Environmental Assessment and Environmental Management Framework for IFPVAP

Gram Samridhi Yojana

16 July 2019 (Volume 1)

Draft

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Glossary

%	Percentage
°C	Degree Celsius
AFI	Apex Financial Institution
APPCB	Andhra Pradesh Pollution Control Board
APDDCF	Andhra Pradesh Dairy Development Cooperative Federation
ATMA	Agricultural Technology Management Agency
BMC's	Bulk Milk Cooling
BMMU's	Block Mission Management Units
BOD	Biochemical Oxygen Demand
CFSFPU	Credit Fund for Small Scale Food Processing Units
CGTMSE	Credit Guarantee Fund Trust for Micro and Small Enterprises
CGWA	Central Ground Water Authority
CII	Confederation of Indian Industry
CPCB	Central Pollution Control Board
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
CRZ	Coastal Regulatory Zones
CTE	Consent to Establish
CTO	Consent to Operate
DAY - NRLM	Deendayal Antyodaya Yojana
DB	Decibel
DG	Diesel Generator
DGET	Directorate General of Employment and Training
DIC	District Industries Centre
DMMU's	District Mission Management Units

EA	Environment Assessment
EC	Empowered Committee
EHS	Environment, Health, Safety
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environment Management Plan
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
Food Food Business Operators Processing Enterprises	
FPO	Farmer Producer Organization
FPI	Food Processing Industry
FSMS	Food Safety Management System
FSSAI	Food Safety and Standards Authority of India
F&V	Fruits and Vegetables
GDP	Gross Domestic Product
GHP	Good Hygienic Practices
GHG	Greenhouse Gas
gm	Gram
GMP	Good Manufacturing Practices
GoI	Government of India
HACCP	Hazard Analysis and Critical Control Point
HC (emissions)	Hydrocarbons
IFC	International Finance Corporation
IIFPT	Indian Institute of Food Processing Technology
MoFPI	Ministry of Food Processing Industries
IFPVAP	India Food Processing and Value Addition Program
IPM	Integrated Pest Management

KL	Kilolitre
KLD	Kilolitre Per Day
LPG	Liquefied Petroleum Gas
MILKFED	Punjab State Cooperative Milk Producers' Federation Ltd
MoEFCC	Ministry of Environment, Forest and Climate Change
MoFPI	Ministry of Food Processing Industries
MPCB	Maharashtra Pollution Control Board
MoRD	Ministry of Rural Development
MSEs	Micro- and Small-Scale Food Processing Enterprises
MSME	Micro Small Medium Enterprises
M&E	Monitoring and Evaluation
MT	Million tons
MTD	Million tons per day
NIFTEM	National Institute of Food Technology Entrepreneurship and Management
NOC	No Objection Certificate
NOx Nitrogen Oxides NO2 Nitrogen Dioxide	
NPA	Non-performing Asset
NPOP	National Program for Organic Production
NRLM	National Rural Livelihoods Mission
NRLPs	National Rural Livelihoods Promotional Society
OY	Oil Year
PAP	Project Affected People
PCB	Pollution Control Board
PDO	Project Development Objective
PGS	Participatory Guarantee System
PIU	Project Implementation Unit
PLI’s	Primary Lending Institutions

PM	Particulate Matter
PMKSY	Pradhan Mantri Kisan Sampada Yojana
PMP	Pest Management Plan
PMU	Project Management Unit
PPCB	Punjab Pollution Control Board
PPE	Personal Protective Equipment
PUC	Pollution Under Control Certificate
R&D	Research & Development
SHG's	Self Help Groups
SME's	Small – Medium Enterprises
SSMU's	State Mission Management Units
SNF	Solids – No - Fats
SPCB	State Pollution Control Board
SPI	Seriously Polluting Industries
SPMU	State Program Management Unit
SOP's	Standard Operating Procedures
SO2	Sulphur Dioxide
SRLM's	State Rural Livelihoods Missions
SSUPs	Strategic State Upgradation Plans
TDS	Total Dissolved Solid
TPD	Tons Per Day
TSS	Total Suspended Solid
UPPCB	Uttar Pradesh Pollution Control Board
USDA	United States Department of Agriculture UNIDO United Nations Industrial Development Organization
VADP	Value Added Dairy Products
VOC	Volatile Organic Compounds
WHO	World Health Organization

Executive Summary

Introduction

i. The Food Processing Industry (FPI) is one of the most promising sectors in India and plays an important role in terms of production, growth, consumption, and export of the country. It is one of the largest industries in India and is ranked fifth in terms of production, consumption, and exports. However, India's food processing industry is highly fragmented with the unorganized sector still a key contributor.

ii. The Ministry of Food Processing Industry and World Bank have proposed the "India Food Processing and Value Addition Program (IFPVAP)" for development of unorganized food processing sector.

iii. The programme aims to modernize and enhance the competitiveness of the micro enterprises through their formalization. Micro enterprises under this programme have been defined as units with investment in plant and machinery of less than INR 25 Lakhs, as defined under the MSME Act, and as amended from time to time.

iv. The key components of the program are:

- Enabling the business environment for the food processing industry
- Strengthening capacities of support providers for food processing enterprises
- Enhancing Food processing micro enterprises to improve performance and competitiveness
- Project Management, Monitoring and Evaluation and Knowledge sharing

v. IFPVAP program once launched will cover all States and Union Territories but will be initially rolled out in states which have taken preparatory steps viz. Andhra Pradesh, Maharashtra, Punjab and Uttar Pradesh.

vi. This study Environmental Assessment (EA) and the resultant Environmental Management Framework (EMF) is expected to guide the IFPVAP project interventions, to ensure that the project activities do not cause any harm and are undertaken in compliance with the applicable national and local regulations, as well as World Bank safeguards policies.

Need, Objective, Approach and Methodology

vii. Environmental Assessment is generally undertaken in order to predict environmental impacts of any development activity and to provide an opportunity to mitigate against negative impacts and enhance positive impacts. Environmental Assessment is management tool for planners and decision makers and complements other project studies, such that beneficial environmental effects are maximized while adverse effects are ameliorated or avoided to the greatest extent possible.

viii. The Environmental Assessment and resultant Environmental Management Framework for IFPVAP will ensure that potential adverse impacts are adequately mitigated and potential benefits of the project are enhanced to improve effectiveness and sustainability of the project. Relevant portions of the EMF will be suitably integrated with project contract documents to facilitate smooth implementation during the rehabilitation and operation phases.

ix. Scope of work (in brief) for the environmental assessment and for the development of environment management frameworks involves:

- Identification of key environmental issues and challenges in relation to proposed project activities at the national level and state level and sample districts of Andhra Pradesh, Maharashtra, Punjab and Uttar Pradesh.

- As part of EA, all four states should be covered with two districts in each, one of which should be an aspirational district.

x. Key components of EMF which is developed as part of this study involves:
    1. Impact Mitigation and Action Plan
    2. Positive Environmental Outcomes
    3. Negative List
    4. Clauses for Inclusion in Bid document
    5. Specific Strategies, Implementation Arrangements and Monitoring Plan
    6. Trainings and Capacity Enhancement
    7. Provisional budget for EMF

xi. The Approach for undertaking the environmental assessment involved following steps:

- Desk Review: The project started with a desk review of the general landscape of food processing industry in India as well as specific to the four target states. It also included a review of a wide range of national and state-specific Laws, Acts and Policies applicable to this project and World Bank safeguard policies.

- Finalizing the categories of food products to be involved in the review: on the basis of secondary research it was observed that the major food categories that can have a large contribution from micro enterprises and unregistered enterprises are: ○ Dairy products ○ Processed Fruits and vegetables ○ Processed grains and oilseeds ○ Processed meat and poultry

○ Other prepared foods/ packaged products such as bakery, papad, snacks and savories

- (Note: During the field survey, we have observed that Meat processing, poultry product processing in value added products and beverage and packaged drinking water segments are not present in units defined by Micro enterprise. They are mostly present in small to medium scale industries due to the nature of investment and workforce required in such plant's operations. Hence the environmental baseline and further assessment is limited to 4 sectors i.e. dairy product processing, fruits and vegetable processing, grains and oilseeds and packaged foods, in line with the target beneficiary group under IFPVAP.)

