can help to reduce energy consumption and lower GHG emissions. Electrified machinery, automatization and Artificial Intelligence, together have the potential to dramatically improve efficiency at building sites. These and other technologies such as innovative, low-carbon materials, energy storage solutions and smart buildings, can GHG reduce emissions significantly.

Switching to Renewable energy

Switching to renewable energy sources, such as solar or wind power, can help to reduce GHG emissions from dairy processing. This can be achieved through on-site generation, purchasing green energy credits, or entering into power purchase agreements with renewable energy providers. The biogas produced from manure can itself be used to generate electricity and heat for the processing plant.

Using Sustainable Transportation

Transportation of dairy products can also contribute to GHG emissions. POI/ IA can reduce transportation-related emissions, like reducing the distance between processing facilities and markets, using more efficient modes of transportation, and implementing supply chain optimization measures etc to reduce their emissions from carbon. Sustainable fuel can be used for the transportation such as EVs or biofuels.

5. REFERENCES

- Doran-Browne, N. W. (2018). Offsets Required to Reduce the Carbon Balance of Sheep and Beef Farms through Carbon Sequestration in Trees and Soils. *Animal Production Science*, 1648–1655. doi:<https://doi.org/10.1071/AN16438>
- T.V. Ramachandra, B. H. (2015). *GHG footprint of Major cities in India, Renewable and Sustainable Energy Reviews*. Retrieved from Energy and Wetlands Research Group, Centre for Ecological Sciences (CES), Indian Institute of Science, Bangalore: https://wgbis.ces.iisc.ac.in/energy/paper/GHG_footprint/methods.html

APPENDIX R: FORM 'A' ENVIRONMENTAL AND SOCIAL CHECKLIST FOR SUB-PROJECTS

FORM A: Environmental and Social Checklist for Subprojects

This form is to be used by the IAs and after completing the required process submit this form with the sub project proposal to the PMU.

(Note: One copy of this form and accompanying documentation to be kept in the PMU office.)

Project Title :
 Subproject Title :
 Proposing POI's Name & Address :
 Subproject Location :
 Subproject Estimated Cost :
 Date of Screening :

| Description of Activities: | | | | |
|----------------------------|---|-----|----|---------|
| S. No | Questions | Yes | No | Remarks |
| 1. | Land related information | | | |
| a. | Is the sub-project needed land? | | | |
| b. | If yes, POIs/ IA has the land for their own? | | | |
| c. | If no, POIs/ IA need to procure the required land (direct purchase/ lease) | | | |
| d. | Provide the estimated land needs to be procured, ownership, and land use (private land/ scheduled caste community members/ forest land/ required economic displacement/ and physical displacement). | | | |
| 2. | Water resource | | | |
| a. | Is the sub-project required water? | | | |
| b. | If yes, does it need to be sourced from groundwater? | | | |
| c. | If yes, is the sub-project located in an area of groundwater scarcity (critical or over-exploited)? | | | |
| d. | Is the sub-project considered a water conservation measure? | | | |
| 3. | Surface water quality | | | |
| a. | Is the sub-project's potential to generate waste water from processing, washing, etc. | | | |
| b. | If yes, the project has considered any waste water treatment facility or plant. | | | |
| 4, | Fuel use and GHG emission | | | |
| a. | Is the sub-project requiring fossil fuel for power generation or to meet the energy requirement in diary processing? | | | |
| b. | If yes, has the project considered any alternative energy (solar power) or any energy conservation measures? | | | |
| 5. | Ecology & biodiversity | | | |
| a. | Is the sub-project located in proximity to a natural forest/ wildlife sanctuary/ national park/ eco-sensitive zone? | | | |

| | | | | |
|----|--|--|--|--|
| 6. | Socio-economic | | | |
| a. | Is there a likelihood of gender-based discrimination as a result of the sub-project? | | | |
| b. | Is there a likelihood of discrimination against any or all vulnerable groups (SC, ST, socially backward tribes, population located in remote districts, female-headed households, and adolescent girls from poor families) as a result of the project? | | | |
| C. | Would the project potentially reproduce discrimination against women based on gender, especially regarding access to assets and benefits? | | | |
| d. | Is there a probability of adverse impacts on livelihoods and associated losses? | | | |
| e. | Are any of them poor, female heads of households, or vulnerable to poverty risks? Provide some estimate. | | | |
| 7. | Occupational health & safety | | | |
| a. | Is there a high risk to the overall safety and security of workers involved in the sub-project? | | | |
| 8. | Community health & safety | | | |
| a. | Is there a high risk to the overall safety and security of local community from the sub-project? | | | |

**APPENDIX S: ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST
FOR SUB-PROJECTS AT PMU LEVEL**

ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST FOR SUBPROJECTS AT PMU LEVEL

This Form is to be used by the Project Management Unit (PMU) in Screening Subproject Applications.