- Consultation with state nodal bodies to finalize the target districts for review: in order to shortlist the target districts for field survey, consultations were held with state nodal representatives on following aspects:

○ Understanding the prominence of various production clusters and processing clusters based on above five categories in various districts in each state

○ Consultation to understand the state's plan for development activities under IFPVAP ○ On the basis of above consultation, the following districts were identified for field study

Table 1: List of shortlisted districts in participating states for Environmental Assessment

State	Districts	Aspirational District
Andhra Pradesh	Prakasam	Vizianagaram
Maharashtra	Nashik	Washim
Punjab	Sangrur	Moga
Uttar Pradesh	Aligarh	Fatehpur

- Post finalization of districts, field survey were undertaken to review the operational practices, key environmental, health, safety and hygiene concerns for unregistered food processing units. The survey aimed at targeting at least 25 units for each district, spread across different food segments as described above.

- The data collected from secondary sources was complemented by information gathered from field level consultations and survey of food processing units. This was conducted by a multidisciplinary team comprising of experienced sustainability professionals guided by environmental and food processing industry experts. Semi structured interviews were conducted with various institutions such as DIC, FSSAI, Dept. of Agriculture, Nabard, SPCB etc.

- Post consultation and survey, an analysis of the information obtained has been undertaken, which has led to development of this Environmental Assessment and Environmental Management Framework.

Environmental Assessment

xii. Field visits were undertaken in the shortlisted districts on a random basis. A sample of Food Processing Enterprises was drawn on the basis of the list of operators registered with FSSAI, those registered with DC- MSME as micro enterprises. This sample was then consulted with the nodal representatives of nominated state department under IFPVAP. Field visits were undertaken with a view to identify the current food practices and also to assess the current performance of the sample units vis-à-vis environment and health and safety guidelines, and current status of effectiveness of food processing and safety licensing and other relevant regulatory mechanisms in the project area.

xiii. This report described in detail the value chain, key processes and major environmental, health and safety and food safety risks in each of the four food processing sectors. Detailed observations are researched from secondary sources, which is then complimented with information obtained from field survey.

xiv. The review is based on assessment of a total of 172 units spread across different food categories, as described below:

Table 2: Snapshot of the coverage of different category of food processing sector for the Environmental Assessment

S No	Food Processing sector	Number of total units reviewed (across all four states	Type of processes reviewed in target units (unorganized sector)
1	Dairy product processing	33	Packet milk, ghee, butter, lassi, buttermilk, paneer, curd, flavored yoghurt, ice cream
2	Fruits and vegetables processing	26	Pickle, Murraba, jam, sauce, sherbet, jiggery processing, dried and powdered vegetables
3	Grains and oilseed processing	60	Rice mills, oil mills, flour mills, spice processing (multiple), soya milk and tofu processing
4	Packaged food items such as bakery snacks, papad etc.	53	Bakery items (biscuits, bread, cake, buns, rusk etc.), namkeen, popcorn, gajak, chips, papad etc.

xv. A brief summary of key observations regarding potential environmental, health and safety, hygiene and food safety concerns for unorganized units in each of the four food processing sectors is described in the table below (this is based on primary observations during field visits and survey):

Table 3: Snapshot of the regulatory assessment key findings for the Environmental Assessment

S No	Area of concern	Dairy product processing	Fruits and vegetables processing	Grains and oilseed processing	Packaged food items such as bakery snacks, papad etc.
1	Total units covered	33	26	60	53
2	Availability of Consent to operate from state pollution control board	6% 2 instances	0% 0 instances	8% 5 instances	6% 3 instances
3	Non- availability of FSSAI license	42% 14 instances	46% 12 instances	48% 29 instances	55% 29 instances
4	Registration with MSME	12% 4 instances	12% 3 instances	22% 13 instances	17% 9 instances
5	No. of units which did not have any registration at all	39% 13 instances	42% 11 instances	38% 23 instances	49% 26 instances
6	Generation of wastewater and its management	**Dairy product processing:** • The waste water may contain high level of BOD, COD and organic content due to presence of protein, fat, lactose etc. form milk and cleaning agents/detergent. • None of the units have installed any effluent treatment plant, all the units were found discharging the wastewater directly in their drainage system • None of the units have undertaken any testing of their effluent discharge parameters. **Fruits and vegetables processing** • The wastewater may contain high level so of pesticide residue. • None of the unit had any setup for treating waste water. • However, none of the unit are undertaking any wastewater testing before releasing the wastewater. **Grains and oilseed processing:** • The process do not generate any wastewater, except soya processing units. **Packaged food items such as bakery snacks, papad etc.:** • The process do not generate any wastewater.			
7	Management of cleaning chemicals	**All food processing categories:** • The operators were not aware whether cleaning agents and disinfectants is of food grade quality. • The practice of labelling of cleaning agents is weak and in many units they were not being stored in a designated area away from food production			

8	Air emissions and management	**Dairy product processing:** • Diesel fired burners and earthen stoves based on husk, fuel wood etc. are being used for heat generation. Emission from diesel burner may contain NOx, CO, CO_2, HC etc. whereas mission of earthen stoves may contain Particulate Matters, CO_2, CO, NO_2, SO_2. • For power backup, some units were equipped with Diesel Generator Sets. The occasional use of DG sets may cause minute level of emission containing NOx, CO, CO_2 to some extent. • None of the units have undertaken any indoor air quality assessment. • None of the units have undertaken stack emission testing. **Fruits and vegetables processing** • Fruit and vegetable processing do not create any significant air emission or noise generation. Minor emission from the process of burning of fuel (like diesel, organic fuel like husk, wood etc.) for boiling and heating activity is observed.
		Grains and oilseed processing: • No major source or process leading to air emission. **Packaged food items such as bakery snacks, papad etc.:** • No major source or process leading to air emission, however indoor air quality is affected by VOC generation due to yeast (fermentation process).
9	Dust generation and its management	**Dairy product processing:** • No major source or process leading to dust generation. **Fruits and vegetables processing** • No major source or process leading to dust generation. **Grains and oilseed processing:** • Dust arises from storage, handling, drying and milling activities. Milling operation, screening (sieving), grinding, and material handling • Dust production has an impact on the indoor air quality of the unit. None of the workers were found using nose cover or dust mask as a preventive measure. • Most of the milling units were found using a manual dust collection bag attached to the milling machine. However, the presence of this bag does not limit the spread of flour dust within the working area. Only one milling unit (Moga, Punjab) was found using vacuum based dust suppression and cleaning system. **Packaged food items such as bakery snacks, papad etc.:** No major source or process leading to dust generation

10	Physical Hazards	**Dairy product processing:** • Risk of accidental spillage of hot milk/ contact burn during the process of manufacturing various products/handling of hot material filled container. • There is no provision for heat resistance gloves, shoes or aprons in any of the visited units. • Risk of electric shock due to non-grounding/ weak connections of all electrical equipment and installations. There is no schedule of preventive maintenance of insulation level for electrical wires and connections. • Around 22% of units have a congested workspace wherein machines and storage material obstructs walkways and pathways. • About 18% of the units (across all states) have a first aid kit or common first aid equipment like band aids, cotton, gauges, antiseptic and anti-burn creams. Remaining 82 % did not have any provision for treatment of minor injuries. **Fruits and vegetables processing** • Spillage of hot fluid (in the process of making ketchup, sherbet) is possible due to improper handling. • Only 31% of the units (across all states) have a first aid kit or common first aid equipment like band aids, cotton, gauges, antiseptic and anti-burn screams. Remaining 69% did not have any provision for treatment of minor injuries. **Grains and oilseed processing:** • Potential risk from moving part of machinery.
11	Chemical hazards	**Dairy product processing:** • Since the process does not involve usage of any toxic chemicals, there is no risk of exposure to a chemical hazard. **Fruits and vegetables processing** • No significant hazard from chemical or biological factor is observed. **Grains and oilseed processing:** • No significant hazard from chemical or biological factor is observed. **Packaged food items such as bakery snacks, papad etc.:** • No significant hazard from chemical or biological factor is observed.
12	Fire Safety and emergency prevention	**All food processing categories:** • Majority of units did not have any fire prevention mechanism such as stored water or sand bucket etc. • Lack of awareness on risk due to fire as well as adequate preventive mechanisms and evacuation techniques were observed. This is a significant concern area given the congested setting of the workplace. • None of the units have attended any formal fire safety or prevention training. • Most of the units are not aware of regulatory requirements for obtaining a fire NOC.