(Note: One copy of this form and accompanying documentation to be kept in the PMU office.)

Name of Subproject:

Proposing IA :

Subproject Location:

Estimated Cost:

Proposed Date of Commencement of Work:

Checklist for Screening of Sub Projects by PMU

| S. No | E& S related issues | Yes | No | Remarks |
|-------|---|-----|----|---------|
| 1. | Whether the sub-project conducted the E&S screening. What is the categorization of the sub-project (high risk, substantial risk, moderate risk, or low risk)? | | | |
| 2 | In the case of a low-risk sub-project, the project has included the mitigation measures outlined in the ESMF. | | | |
| 3 | In the case of a moderate-risk sub-project, the project has identified the risk/ impacts, included the ESMP. | | | |
| 4 | In the case of a substantial-risk sub-project: <ul style="list-style-type: none"> The project has conducted an ESIA study through a consultant. The project has prepared an ESMP. The project has conducted stakeholder consultation at various stages of the ESIA study. The project has conducted a public disclosure meeting. The project DPR has included all the E&S mitigation measures in the project design. | | | |
| 5 | In the case of a major-risk sub-project: <ul style="list-style-type: none"> The project has conducted an ESIA study through a consultant. The project has prepared an ESMP. The project has conducted stakeholder consultation at various stages of the ESIA study. The project has conducted a public disclosure meeting. The project DPR has included all the E&S mitigation measures in the project design. | | | |

The sub project has been screened for E&S issues and on the basis of impact categorization it falls into:

| | |
|------------------|--|
| Low Risk | <ul style="list-style-type: none">• Good Practices and SOP to be followed |
| Moderate Risk | <ul style="list-style-type: none">• Relevant Mitigation Measures as art of ESMF to be incorporated |
| Substantial Risk | <ul style="list-style-type: none">• Stand alone ESIA suggested. To be reviewed again after submission of ESIA report and ESMP, and be given clearance. |
| Major | <ul style="list-style-type: none">• Stand alone ESIA suggested. To be reviewed again after submission of ESIA report and ESMP, and be given clearance. |

Signed by PMU:
Manager:

Signed by Project

Title:
Date:

Title:
Date:

Appendix T: WHO Recommended Classification of Pesticides by Hazard

Table 1. Extremely hazardous (Class Ia) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|-----------------------------|------------|-------|-----------|------------|----------|-----|------------------------|--|
| Parathion [ISO] | 56-38-2 | 3018 | OP | L | I | 2 | 13 | See note 3; HSG 74; IARC 112 (Group 2B); ICSC 6; JMPR 1995; High case fatality reported – see note 6 |
| Parathion-methyl [ISO] | 298-00-0 | 3018 | OP | L | I | 2 | 14 | See note 3; EHC 145; HSG 75; ICSC 626; JMPR 1984, 1995 |
| Phenylmercury acetate [ISO] | 62-38-4 | 1674 | HG | S | FST | 2 | 24 | Adjusted classification; see notes 3 and 7; ICSC 540 |
| Phorate [ISO] | 298-02-2 | 3018 | OP | L | I | 1 | 2 | See note 3; JMPR 1996, 2004; ICSC 1060 |
| Phosphamidon | 13171-21-6 | 3018 | OP | L | I | 2 | 7 | See note 3; ICSC 189; JMPR 1986 |
| Sodium fluoroacetate [C] | 62-74-8 | 2629 | | S | R | 1 | 0.2 | ICSC 484 |
| Sulfotep [ISO] | 3689-24-5 | 1704 | OP | L | I | 1 | 5 | ICSC 985 |
| Tebupirimfos [ISO] | 96182-53-5 | 3018 | OP | L | I | 1 | 1.3 | Extremely hazardous by skin contact (LD ₅₀ 9.4 mg/kg in rats); ICSC 1767 |
| Terbufos [ISO] | 13071-79-9 | 3018 | OP | L | I-S | 1 | c2 | ICSC 1768; JMPR 1990, 2003 |

EHC = Environmental Health Criteria Monograph; HSG = Health and Safety Guide; IARC = IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; ICSC = International Chemical Safety Card; JMPR = Evaluation by the Joint FAO/WHO Meeting on Pesticide Residues.

Notes to Class Ia

1. Calcium cyanide is in Class Ia as it reacts with moisture to produce hydrogen cyanide gas. *Hydrogen cyanide is fatal if swallowed, in contact with skin or if inhaled (ICSC 492).*
2. Captafol is carcinogenic in both rats and mice.
3. The international trade of *aldicarb*, captafol, hexachlorobenzene, mercury compounds, parathion, parathion-methyl, *phorate* and phosphamidon is regulated by the Rotterdam Convention on Prior Informed Consent (see <http://www.pic.int/>), which entered into force on 24 February 2004 and has subsequently been amended. See table 7, p. 65
4. EPN has been reported as causing delayed neurotoxicity in hens.
5. Hexachlorobenzene has caused a serious outbreak of porphyria in humans. The use and production of hexachlorobenzene is severely restricted by the Stockholm Convention on persistent organic pollutants (see <http://www.pops.int/>), which entered into force on 17 May, 2004 and has subsequently been amended.
6. *A high case fatality has been reported in poisoning cases with this substance (Dawson et al, 2010).*
7. Phenylmercury acetate is highly toxic to mammals and very small doses have produced renal lesions: teratogenic in the rat.

Table 2. Highly hazardous (Class Ib) technical grade active ingredients in pesticides

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|------------------------------|--------------|-------|-----------|------------|----------|-----|------------------------|---|
| Abamectin [ISO] | 71751-41-2 | 2588 | | S | AC,I,N | 2 | 8.7 | JMPR 2015 |
| Acrolein [C] | 107-02-8 | 1092 | | L | H | 2 | 29 | EHC 127; HSG 67; ICSC 90 |
| Allyl alcohol [C] | 107-18-6 | 1098 | | L | H | 3 | 64 | Highly irritant to skin and eyes; ICSC 95; Adjusted classification (see note 3) |
| Azinphos-ethyl [ISO] | 2642-71-9 | 2783 | OP | S | I | 2 | 12 | JMPR 1973 |
| Azinphos-methyl [ISO] | 86-50-0 | 2783 | OP | S | I | 2 | 16 | See note 2; ICSC 826; JMPR 1992, 2007 |
| Blasticidin-S | 2079-00-7 | 2588 | | S | F | 2 | 16 | ICSC 1758 |
| Bromophos-ethyl [ISO] | 4824-78-6 | | OP | L | I | 3 | 71 | Adjusted classification (see note 3) |
| Butocarboxim [ISO] | 34681-10-2 | 2992 | C | L | I | 3 | 158 | JMPR 1985; Adjusted classification (see note 3) |
| Butoxycarboxim [ISO] | 34681-23-7 | 2992 | C | L | I | 3 | D288 | Adjusted classification (see note 3) |
| Cadusafos [ISO] | 95465-99-9 | 3018 | OP | L | N,I | 2 | 30 | JMPR 2009 |
| Calcium arsenate [C] | 7778-44-1 | 1573 | AS | S | I | 2 | 20 | EHC 18, 224; IARC 84 (see note 5); ICSC 765; JMPR 1969 |
| Carbofuran [ISO] | 1563-66-2 | 2757 | C | S | I | 2 | 8 | See note 2; ICSC 122; JMPR 1996, 2002, 2008 |
| Chlorfenvinphos [ISO] | 470-90-6 | 3018 | OP | L | I | 2 | 31 | ICSC 1305; JMPR 1994 |
| 3-Chloro-1,2-propanediol [C] | 96-24-2 | 2689 | | L | R | 3 | 112 | IARC 101 (Group 2B); ICSC 1664; Adjusted classification (see notes 1 and 3) |
| Coumaphos [ISO] | 56-72-4 | 2783 | OP | S | AC,MT | 2 | 7.1 | ICSC 422; JMPR 1990 |
| Coumatetralyl [ISO] | 5836-29-3 | 3027 | CO | S | R | 2 | 16 | |
| Cyfluthrin [ISO] | 68359-37-5 | | PY | S | I | 2 | c15 | ICSC 1764; JMPR 2006; See note 4 |
| Beta-cyfluthrin [ISO] | 1820573-27-0 | | PY | S | I | 2 | c11 | JMPR 2006; See note 4 |