13	Ergonomics and other risks due to current working practice	**Dairy product processing:** • No such severe ergonomics risk to workers is observed from these type of units. **Fruits and vegetables processing** • No severe ergonomics risk to workers is observed from these units.
14	Inspection of incoming material	**All food processing categories:** • Significant number of units do not perform any sort of testing (chemical, quality, physical inspection) of incoming material. We have observed 17 such units under grains and oilseed, 4 under dairy processing, 8 under fruits and vegetables and 10 under package foods who do not undertake any testing. • For the ones who have testing process, they have not undergone any technical training for undertaking such inspection
15	Pest control and pest management	**All food processing categories:** □ None of the units have established a dedicated pest management program. They mostly install rodent traps as and when required. The units seldom undertake fumigation. There is not external specialist service agency for pest control.
16	Personal hygiene	**All food processing categories:** • 21 units in bakery, 19 in grains and oilseeds, 13 in dairy and 11 units under fruits and vegetable category did not maintain personal hygiene quality standards for their workers. • The workers had soiled clothes, unkempt hairs, nails etc., no usage of handwashing facility or sanitizers before handling food etc.
17	Cleanliness of the facility	**All food processing categories:** □ 23 units in grains and oilseeds, 9 units in dairy, 4 units in fruits and vegetables and 22 units in packaged foods had maintained their facility in untidy manner with dirty floor, uncovered food articles, stagnation of process water inside and outside unit and lack of general hygiene.
18	Lighting and ventilation	**All food processing categories:** □ 10 units in grains and oilseeds, 12 units in packaged foods, 1 unit in dairy did not have adequate lighting conditions.
19	System to implement food recall	**All food processing categories:** • None of the units have developed or implemented any system to propagate food recall. • These units are mostly selling non-labelled and non-branded products to
		domestic consumers. For a limited few who have labelled their products, there is no barcoding mechanism to assist in food recall or traceability.

A note on Energy, Water and Waste baseline characteristics of the food processing units in unorganized sector

xvi. The units in these sectors vary in scale and size of operations, and also in terms of single products or multiple product manufacturing. Additionally, approximately 14% of the units covered are seasonal and do not operate across the year. 90% of these units in unorganized sector do not possess the following:

- Maintenance of records of energy utilization or previous months electricity bills
- Do not have water meter installed to measure or record consumption of municipal water
- Do not record consumption of ground water
- Do not segregate, store or record the weight of various kinds of waste generation

xvii. In light of the above limitation, a baseline environmental profile for energy utilization, waste generation and water utilization cannot be developed as part of EIA. However it is recommended that in the design phase of IFPVAP program to commence a detailed baseline assessment of Water, Energy and Waste foot print of such units and map this to production of final products as well as utilization of raw material.

xviii. Such an assessment needs to be conducted prior to establishing the KPI's for the program, and the baseline data needs to be periodically assessed to measure progress and improvements in terms of reduction of resource utilization and waste generation.

Environmental Management Framework

xix. The need for environmental management framework is majorly driven by the objective of IFPVAP, which aims to develop and enhance the performance of unorganized food processing industries in India. Various sub-components, when implemented, also require that no environmental risk is left without mitigation. Implementation of the EMF will also support and assist in complying with applicable (both national and state) laws and regulations and also with the relevant Bank's operational policies on environment issues.

xx. Development of the EMF therefore is intended to:

- Enhance positive and sustainable environmental outcomes associated with the project implementation
- Support the integration of environmental aspects into the decision making process in the planning and implementation process at the individual package level
- Minimize environmental degradation as a result of either individual sub-projects or their cumulative effects

xxi. The EMF will be integrated into the preparation and implementation stages of the various project components. It is an essential ingredient aligned with the project/sub-project activities and is to be followed through the entire project cycle from planning, including site identification; design; implementation and operation/ maintenance to attain the above outlined purpose and objectives.

xxii. The application and implementation of the Environment Management Framework will also support the achievement of compliance with applicable laws and regulations as well as with the requirements of relevant Bank policies on environment aspects.

xxiii. In order to facilitate the implementation of Environment Management Principles, sector specific Environmental Action plans have been developed. These are provided in Appendix A1 to A4 in Volume 2: Annexures. These action plans include the following aspects:

- Project appraisal and screening checklist – this checklist is required to be filled by the project beneficiary when applying for assistance under IFPVAP. This checklist serves two main purpose, a) to capture the baseline situation of the beneficiary unit, b) to assess the level of compliance and conditions which are specifically required to be met by the project beneficiary in due course of time.
- The Project appraisal and screening checklist is also required to be disseminated to the project beneficiary as a guiding document for them to address the Environmental Management requirements

- Best practice guidelines – this checklist needs to be shared with the project beneficiary for them to integrate in their operation
- Auditor's checklist - this is a guiding checklist to facilitate periodic monitoring and review of beneficiary's progress in terms of environmental compliance.

xxiv. Going forward during implementation phase, in case any new food processing sector or process is included under IFPVAP (which is not covered here), similar checklist needs to be developed by State Environmental Cell.

xxv. The project proposes to develop newer facilities like warehouse, storage area, common facilities and any other similar infrastructure requirements as per the requirement of the project. The envisaged impact associated with construction of new facilities are discussed in the following section. Proposed mitigation measures are suggested for the foreseen impacts. In case of development of newer facilities, project site specific Environmental Management Plan will need to be developed, however, at IFPVAP program level EMF for construction activities is presented.

xxvi. The EMF is further supported by describing an implementation arrangement which is based in the envisaged structure for project implementation across different states, along with identification of capacity enhancement and monitoring and supervision.

xxvii. The budget for EMF cannot be precisely determined at this point of time. However, key activities which are required to fulfill the EMF implementation have been highlighted.

Recommendations for list of activities to strengthen the EMF

xxviii. Recommended Action for NPMU/ MoFPI to undertake a dedicated baseline assessment for water, energy, and waste generation characteristics in each of the participating states

- At the onset of the program, a dedicated baseline assessment of water, energy, and waste generation characteristics (both type and quantum of usage or generation) of the shortlisted units with regards to consumption of raw materials and production of final products, needs to be conducted.
- This action is recommended to be undertaken during the implementation of subcomponent 4 – "Diagnostic studies" under component 1 - Enabling the business environment for the food processing industry."
- The study should be undertaken by firm hired by MoFPI at the central level.
- It is recommended that the study should be overseen by the Environmental Safeguard specialist of National Project Management Unit at MoFPI
- The results obtained from the baseline study should be used as a benchmark for future assessment and to highlight progress in terms of energy consumption reduction or waste generation reduction.
- The assessment should measure, highlight and promote progress in terms of reduction in consumption of natural resources or reduction in generation of waste.

xxix. Recommended action for State PIUs (which will be established in each State Nodal agencies) to facilitate appropriate waste management strategy development for their respective states:

- State-level diagnostic studies (Component 1) will inform the development of State Strategic Upgradation Plans (SSUPs) laying out focus sub-sectors within food processing, and focus locations, based on concentrations of existing firms and an assessment of market opportunities.
- Based on the outcome of diagnostic studies and baseline energy and waste generation data, the State Nodal Agencies need to undertake a feasibility study of the following

measures to finalize the most effective mechanism for waste handling and disposal in project districts:

- Should a common waste storage facility be developed and managed by district level coordinators, or
- Should a dedicated mobile waste collection van be deployed to collect and dispose waste to local authorize vendors
- The result of the above studies will guide the development of waste management strategy for each district.