Table 2. Highly hazardous (Class Ib) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|------------------------|------------|-------|-----------|------------|----------|-----|------------------------|---|
| Demeton-S-methyl [ISO] | 919-86-8 | 3018 | OP | L | I | 2 | 40 | EHC 197; ICSC 705; JMPR 1989 |
| Dichlorvos [ISO] | 62-73-7 | 3018 | OP | L | I | 3 | 57-108 | Volatile; EHC 79; HSG 18; IARC 53 (Group 2B); ICSC 690; JMPR 1993, 2011; Adjusted classification (see note 3) |
| Dicrotophos [ISO] | 141-66-2 | 3018 | OP | L | I | 2 | 22 | ICSC 872 |
| Dinoterb [ISO] | 1420-07-1 | 2779 | NP | S | H | 2 | 25 | |
| DNOC [ISO] | 534-52-1 | 1598 | NP | S | I-S,H | 2 | 25 | JMPR 1965a; EHC 220; ICSC 462. See note 2. |
| Edifenphos [ISO] | 17109-49-8 | 3018 | OP | L | F | 3 | 150 | JMPR 1981. Adjusted classification (see note 3) |
| Ethiofencarb [ISO] | 29973-13-5 | 2992 | C | L | I | 3 | 200 | ICSC 1754; JMPR 1982. Adjusted classification (see note 3) |
| Famphur | 52-85-7 | 2783 | OP | S | I | 2 | 48 | |
| Fenamiphos [ISO] | 22224-92-6 | 2783 | OP | S | N | 2 | 15 | ICSC 483; JMPR 1997, 2002 |
| Flucythrinate [ISO] | 70124-77-5 | 3352 | PY | L | I | 3 | c67 | JMPR 1985; see note 4; Adjusted classification (see note 3) |
| Fluoroacetamide [C] | 640-19-7 | 2588 | | S | R | 2 | 13 | ICSC 1434. See note 2 |
| Formetanate [ISO] | 22259-30-9 | 2757 | C | S | AC | 2 | 21 | |
| Furathiocarb | 65907-30-4 | 2992 | C | L | I-S | 2 | 42 | |
| Heptenophos [ISO] | 23560-59-0 | 3018 | OP | L | I | 3 | 96 | Adjusted classification (see note 3) |
| Isoxathion [ISO] | 18854-01-8 | 3018 | OP | L | I | 3 | 112 | Adjusted classification (see note 3) |
| Lead arsenate [C] | 7784-40-9 | 1617 | AS | S | L | 2 | c10 | EHC 18, 224; ICSC 911; JMPR 1969 |
| Mecarbam [ISO] | 2595-54-2 | 3018 | OP | Oil | I | 2 | 36 | ICSC 1755; JMPR 1986 |
| Mercuric oxide [ISO] | 21908-53-2 | 1641 | HG | S | O | 2 | 18 | ICSC 981; CICAD 50. See note 2 |
| Methamidophos [ISO] | 10265-92-6 | 2783 | OP | S | I | 2 | 30 | HSG 79; ICSC 176; JMPR 1990, 2002; See note 2 |
| Methidathion [ISO] | 950-37-8 | 3018 | OP | L | I | 2 | 25 | ICSC 1659; JMPR 1997 |

Table 2. Highly hazardous (Class Ib) technical grade active ingredients in pesticides (cont.)

EHC = Environmental Health Criteria Monograph; HSG = Health and Safety Guide; IARC = IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; ICSC = International Chemical Safety Card; JMPR = Evaluation by the Joint FAO/WHO Meeting on Pesticide Residues.

Notes to Class Ib

1. 3-Chloro-1,2-propanediol in nonlethal dosage is a sterilant for male rats. This compound is also known as alpha-chlorohydrin.
2. The international trade of *azinphos-methyl*, carbofuran, DNOC, fluoroacetamide, mercury compounds, methamidophos, monocrotophos and pentachlorophenol is regulated by the Rotterdam Convention on Prior Informed Consent (see <http://www.pic.int/>), which entered into force on 24 February 2004 and has subsequently been amended. See table 7, p. 65. *In addition, the production and use of pentachlorophenol and its salts and esters are strictly limited by the Stockholm Convention on persistent organic pollutants (see <http://www.pops.int/>), which entered into force on 17 May, 2004 and has subsequently been amended.*
3. As a precautionary measure, the classification of certain liquid pesticides has been adjusted to avoid those pesticides being assigned to a less hazardous Class in the process of aligning the WHO Classification with the GHS. Details of how the WHO Classification has been aligned with the GHS Acute Toxicity Hazard Categories are described in the introductory notes for Part II.
4. *The toxicity data for pyrethroids is highly variable according to isomer ratios, the vehicle used for oral administration, and the husbandry of the test animals e.g. fasting prior to dosing. The variability is reflected in the prefix 'c' before LD₅₀ values. The single LD₅₀ value chosen for classification purposes is generally based on administration in corn oil and can be much lower than that in aqueous solutions. This underlines the need for classification by formulation if the classification is to reflect true hazard.*
5. *IARC Monograph 84 concluded that there was **limited evidence** in experimental animals for the carcinogenicity of calcium arsenate and sodium arsenite (IARC 84).*
6. *A high case fatality has been reported in poisoning cases with this substance (Dawson et al, 2010).*

Table 3. Moderately hazardous (Class II) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|----------------------------|-------------|-------|-----------|------------|----------|-----|------------------------|--|
| Bioallethrin [C] | 260359-57-7 | | PY | L | I | 4 | c700 | See notes 2 and 10; ICSC 227 |
| Bis(tributyltin) oxide [C] | 56-35-9 | | | L | F,M | 3 | 194 | See note 3; EHC 15; Irritant to skin |
| Bromofenoxim [ISO] | 13181-17-4 | | | S | H | 4 | 1217 | |
| Bromophos [ISO] | 2104-96-3 | | OP | S | I | 4 | c1600 | |
| Bromoxynil [ISO] | 1689-84-5 | 2588 | | S | H | 3 | 190 | |
| Bromuconazole | 116255-48-2 | | | S | F | 4 | 365 | ICSC 1264 |
| Bronopol | 52-51-7 | 3241 | | S | B | 3 | 254 | ICSC 415 |
| Butamifos [ISO] | 36335-67-8 | | OP | L | H | 4 | 630 | |
| Butralin [ISO] | 33629-47-9 | | | S | H | 4 | 1049 | |
| Butoxydim [ISO] | 138164-12-2 | | | S | H | 4 | 1635 | |
| Butylamine [ISO] | 13952-84-6 | 1992 | | L | F | 4 | 380 | Irritant to skin; ICSC 401; JMPR 1981, 1984 |
| Carbaryl [ISO] | 63-25-2 | 2757 | C | S | I | 3 | c300 | EHC 153; HSG 78; ICSC 121; JMPR 1996, 2000, 2001 |
| Carbosulfan [ISO] | 55285-14-8 | 2992 | C | L | I | 3 | 250 | JMPR 1986, 2003; High case fatality reported – see note 15 |
| Cartap [ISO] | 15263-53-3 | | TC | S | I | 4 | 325 | EHC 76; JMPR 1995; Usually used in the form of cartap hydrochloride (CAS 15263-52-2) |
| Chloralose [C] | 15879-93-3 | | | S | R | 4 | 400 | |
| Chlordane [ISO] | 57-74-9 | 2996 | OC | L | I | 4 | 460 | See notes 3 and 4; EHC 34; HSG 13; IARC 79 (Group 2B); ICSC 740; JMPR 1994 |
| Chlorfenac [ISO] | 85-34-7 | | OC | S | H | 4 | 575 | |
| Chlorfenapyr [ISO] | 122453-73-0 | | | S | I,MT | 4 | 441 | |
| Chlormequat chloride [ISO] | 999-81-5 | | | S | PGR | 4 | 433 | ICSC 781; JMPR 1997, 1999, 2017 |
| Chloroacetic acid [C] | 79-11-8 | 1751 | | S | H | 4 | 650 | Irritant to skin and eyes; data refer to sodium salt; ICSC 235 |

Table 3. Moderately hazardous (Class II) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|----------------------|-------------|-------|-----------|------------|----------|-----|------------------------|---|
| Cyproconazole | 94361-06-5 | | | S | F | 4 | 1020 | |
| 2,4-D [ISO] | 94-75-7 | 3345 | PAA | S | H | 4 | 375 | EHC 29, 84; HSG 5; IARC 113 (Group 2B); ICSC 33; JMPR 1996 |
| Dazomet [ISO] | 533-74-4 | | | S | F-S | 4 | 640 | Irritant to skin and eyes; ICSC 786 |
| 2,4-DB | 94-82-6 | | | S | H | 4 | 700 | |
| DDT [ISO] | 50-29-3 | 2761 | OC | S | I | 3 | 113 | See notes 3 and 4; EHC 9, 83; IARC 113 (Group 2A); ICSC 34; JMPR 1984, 1994, 2000 |
| Deltamethrin [ISO] | 52918-63-5 | 3349 | PY | S | I | 3 | c135 | See note 10; EHC 97; HSG 30; IARC 53 (Group 3); ICSC 247; JMPR 2000 |
| Diazinon [ISO] | 333-41-5 | 3018 | OP | L | I | 4 | 300 | EHC 198; IARC 112 (Group 2A); ICSC 137; JMPR 1993, 2001, 2006, 2016 |
| Dicamba [ISO] | 1918-00-9 | | | S | H | 4 | 1707 | ICSC 139 |
| Dichlorobenzene [C] | 106-46-7 | | | S | FM | 4 | 500-5000 | Mixture of isomers: ortho (3) 95-50-1, meta (3) 541-73-1, para (2B) 106-46-7; ICSC 37 |
| Dichlorophen [ISO] | 97-23-4 | | OC | S | F | 4 | 1250 | |
| Dichlorprop [ISO] | 120-36-5 | | | S | H | 4 | 800 | ICSC 38 |
| Diclofop [ISO] | 40843-25-2 | | | S | H | 4 | 565 | |
| Dicofol [ISO] | 115-32-2 | | OC | S | AC | 4 | c690 | See note 4; IARC 30 (Group 3); ICSC 752; JMPR 1992, 2011 |
| Difenoconazole [ISO] | 119446-68-3 | | | S | F | 4 | 1453 | JMPR 2007 |
| Difenzoquat [ISO] | 43222-48-6 | 2588 | | S | H | 4 | 470 | |
| Dimepiperate [ISO] | 61432-55-1 | | TC | S | H | 4 | 946 | |
| Dimethachlor [ISO] | 50563-36-5 | | | S | H | 4 | 1600 | |
| Dimethipin [ISO] | 55290-64-7 | | | S | H | 4 | 1180 | JMPR 1999, 2004 |