- Additionally, The State PIU's should develop and maintain a list of authorized waste disposal vendors active in each district shortlisted for project implementation
- The State PIU's need to promote a standard rate card for collection and disposal of different waste streams.
- These rate cards will act as a source of information for the TSP's at district level, to guide and handhold the MSEs or cluster of MSEs.

xxx. State nodal agency needs to explore the feasibility and establish a mechanism (in liaison with the Department of Industrial Policy and Promotion) for assisting the beneficiary with the FSSAI registration process through Single Window Clearance System. The existing infrastructure of various department such as NRLM, KVIC, ATMA etc., can be explored to help the beneficiary fill in the digital form as per the requirement at their office premises.

xxxi. The Safeguard specialists at NPMU should undertake development of an online reporting system and/or an app-based compliance system to monitor the progress of beneficiary supported by the project. The information on the system/app can be populated by the participating beneficiaries and verified by the implementation agency. The database access can also be shared between different regulatory agencies.

xxxii. The State Nodal Agencies/ State Project Implementation Unit should liaison with FSSAI for creating food safety guidelines specific to the micro enterprises so that food safety and hygiene parameters are met without burdening the beneficiaries.

xxxiii. Due to limited NABL accredited laboratories and large distances of these laboratories from the location of the beneficiary units, it is recommended that the State Nodal Agencies/ State Project Implementation Unit can undertake a feasibility study for arranging special transportation vehicles which can collect food sample and safely deliver it to accredited laboratories for testing. The State Nodal Agencies/ State Project Implementation Unit can liaison with FSSAI for such a solution and also utilize their existing infrastructure in place.

xxxiv. The funds for the above mentioned activities needs to be allocated through EMF Budget.

Recommended Budget for EMF implementation

- The budget for EMF implementation should be framed by respective state by assessing the requirement of infrastructural development, number of Environmental Management Cells to be created, requirement of staffs in Environmental Management Cells and other developed facilities (like laboratory technicians, ETP operators) etc. once the overall need is finalized.

- The exact quantum of Budget to be utilized for EMF cannot be estimated. This heavily depends on the actual project implementation structure as proposed by SPMU and agreed by NPMU for catering to 143 districts across 4 states.

- However, it is recommended that the EMF budget should be allocated to the tune of 1% of the entire project cost.

1. Introduction

1.1. Project Background

i. India has immense growth potential as a food supplier as well as a consumer nation. Food processing sector has been identified as a key sector under Make in India initiative of GoI. Success of this sector is also closely linked with multiple other national level plans and ambitions like doubling income of farmers.

ii. The Indian food processing industry accounts for approximately 14 percent of manufacturing GDP and approximately 13 percent of manufacturing employment, with a total of 6.87 million workers (2015-2016 census) employed in the sector. It is one of the largest industries in India and is ranked fifth in terms of production, consumption, and exports.

iii. These units face numerous challenges including: (a) lack of productivity and innovation due to limited skills and access to modern technology and machinery for production and packaging; (b) deficient quality and food safety control systems, including lack of basic awareness on good hygienic practices (GHP) and good manufacturing practices (GMP); (c) inadequacy of information and difficulties in promoting typical products; unorganized food processing enterprises are unable to access food growth markets because of low levels of formal relationship with large firms impacting their ability to leverage up stream markets and also have stable and secure business contracts; and (d) limited access to credit from formal financial institutions to expand production capacities. (Source: Project document IFPVAP, World Bank)

Definition of Unorganized Enterprises- *different arms of Government use different definitions:*

As per Factories Act, 1948, unregistered enterprises are those which employ less than 10 or 20 workers depending on whether power is being used for manufacturing or not respectively. In certain States, Maharashtra and Rajasthan, Factories Act has been amended recently and increased the respective numbers to 20 or 40 workers.

Directorate General of Employment and Training (DGET) defines all establishments employing ten workers and above as "organized".

National Commission of Unorganized Enterprises recommended criteria in terms of number of workers in addition to ownership criteria is appropriate and defined as "The unorganized sector consists of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than 10 total workers.

Micro enterprises under this programme have been defined as units with investment in plant and machinery of less than INR 25 Lakhs, as defined under the MSME Act, and as amended from time to time.

1.2. Project Description of IFPVAP – "Gram Samridhi Yojana"

iv. Ministry of Food Processing Industry has agreed on World Bank assisted "India Food Processing and Value Addition Program (IFPVAP)" for promotion of unorganized food processing sector.

v. The programme aims to modernize and enhance the competitiveness of the micro enterprises through their formalization. The Program is expected to benefit approximately 70,000 micro enterprises with outcomes aimed at increased access to credit, better integration with organized Markets, Transition of 70,000 enterprises into formal frameworks and increased access to common services like food testing and incubation services.

vi. This sector faces a number of challenges including inability of the entrepreneurs to access credit, high cost of institutional credit, lack of access to modern technology and inability to integrate with the food supply chain or compliance with the health and safety regime of Food Safety and Standards Authority of India (FSSAI). GSY seeks to address these problems of the micro food processing enterprises through a comprehensive package of interventions for creating a supportive business environment, strengthening capacities of support service providers and improving access to support services by the entrepreneurs.

vii. IFPVAP program once launched will cover all States and Union Territories but will be initially rolled out in states which have taken preparatory steps viz. Andhra Pradesh, Maharashtra, Punjab and Uttar Pradesh.

1.3. Scope and Objective of Environmental Assessment (EA)

viii. Environmental Assessment is generally undertaken in order to predict environmental impacts of any development activity and to provide an opportunity to mitigate against negative impacts and enhance positive impacts.

ix. This study Environmental Assessment (EA) and the resultant Environmental Management Framework (EMF)) is expected to guide the IFPVAP project interventions, to ensure that the project activities do not cause any harm, are in compliance with the applicable national and local regulations, as well as World Bank safeguards policies. The will also ensure that potential adverse impacts are adequately mitigated and potential benefits of the project are enhanced to improve effectiveness and sustainability of the project. Relevant portions of the EMF will be suitably integrated with project contract documents to facilitate smooth implementation during the rehabilitation and operation phases.

x. Scope of work for the environmental assessment and for the development of environment management frameworks involves:

- Identification of key environmental issues and challenges in relation to proposed project activities at the national level and state level and sample districts of Andhra Pradesh, Maharashtra, Punjab and Uttar Pradesh.
- As part of EA, all four states should be covered with two districts in each, one of which should be aspirational district.