Table 3. Moderately hazardous (Class II) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|-------------------------|-------------|-------|-----------|------------|----------|-----|------------------------|---|
| Fenobucarb | 3766-81-2 | | C | S | I | 4 | 620 | |
| Fenothiocarb [ISO] | 62850-32-2 | | C | S | L | 4 | 1150 | |
| Fenpropidin [ISO] | 67306-00-7 | | | L | F | 4 | 1440 | |
| Fenpropathrin [ISO] | 39515-41-8 | 3349 | PY | S | I | 3 | c66 | See note 10; JMPR 1993, 2012 |
| Fenpyroximate [ISO] | 134098-61-6 | | | S | AC | 3 | 245 | Highly toxic by inhalation (LC ₅₀ = 0.21-0.36 mg/l); JMPR 2007, 2017 |
| Fenthion [ISO] | 55-38-9 | 3018 | OP | L | I,L | 3 | D586 | ICSC 655; JMPR 1997; High case fatality reported – see note 15 |
| Fentin acetate[(ISO)] | 900-95-8 | 2786 | OT | S | F | 3 | 125 | EHC 15; JMPR 1991; CICAD 13 |
| Fentin hydroxide[(ISO)] | 76-87-9 | 2786 | OT | S | F | 3 | 108 | EHC 15; ICSC 1283; JMPR 1991; CICAD 13 |
| Fenvalerate [ISO] | 51630-58-1 | 3352 | PY | L | I | 4 | c450 | See note 10; EHC 95, HSG 34; IARC 53 (Group 3); ICSC 273; JMPR 1986, 2012 |
| Ferimzone [ISO] | 89269-64-7 | | | S | F | 4 | 725 | |
| Fipronil | 120068-37-3 | 2588 | | S | I | 3 | 92 | JMPR 1997, 2000; ICSC 1503 |
| Flonicamid [ISO] | 158062-67-0 | | | S | I | 4 | 884 | JMPR 2015 |
| Fluchloralin [ISO] | 33245-39-5 | | | S | H | 4 | 1550 | |
| Fluensulfone [ISO*] | 318290-98-1 | | | L | N | 4 | 671 | JMPR 2013, 2016 |
| Flufenacet [ISO] | 142459-58-3 | | | S | H | 4 | 600 | May cause skin sensitization |
| Fluoroglycofen | 77501-60-1 | | | S | H | 4 | 1550 | |
| Flupyradifurone [ISO*] | 951659-40-8 | | | S | I | 3 | 300-2000 | JMPR 2015 |
| Flurprimidol [ISO] | 56425-91-3 | | | S | PGR | 4 | 709 | |
| Flusilazole | 85509-19-9 | | | S | F | 4 | 672 | JMPR 1995, 2007 |

Table 3. Moderately hazardous (Class II) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|--------------------------------|-------------|-------|-----------|------------|----------|-----|------------------------|---------------------------------|
| loxynil [ISO] | 1689-83-4 | 2588 | | S | H | 3 | 110 | ICSC 900 |
| loxynil octanoate [(ISO)] | 3861-47-0 | | | S | H | 4 | 390 | |
| lprobenfos | 26087-47-8 | | | S | F | 4 | 600 | |
| Isoprocarb [ISO] | 2631-40-5 | 2757 | C | S | I | 4 | 403 | |
| Isoprothiolane [ISO] | 50512-35-1 | | | S | F | 4 | ≥300 | JMPR 2017 |
| Isoproturon [ISO] | 34123-59-6 | | | S | H | 4 | 1800 | |
| Isopyrazam [ISO*] | 881685-58-1 | | PZ | S | F | 4 | C310 | JMPR 2011 |
| Isouron [ISO] | 55861-78-4 | | | S | H | 4 | 630 | |
| Lambda-cyhalothrin – see above | | | | | | | | |
| Lindane – see Gamma-HCH | | | | | | | | |
| MCPA [ISO] | 94-74-6 | | PAA | S | H | 4 | 700 | IARC 30, 41 (Group 2B); ICSC 54 |
| MCPA-thioethyl [ISO] | 25319-90-8 | | PAA | S | H | 4 | 790 | |
| MCPB [ISO] | 94-81-5 | | | S | H | 4 | 680 | |
| Mecoprop [ISO] | 7085-19-0 | | | S | H | 4 | 930 | ICSC 55 |
| Mecoprop-P [ISO] | 16484-77-8 | | | S | H | 4 | 1050 | |
| Mefluidide [ISO] | 53780-34-0 | | | S | H | 4 | 1920 | |
| Mepiquat [ISO] | 15302-91-7 | | | S | PGR | 4 | 1490 | |
| Mercurous chloride [C] | 10112-91-1 | 2025 | HG | S | F | 3 | 210 | See note 3; ICSC 984; CICAD 50 |
| Metalaxyl [ISO] | 57837-19-1 | | | S | F | 4 | 670 | JMPR 1982, 2002 |
| Metaldehyde [ISO] | 108-62-3 | 1332 | | S | M | 3 | 227 | |
| Metamitron [ISO] | 41394-05-2 | | | S | H | 4 | 1183 | ICSC 1361 |

Table 3. Moderately hazardous (Class II) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|-------------------------|------------|-------|-----------|------------|----------|-----|------------------------|--|
| Octhilinone [ISO] | 26530-20-1 | | | S | F | 4 | 1470 | |
| Oxadixyl | 77732-09-3 | | | S | F | 4 | 1860 | |
| Paclobutrazol [ISO] | 76738-62-0 | | | S | PGR | 4 | 1300 | JMPR 1988 |
| Paraquat [ISO] | 4685-14-7 | 2781 | BP | S | H | 3 | 150 | See note 7; EHC 39; HSG 51; ICSC 5; JMPR 1982, 1985, 1986, 2003; High case fatality reported – see note 15 |
| Pebulate [ISO] | 1114-71-2 | | TC | L | H | 4 | 1120 | |
| Pendimethalin [ISO] | 40487-42-1 | | | S | H | 4 | 1050 | |
| Permethrin [ISO] | 52645-53-1 | 3352 | PY | L | I | 3 | c220 | See note 10; EHC 94; HSG 33; IARC 53 (Group 3); ICSC 312; JMPR 2002 |
| Phenthoate [ISO] | 2597-03-7 | 3018 | OP | L | I | 4 | c400 | JMPR 1984 |
| Phosalone [ISO] | 2310-17-0 | 2783 | OP | S | I | 3 | 120 | ICSC 797; JMPR 1997, 2001 |
| Phosmet [ISO] | 732-11-6 | 2783 | OP | S | I,AC | 3 | 113 | ICSC 543; JMPR 1998, 2003 |
| Phoxim [ISO] | 14816-18-3 | | OP | L | I | 4 | D1975 | JECFA 2000a |
| Piperophos [ISO] | 24151-93-7 | 3018 | OP | oil | H | 4 | 324 | |
| Pirimicarb [ISO] | 23103-98-2 | 2757 | C | S | AP | 3 | 147 | JMPR 1982, 2004 |
| Pirimiphos-methyl [ISO] | 29232-93-7 | | OP | L | I | 4 | 1667 | JMPR 1992, 2006 |
| Prallethrin [ISO] | 23031-36-9 | 3352 | PY | oil | I | 4 | 460 | |
| Prochloraz [ISO] | 67747-09-5 | | | S | F | 4 | 1600 | JMPR 1983, 2001 |
| Profenofos [ISO] | 41198-08-7 | 3018 | OP | L | I | 4 | 358 | JMPR 1990, 2007 |
| Propachlor [ISO] | 1918-16-7 | | | S | H | 4 | 1500 | EHC 147; HSG 77 |
| Propanil [ISO] | 709-98-8 | | | S | H | 4 | c1400 | ICSC 552; High case fatality reported – see note 15 |
| Propiconazole [ISO] | 60207-90-1 | | | L | F | 4 | 1520 | JMPR 1987, 2004 |

Table 3. Moderately hazardous (Class II) technical grade active ingredients in pesticides (cont.)