Table 1: Key tasks associated with the Environmental Assessment

S No	Key tasks associated with Environmental Assessment
1	Review of the legal and policy environment
2	Understand the trigger for World Bank Environmental Safeguard Policies
3	Conduct Stakeholder consultation and field visits
4	Establish the environmental baseline of key issues including food safety, health, hygiene and effectiveness of regulatory mechanisms
5	Identification of environmental impacts and risks
6	Mapping of commodities for standards to identify those lacking a guidance

7	Development of EMF and list of other recommended studies to strengthen EMF

1.4. Approach and Methodology for EA

xi. Desk Review: The project started with a desk review of the general landscape of food processing industry in India as well as specific to the four target states. It also included a review of a wide range of national and state-specific Laws, Acts and Policies applicable to this project and World Bank safeguard policies.

xii. Finalizing the categories of food products to be involved in the review: on the basis of secondary research it was observed that the major food categories that can have a large contribution from micro enterprises and unregistered enterprises are:

- Dairy product processing,
- Fruits & vegetable processing,
- Grains and oilseed processing including spice manufacturing,
- Packaged food processing (Bakery, Snacks and Savories)
- Meat and poultry processing
- Beverages and packaged drinking water

xiii. Consultation with state nodal bodies to finalize the target districts for review: in order to shortlist the target districts for field survey, consultations were held with state nodal representatives on following aspects:

- Understanding the prominence of various production clusters and processing clusters based on above five categories in various districts in each state
- Consultation to understand the state's plan for development activities under IFPVAP
- On the basis of above consultation, the following districts were identified for field study

Table 2: The final districts in the select states for the environmental assessment

State	Districts	Aspirational District
Andhra Pradesh	Prakasam	Vizianagaram
Maharashtra	Nashik	Washim
Punjab	Sangrur	Moga
Uttar Pradesh	Aligarh	Fatehpur

xiv. Post finalization of districts, field survey were undertaken to review the operational practices, key environmental, health, safety and hygiene concerns for unregistered food processing units. The survey aimed at targeting at least 25 units for each district, spread across different food segments as described above.

xv. The data collected from secondary sources was complemented by information gathered from field level consultations and survey of food processing units. This was conducted by a multidisciplinary team comprising of experienced sustainability professionals guided by environmental and food processing industry experts. Semi structured interviews were conducted with various institutions such as DIC, FSSAI, Dept. of Agriculture, Nabard, SPCB Etc.

xvi. Post consultation and survey, an analysis of the information obtained has been undertaken, which has led to development of this Environmental Assessment and Environmental Management Framework report.

xvii. *Note:* During the field survey, we have observed that meat processing, poultry product processing in value added products and beverage and packaged drinking water segments are not present in units defined by Micro enterprise. They are mostly present in small to medium scale industries due to the nature of investment and workforce required in such plant's operations. Hence, going forward these two value chain are not elaborated as part of environmental baseline. The environmental baseline is limited to 4 sectors i.e. dairy product processing, fruits and vegetable processing, grains and oilseeds and packaged foods.

1.5. Structure of the report

xviii. Structure of this report is as follows:

- Executive summary
- Chapter 1 provides an overview of the project and discussed the scope of work and methodology that was adopted for conducting the study.
- Chapter 2 provides an overview of the legal and policy framework in which the project would operate. This includes legislations of the Government of India and Government of Andhra Pradesh, Maharashtra, Punjab and Uttar Pradesh as well as World Bank safeguard policies
- Chapter 3 provides an overview and Environmental profile of key food processing sectors on basis of secondary information followed by inputs from field visits in shortlisted districts
- Chapter 4 provides the Environment Management Framework and highlights specific plans such as Measures to enhance the positive environmental outcomes, System for periodic third party inspection and certification of participating unit, Pest Management Plan, Employee Health, Hygiene and safety management Plan, Clauses to be included in the Bid document for financial institutions.
- Chapter 5 describes the monitoring and supervision requirements
- Chapter 6 provides details around Institutional Arrangements and capacity development plan

2. Legal and policy framework

2.1. Introduction

i. The proposed project will be undertaken in the backdrop of the legislative and regulatory framework of the Government of India, corresponding rules and regulations of Andhra Pradesh, Maharashtra, Punjab and Uttar Pradesh and the safeguard policies of the World Bank. It is therefore imperative to identify and adhere to such legal and regulatory provisions in the course of project pre-planning, planning, implementation and monitoring.

ii. This chapter describes the key legislations and policies which would have a bearing on the design and implementation of India Food Processing and Value Addition Project. It is based on a review and analysis of existing legal and policy frameworks as applicable on the operations of food processing sectors in India.

2.2. Relevant Rule and Regulation under GOI

iii. A summary of national and state level legislations and policies relevant to the project are presented in Tables below:

Table 3 - Relevant Rules and Regulations under GoI

<table>
<tr><th>S No</th><th>Name of relevant Act/Policies/Rules</th><th>Salient Features</th><th>Relevance to Project Interventions</th></tr>
<tr><td>1</td><td>Environment Protection Act 1986</td><td>EPA (1986) is an umbrella Act that provides for introduction of various regulations aimed at environmental conservation and protection.</td><td rowspan="4">The project components will lead to development of common infrastructure and facilities which may impact surrounding land, air and water and create environmental pollution and hence may require CTE and CTO from the pollution control board.

Applicability of requirement of Environmental Clearance under purview of EIA notification, 2006 and its subsequent amendment for development of individual components of project to be reviewed prior to commencement of any infrastructural development work.</td></tr>
<tr><td>2</td><td>Water conservation and preservation Act 1974, and subsequent amendments</td><td>This Act empowers central and state government to take requisite measures to prevent and control water pollution.</td></tr>
<tr><td>3</td><td>Air (Prevention and Control of Pollution) Act 1981</td><td>Similar to Water Act, the Air Act vests regulatory authority on the State Pollution Control Boards and empowers them to enforce air quality standards to prevent air pollution in the country.</td></tr>
<tr><td>4</td><td>EIA Notification 2006 (Principal rules)</td><td>These regulations impose restrictions and prohibitions on new projects or activities, or on the expansion or modernization of existing projects or Activities based on their potential environmental impacts. It makes mandatory for selected projects (as per schedule of the regulations) to obtain environmental clearance.</td></tr>
<tr><td>5</td><td>The National Green Tribunal Act, 2010</td><td>This Act was enacted to establish National Green tribunal for fast and effective disposal of case related to environmental protection, conservation of forest and natural resources.</td><td>Development Activities may lead to environmental impacts which if challenged in the court needs to be resolved through the tribunal. The tribunal shall hear the disputes arising from the impacts on environment and shall order relief and compensation to victims and shall order for restitution of damaged property and environment.</td></tr>
</table>

S No	Name of relevant Act/Policies/Rules	Salient Features	Relevance to Project Interventions
6	Energy conservation Act	The Act establishes Bureau of Energy	One of the sub Activity of the project is to
	2001	Efficiency to promote efficient use of energy and its conservation and for matter related to it.	promote R&D Activities and promote use of appropriate and affordable technologies. Hence there may be investment in energy efficient equipment, energy conservation measures and matters related to energy consumption and conservation.
7	Forest (Conservation) Act, 1980	This Act regulates the use of forest land for non-forestry purposes with an aim to protect forest and natural resources.	Development Activities to strengthen FPOs and construct infrastructure may lead to diversion of forest land for non-forestry purposes.
8	Biological Diversity Act 2002,	The Act regulates biological diversity and advocates sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected.	The Act can act as guideline for sustainably implementing project sub-components and preventing the impact on environmentally sensitive area.
9	Bio-Medical Waste Management Rules, 2016	These rule aims to improve the collection, segregation, processing, treatment and disposal of these bio-medical wastes in an environmentally sound management thereby, reducing the biomedical waste generation and its impact on the environment.	
10	Solid Waste Management Rules, 2016	The Act aims to regulate collection, storage and disposal of solid waste (excluding, industrial waste, hazardous waste, hazardous chemicals, bio medical wastes, e-waste, lead acid batteries and radio-Active waste, that are covered under separate rules). The Act applies to every domestic, institutional, commercial and any other non-residential solid waste generator situated in the areas except industrial waste, hazardous waste, hazardous chemicals, bio medical wastes, e-waste, lead acid batteries and radio-Active waste, that are covered under separate rules.	Project interventions with respect to development of common infrastructure and facilities like sorting, grading, packaging, testing and storing, industrial operation, supporting R&D activities to evolve existing technologies and facilitation of branding and advertisement may lead to generation of different types of waste.
11	Construction and Demolition Waste Management Rules, 2016	These rules aims to improve the collection, segregation, recycling, treatment and disposal of solid waste in an environmentally sound manner. The Act is applicable to every waste resulting from construction, re-modelling, repair and demolition of any civil structure of individual or organization or authority who generates construction and demolition waste such as building materials, debris, rubble.	

S No	Name of relevant Act/Policies/Rules	Salient Features	Relevance to Project Interventions
12	Plastic Waste Management (Amendment) Rules, 2018	The Act gives thrust on plastic waste minimization, source segregation, recycling, involving waste pickers, recyclers and waste processors in collection of plastic waste fraction either from households or any other source of its generation.	
13	Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.	These rules shall apply to the management of hazardous and other wastes not specified separately in other rules.	
14	The Indian Boilers Act 1923	This act regulates manufacture, registration and use of steam boilers. Central Government has been empowered to constitute the Central Boilers Board. In many states, the factories inspectorate and Boilers Inspectorate are under one authority i.e. Chief Inspector of Factories and Boilers.	The Act can act as guideline for use and registration of steam boilers so that the requisite conditions can be laid down to avoid any accidents or injuries.

2.3. Key regulations specific to food safety and standards

Table 4 - Key Regulations specific to food safety and standards

S No	Name of relevant Act/Policies/Rules	Salient Features
1	Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations 2011 and subsequent amendments	***Objective:*** The regulations are applicable on "Petty Food Manufacturer" defined as any food manufacturer, who (a) manufactures or sells any article of food himself, or (b) such other food businesses including small scale or cottage or such other industries relating to food business or tiny food businesses with an annual turnover not exceeding INR 12 lakhs and/or whose production capacity of food (other than milk and milk products and meat and meat products) does not exceed 100 kg/liter per day. For dairy petty manufacturers are those whose procurement or handling and collection of milk is up to 500 liter of milk per day and for meat & poultry are those whose slaughtering capacity is 2 large animals or 10 small animals or 50 poultry birds per day or less ***Governing requirements:*** ● Registration of Petty Food Business Every petty Food Business Operator shall register themselves with the Registering Authority ● The petty food manufacturer shall follow the basic hygiene and safety requirements provided in Part I of Schedule 4 of these Regulations and provide a self-attested declaration of adherence to these requirements with the application ***Exception:*** A producer of milk who is a registered member of a dairy Cooperative Society registered under Cooperative Societies Act and supplies or sells the entire milk to the Society shall be exempted from this provision for registration.

2	Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 and Subsequent Amendments	***Objective:*** The key objective of this regulation is to provide vertical standards for the various food products and prescribe the limits of the various food additives used across different food groups. It covers the following food categories: 1. Grains and Oilseed 2. Meat and Sea food 3. Fruits & Vegetable 4. Dairy

S No	Name of relevant Act/Policies/Rules	Salient Features
		5. Salt, spices, condiments and related products 6. Sweetening agents including honey 7. Beverages (Other than dairy and fruits and vegetables based) 8. Other food product and ingredients 9. Proprietary food 10. Irradiation of food
3	Food Safety and Standards (Packaging and Labelling) Regulation, 2011 and subsequent amendments	***Objective:*** The Food Safety and Standards Authority of India has decided to bifurcate the existing Food Safety and Standards (Packaging and Labelling) Regulations, 2011 into the following: · Food Safety and Standards (Packaging) Regulations, 2018 · Food Safety and Standards (Labelling and Display) Regulations, 2018 The Packaging Regulations, 2018 have been enforced since 24th December, 2018 replacing the provisions for packaging under the existing 2011 Regulations. Food Business Operators have been directed to comply with the provisions of these Regulations within 1st July, 2019. The Labelling and Display Regulations, 2018 have not yet been notified and thus the 2011 Regulations are still in force and has been amended vide the Food Safety and Standards (Packaging and Labelling) First Amendment Regulations, 2018, effective 24th December, 2018.
4	Food Safety and Standards (Contaminants, Toxins and Residues) Regulation, 2011 and subsequent amendments	***Objective:*** The regulation applies to all food business operators. These Regulations govern the permissible limits for various Contaminants, Toxins and Residues to be adhered to during manufacture of various articles of food.
5	Food Safety and Standards (Prohibition and Restriction on Sales) Regulation, 2011	***Objective:*** The regulation applies to all food business operators. It establishes prohibitions and restrictions on the sales of various food products, ingredients and their admixtures.

S No	Name of relevant Act/Policies/Rules	Salient Features
6	Food Safety and Standards (Food Recall Procedure) Regulation, 2017	***Objective:*** The key objective of this regulation is to ensure the removal of food under recall from all stages of the food chain and ensure follow up action if required. ● Under these regulations, it is required that food business operator shall have procedures and systems in place to identify the food businesses to whom they have supplied their food. ● The food business operator shall maintain the food distribution records which include the names and addresses of suppliers and customers, nature of food, date of purchase, date of delivery, lot number, batch code, pack size, brand name, date of manufacture, date of expiry and best before date, and shall maintain such records for a period of one year from best before date or the expiry date, as applicable. ● All food business operators engaged in the manufacture or importation or wholesale supply of food regulated under the Act must have an up-to-date recall plan.
7	Food Safety and Standards (Fortification of Foods) Regulations, 2018	***Key features of Food Fortification Regulations are as follows:*** It prescribes the standards of addition of micronutrients for the purpose of food fortification. The manufacturers of the fortified food are required to provide a quality assurance undertaking. Packaging and labelling of the fortified food must state the food fortification added, logo and the tagline "Sampoorna Poshan Swasth Jeevan". Also, it should be in compliance to the Food Safety and Standards (Packaging and Labelling) Regulations, 2011 or amendments thereof.
8	Food Safety and Standards (Advertising and Claims) Regulations, 2018.	***Objective:*** These regulations are aimed at establishing fairness in claims and advertisements of food products and make food businesses accountable for such claims /advertisements so as to protect consumer interests. As per these regulations, food business cannot use the words/phrases such as natural, fresh, original, traditional, authentic, genuine, real etc. on the food labels except under specific conditions detailed therein. Such restrictions are primarily aimed at restricting an open-ended use of these words/phrases by food businesses on frivolous grounds.
9	Food Safety and Standards (Organic Foods) Regulations, 2017	***Objective:*** The regulation is applicable on any person responsible for manufacture, packaging or selling of organic food items, except those dealing with organic food which is marketed through direct sales to the end consumer by the small original producer or producer Organization is exempted from the provisions of the certification. Small original producer or producer organization is the one whose annual turnover does not exceed INR 12 Lakhs per annum. The regulation prescribes compliance with applicable provisions of two systems of certification i.e. Participatory Guarantee System (PGS) implemented by the Ministry of Agriculture and Farmers Welfare and National Program for Organic Production (NPOP) implemented by the Ministry of Commerce and Industry. It also provides direction on labelling and traceability.

2.4. Food certifications mark applicable in India

Table 5 -Food Certification marks of India

S No	Name of relevant Act/Policies/Rules	Salient Features
1	AGMARK	AGMARK is a certification mark employed on agricultural products in India, assuring that they conform to a set of standards approved by the Directorate of Marketing and Inspection an attached Office of the Department of Agriculture, Cooperation and Farmers Welfare under Ministry of Agriculture & Farmers Welfare an agency of the Government of India. The requirements of AGMARK certification also cover processed and semi-processed agricultural products. Till date, grade standards for 222 agricultural commodities have been notified. The commodities certified under Agmark for domestic trade are spices, ghee, butter, mustard oil, wheat atta, Besan, honey, etc. Compulsory grade designation has not been prescribed for any commodity, however, certification of blended edible vegetable oils and fat spread is compulsory under Agmark as per the provision in Food Safety and Standards (Prohibition and Restriction on Sales) Regulations, 2011.
2	Vegetarian and nonvegetarian marks	Packaged food products sold in India are required to be labelled with a mandatory mark in order to be distinguished between lacto-vegetarian and non-lacto-vegetarian. The symbol is in effect following the Food Safety and Standards (Packaging and Labelling) Act of 2006, and got a mandatory status after the framing of the respective regulations (Food Safety and Standards [Packaging and Labelling] Regulation) in 2011. According to the regulation, vegetarian food should be identified by a green symbol and non-vegetarian food with a brown symbol.