| Common name | CAS no | UN no | Chem type | Phys state | Main use | GHS | LD ₅₀ mg/kg | Remarks |
|---------------------------|-------------|-------|-----------|------------|----------|-----|------------------------|--|
| <i>Sulfallate [ISO]</i> | 95-06-7 | | | oil | H | 4 | 850 | Irritant to skin and eyes |
| Sulfluramid [ISO] | 4151-50-2 | | | S | I | 4 | 543 | |
| <i>Sulfoxaflor [ISO*]</i> | 946578-00-3 | | | S | I | 4 | 1000 | JMPR 2011 |
| 2,3,6-TBA [ISO] | 50-31-7 | | | S | H | 4 | 1500 | |
| TCA [ISO] (acid) | 76-03-9 | 1839 | | S | | 4 | 400 | See note 8 to Table 4, p. 48; ICSC 586 |
| Tebuconazole [ISO] | 107534-96-3 | | | S | F | 4 | 1700 | JMPR 1994, 2010 |
| Tebufenpyrad [ISO] | 119168-77-3 | | | S | MT | 4 | 595 | |
| Tebuthiuron [ISO] | 34014-18-1 | | | S | H | 4 | 644 | |
| Terbumeton [ISO] | 33693-04-8 | | T | S | H | 4 | 483 | |
| Tetraconazole [ISO] | 112281-77-3 | | | Oil | F | 4 | 1031 | |
| Thiacloprid | 111988-49-9 | | | S | I | 4 | 396 | JMPR 2006 |
| <i>Thiamethoxam [ISO]</i> | 153719-23-4 | | | S | I | 4 | 871 | JMPR 2010 |
| <i>Thiazafluron [ISO]</i> | 25366-23-8 | | | S | H | 3 | 278 | |
| Thiobencarb [ISO] | 28249-77-6 | | TC | L | H | 4 | 1300 | |
| Thiocyclam [ISO] | 31895-22-4 | | | S | I | 4 | 310 | Refers to thiocyclam oxalate |
| Thiodicarb [ISO] | 59669-26-0 | 2757 | C | S | I | 3 | 66 | JMPR 2000 |
| Thiram [ISO] | 137-26-8 | | | S | F | 4 | 560 | See note 3; EHC 78; IARC 12, 53 (Group 3); ICSC 757; JMPR 1992 |
| Tralkoxydim [ISO] | 87820-88-0 | | | S | H | 4 | 934 | |
| Tralomethrin | 66841-25-6 | 3349 | PY | S | I | 3 | c85 | |
| Triadimefon [ISO] | 43121-43-3 | | | S | F | 4 | 602 | JMPR 1985, 2004 |
| Triadimenol [ISO] | 55219-65-3 | | | S | FST | 4 | 900 | JMPR 1989, 2004 |

Table 3. Moderately hazardous (Class II) technical grade active ingredients in pesticides (cont.)

7. Paraquat has serious delayed effects if absorbed. It is of relatively low hazard in normal use but may be fatal if the concentrated product is taken by mouth or spread on the skin. *May be used as paraquat dichloride (CAS number 1910-42-5).*
8. Mixture of compounds present in *Pyrethrum cineraefolium* and other flowers.
9. Compounds from roots of *Derris* and *Lonchocarpus* spp.
10. *The toxicity data for pyrethroids is highly variable according to isomer ratios, the vehicle used for oral administration, and the husbandry of the test animals e.g. fasting prior to dosing. The variability is reflected in the prefix 'c' before LD₅₀ values. The single LD₅₀ value chosen for classification purposes is generally based on administration in corn oil and can be much lower than that in aqueous solutions. This underlines the need for classification by formulation if the classification is to reflect true hazard.*
11. *LD₅₀ values of <50 mg/kg have sometimes been recorded with lambda-cyhalothrin in studies in mice, but in the context that toxicity data for pyrethroids are highly variable, the LD₅₀ value listed as the critical end-point by the JMPR (JMPR 2007 – based on data in rats) has been used as the basis for the classification.*
12. *No WHO evaluations are available, but detailed evaluations of classification are available from stringent regulatory authorities.*
13. *No WHO evaluations are available. Publications indicate moderate hazard (see for example The Pesticides Manual (2003)).*
14. *Norflurazon was previous classified as "Unlikely to present acute hazard". A subsequent JMPR evaluation concluded that older studies with this substance showing contradictory results could not be relied upon and that norflurazon should be considered to be of moderate acute oral toxicity, based on a study conducted with an 80% formulation (JMPR 2018).*
15. *A high case fatality has been reported in poisoning cases with this substance (Dawson et al, 2010).*

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