2.5. Relevant state policies and regulations

Table 6 - Relevant State Policies and Regulations applicable to the food processing industry

<table>
<tr><th>S No</th><th>Name of relevant Act/Policies/Rules</th><th>Salient Features</th><th>Relevance to Project Interventions</th></tr>
<tr><td>1</td><td>Maharashtra Plastic and Thermocol Products notification, 2018</td><td>PET or PETE bottle manufacturers, producers, sellers and traders under Extended Producer and seller/trader responsibility will develop “Buy back repository mechanism with a predefined buyback price printed specially on such bottle and also set up collection centers, reverse vending machines, crushing machines with linkages established with recycling unit</td><td rowspan="3">The project will not directly lead to consumption of plastics and, thermocol and other non-biodegradable wastes but because of augmentation of food producers as a result of this program, there will be increase in use of plastics and other non-biodegradable products for packaging and storing of food products.</td></tr>
<tr><td>2</td><td>Maharashtra nonbiodegradable garbage (Control) act 2006</td><td>The act aims to regulate the use nonbiodegradable material and to prevent throwing or depositing of nonbiodegradable garbage in public drains, roads, wetland, wasteland, water bodies, places open to public view</td></tr>
<tr><td>3</td><td>Maharashtra Plastic carry bag rules 2006</td><td>The rule prohibits use of recycled bags made of recycled plastics for storing, carrying, dispensing or packaging of food stuff</td></tr>
</table>

2.6. Other regulations applicable to food processing industries

Table 7 - Other regulations applicable to the food processing industry

S No	Name of relevant Act/Policies/Rules	Salient Features	Relevance to Project Interventions
1	Insecticide Act 1968 & Rules 1971 Central Insecticides Board- Central Government	The act regulates the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, and for matters connected therewith. As per the rule it mandatory to obtain license from the board for person involved in stock or exhibit for sale or distribute insecticides. Further, it lays down procedures for destruction of pesticides after their date of expiry.	Project will not involve activities like procurement, stocking and sale of insecticides as all the crop productivity enhancement is planned through non-chemical methods. But In case of emergency of outbreak of any disease this might be applicable.
2	Prevention of Cruelty to Animals (Slaughter House) Rules, 2001 Ministry of social justice and Empowerment	To prevent the infliction of unnecessary pain or suffering on animals and for that purpose to amend the law relating to the prevention of cruelty to animals.	As per the project subcomponents, provision of slaughter house is one of the project interventions. Hence these rules should be adopted.

2.7. Key State level policies relevant to food processing sector

Table 8: State Level Regulation and Legislation Relevant to the Project

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
	ndhra Pradesh				

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
1	**AP Food Processing Policy, 2015 -2020**	Andhra Pradesh Food Processing Society (APFPS)	a) Attract new investments worth INR 5,000 Crores in the sector by 2020 b) Create 50,000 additional employment in the state by 2020 c) Develop commoditybased clusters to promote food processing industries d) Identify and bridge existing infrastructure gaps affecting the food processing industry e) Promote innovation, research & development in the industry and ensure continuous technology up gradation f) Undertake capacity building and enhance competitiveness of food processing industry in both domestic and international markets	• The government shall introduce a set of initiatives that will ease the compliance procedures for new and existing food processing companies • GoAP will strive to setup Integrated food parks across all districts of Andhra Pradesh	• Since 2014, the scheme has benefited 331 units • The policy has generated an employment opportunity for 74,289 persons • 5,04740.83 crore of investment has been initiated under the scheme

2	**Industrial Development Policy 2015-2020**	State Investment Promotion Board (SIPB)	The key objective of this policy is to provide fiscal incentives to the categories of Micro/Small Enterprises, Medium Enterprises and Large Industries, Schedule Caste/ Schedule Tribe Entrepreneurs and Women Entrepreneurs	The policy is not directly linked with Food processing industries but it focusses on promoting any manufacturing industry in general. Salient features are noted below: • GoAP shall create an e-platform single desk clearance, for facilitating all necessary clearances for starting and operating an industry within 21 working days. • Spot approvals shall be given in case of clearances / approvals which require only a scrutiny of basic documents. They include Registration under Professional Tax, Registration of Shops and Establishments, Registration of establishments deploying contractual workmen / interstate migrant workmen among others • State will provide capacity building courses to reduce the gap in the skill set required by the industry • Training institutions at divisional level shall be setup through PPP approach to facilitate industry wide initiatives aimed at enhancing the employability of unskilled/semi-skilled labour	• Developed over 300 industrial estates • Created over 1 million jobs • Mobilised investments worth over INR 1 lakh Crores • Promoted 32 SEZ's

				• Government to provide world	

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
				class infrastructure, state of art R&D centers and quality human capital to attract FDI inflows into the state	
Maharashtra					
3	**Maharashtra Industrial Policy, 2013-2018**	Maharashtra Industrial Development Corporation (MIDC)	The key objectives are: • Development of MSMEs and Strengthening industrial infrastructure • Provide incentive packages for Ultra Mega and Mega Industrial investment	• Units under Food Processing Sector will be granted additional 10% incentives and additional one year towards eligibility period • Promote and support grape production and infrastructure for wine parks across the state • Generating employment for million people persons • Attracting investment worth ₹ 5 lakh crore	• During 2014-18, 119 private IT parks with an investment of INR 192.6 billion and employment of 5.5 lakh person have been generated under this scheme
Uttar Pradesh					

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
4	**The U.P Food Processing Industry Policy, 2017**	Directorate of Horticulture and Food Processing - Government of Uttar Pradesh	The key objective of this policy is to promote the development of food processing industries which will generate new employment opportunities and also increase the skill level	• Ensuring fair and remunerative price of the produce to the growers • Development of Food Processing park, mega food park and cold chain facility • Easy availability of processed food products to consumers at competitive prices	• By 2024, food processing sector is expected to employ 9 million people in India
			of the manpower	• Increase the skill level of the manpower in this sector	

5	**Industrial Investment and Employment Promotion Policy of Uttar Pradesh 2017**	Government of Uttar Pradesh 2017	The key objective of this policy is to skill the workforce of the state to ensure employability and empowerment. The policy further facilitates the provision of pro-active support to micro, small, medium enterprises	The GoUP intends to provide various facilities and incentives to promote the Agro and Food Processing Sector under the "Mukhya Mantri Khadya Prasansakaran Mission Yojana". Some of the facilities are: • Interest free loan to small scale food processing units for their establishment and expansion • Development of cold chain, value addition and processing infrastructure • Establishment of primary processing sector and collection centers in rural areas • The uninterrupted power supply and reimbursement of VAT/ CST/ GST to food processing units • Creation of infrastructure facilities for degree/ diploma/ certificates courses, food processing skill development programs, etc. • Market development and brand promotion as well as the encouragement of standardization.	• 33 industrial estates were developed by the government for setting up of the industrial units mainly by small entrepreneurs • INR 6.98 crore has been incurred towards improvement /maintenance of facilities such as roads, streets, water supply and drainage system in exiting industrial estates located in different cities/towns of the state from 2007-08 to Dec. 2010

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
				• Establishment of mega food parks in state as well as establish Food processing park in all the regions of the state with packaging, exports and research facilities. • Exemption from Mandi fee for all new food processing units on purchase of raw material for 5 years	
6	**UP MSME Export Promotion Policy**	Government of Uttar Pradesh 2017	• Annual growth rate of MSME to be increase by 15% • Annual employment to increase by 15% • Facilitate land and technological requirements for new enterprises • Provided technical infrastructure for quality assurance for MSME products	The policy is applicable for all the sectors covered under MSME	• Since 2007-08 till December 2010, a total of 2751 units of small entrepreneurs /exporters /manufacturers have been assisted with INR 2465 lakhs under this scheme
Punjab					

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
7	**Industrial and Business Development Policy 2017, Amended as on**	Department of Industries & Commerce, Government of Punjab	• Accelerate growth of MSMEs • Facilitate availability of skilled manpower	• 100% reimbursement of market fee, rural development fee and other state taxes and fees on raw material for food processing industries up to 10 years	• It envisages establishment of 10 technology centers, 10 common facility centers and 10 clusters for development in first phase • 14 new industrial parks have been
	30.07.2018		to the Industry • Improve the ease of doing business in the State	• Schemes for fiscal Incentives to MSMEs	developed under the scheme
	Central government				

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
8	**Draft National Food Processing Policy, 2017**	Ministry of Food Processing Industries along with the State 2017	Aims for overall growth and development of food processing industry	• Labour & Employment Department, Government of State should make necessary amendments and declare food processing industry as essential service under State Essential Services Maintenance Act • Under all relevant labour laws, food industry should be treated as seasonal industry and benefits available to a seasonal industry suggested to be extended to it • Incentivize industries working on traditional Indian foods and therapeutic foods to help them standardize ingredients and preparation procedure • Assistance will be provided for industry recognized skill certifications from recognized institutions • Assistance will be provided for meeting the expenditure of obtaining patent and other IPR subsidy including the cost consultant fee, government fee etc.	This policy is currently under draft stage

				• Provide funds to promote creation and upgradation of new product development including packaging • Assistance to be provided for research work approved by government undertaken by reputed research institutions • Capital subsidy to be provided for technology upgradation/modernisation of existing food processing units • Special assistance to be provided for internationally accepted quality or environmental certification, viz. ISO 14001, ISO 22000, HACCP • To promote the Made in India brand	
9.	**Scheme of Fund for Regeneration of Traditional Industries (SFURTI)**	Ministry of Micro Small and Medium Enterprises (MSME)	• The objectives of the scheme is to organize the traditional industries and artisans into clusters to make them competitive and provide support for their long term sustainability	• The policy focusses on promoting any traditional industries including Agro Based & Food Processing industries • To enhance marketability of products of such clusters • Equip traditional artisans of the associated clusters with the improved skills, to make	• Target to develop 71 clusters with coverage of 44500 artisans (approx.) in the first phase • 71 clusters have been given inprinciple approval by Scheme Steering Committee (SSC) and 32 DPRs have been given final approval • As of now, 30438 artisans have been benefitted

				provision for common facilities and improved tools and	• Future target for setting up of 800

Sr. No	Name of Policy	Responsible institution	Key objective	What does the policy say about Food Processing Industry	Highlights
			• According to the Budget 2019-20, SFRUTI will aim to set up more common facility centers for generating sustained employment opportunities • SFURTI also envisions at setting up of 100 new clusters during 2019-20 to enable 50,000 artisans to join the economic value chain	equipment's for artisans • To strengthen the cluster governance systems with the active participation of the stakeholders • To build up innovated and traditional skills, improved technologies, advanced processes, market intelligence and new models of public-private partnerships, so as to gradually replicate similar models of cluster-based regenerated traditional industries	clusters of Khadi, village industries and Coir and to cover around 4 lakh artisans.

2.8. Key policies and schemes focused on the target enterprises, relevant to project interventions

iv. One of the sub project of the program is to converge existing similar schemes at national and state level so that larger benefit can be derived by the target group. The table below showcases schemes similar to IFPVAP for the target enterprises.

Table 9: Similar Schemes Applicable to Women and other Social Groups

<table>
<tr><th colspan="2">1. The Khadi and Village Industries Commission (KVIC):</th></tr>
<tr><td>Institution, its objective and responsibility</td><td>Linkage and relation to IFPVAP's objective</td></tr>
<tr><td>KVIC is an apex organisation under the Ministry of Micro, Small and Medium Enterprises.
It is responsible the planning, promotion, organisation and implementation of programs for the development of Khadi and other village industries in the rural areas in coordination with other agencies engaged in rural development</td><td>KVIC has three main objectives which guide its functioning:
• The Social Objective - Providing employment in rural areas
• The Economic Objective - Providing saleable articles
• The Wider Objective - Creating self-reliance amongst people and building up a strong rural community spirit

Its functions also comprise of:
• Building up of a reserve of raw materials and implements for supply to producers
• Creation of common service facilities for processing of raw materials as semifinished goods and provisions of facilities for marketing of KVI products
• Training of artisans engaged in these industries and encouragement of co-operative efforts amongst them.
• Providing financial assistance to institutions and individuals for development and operation of Khadi and village industries</td></tr>
<tr><td colspan="2">Implementation of programs and schemes:
The KVIC has broadly re-grouped various village Industries under seven heads for the purpose of implementation of its programs. One of the heads is Agro Based & Food Processing Industry (ABFPI) which consists of: □ Pulses & Cereals Processing Industry
• Gur & Khandsari Industry
• Palmgur Industry
• Fruit & Vegetable Processing Industry
• Village Oil Industry

The process of Implementation of schemes and programs is decided, funded and approved by MSME. KVIC implement its programs either directly - Through its 29 state offices, by directly funding Khadi and Village institutions and co-operatives, or indirectly through 34 Khadi and Village Industries Boards, which are statutory bodies formed by the state governments within India</td></tr>
<tr><td>Key policies and schemes relevant to food processing sector</td><td>Influence on project's activities</td></tr>
</table>

1	Prime Ministers Employment Generation Program (PMEGP)	***Nature of assistance:*** The maximum cost of the project/unit admissible in manufacturing sector is ₹ 25 lakhs. The balance amount of the total project cost will be provided by the banks in the form of term loan and working capital ***Eligibility:*** An individual, above 18 years of age. At least VIII standard pass for
		projects costing above Rs.10 lakh in the manufacturing sector Only new projects are considered for sanction under PMEGP. Self Help Groups (including those belonging to BPL provided that they have not availed benefits under any other Scheme), Institutions registered under Societies Registration Act, 1860; Production Co-operative Societies, and Charitable Trusts are also eligible. ***Financial assistance to women and other social groups:*** Rural beneficiaries receive up to a 25% margin compensation in rural areas and 15% in urban areas for the general category and 35% in rural areas and 25% in urban areas for SCs, STs, OBCs, minorities and women among other special categories Under PMEGP, KVIC has also developed and posted sample project profiles for establishing various food processing units. These can be accessed online at the following URL: https://www.kviconline.gov.in/pmegp/pmegpweb/docs/jsp/newprojectReports.jsp

2.	***National Horticulture Board (NHB)***	
Institution, its objective and responsibility		***Linkage and relation to IFPVAP's objective***
NHB is registered as a Society under the Societies Registration Act 1860, with its headquarters at Gurugram.		The main objectives of the NHB are to improve integrated development of Horticulture industry and to help in coordinating, sustaining the production and processing of fruits and vegetables. Amongst all its activities, its function also comprises of development of integrated, energy efficient cold chain infrastructure for fresh horticulture produce
Key policies and schemes relevant to food processing sector		***Influence on project's activities***
1	Development of Commercial Horticulture through Production and Post-Harvest Management - Integrated Post Harvest Management projects	***Nature of assistance:*** Integrated Post Harvest Management projects relating to Pack House, Ripening Chamber, Reefer Van, Retail Outlets, Pre-cooling unit, Primary processing etc. are assisted under this component. NHB also accepts standalone projects of PHM in component mode. ***Financial assistance to social groups:*** Credit linked back ended subsidy @ 35% of the total project cost limited to Rs 50.75 lakh per project in general area and @ 50 % of project cost limited to Rs. 72.50 lakh per project in NE, Hilly and Scheduled areas

2	Capital Investment Subsidy Scheme for Construction/Expansion/ Modernization of Cold Storages and Storages for Horticulture Products	***Nature of assistance:*** Setting up of cold storage (of capacity above 5000 MT and up to 10000 MT) and their modernization are eligible for assistance under the NHB Scheme of Capital Investment subsidy for construction/ expansion/ modernization of cold storage for Horticulture Products (a sub scheme under MIDH). It is open ended credit linked scheme with scale of assistance @ 40% of capital cost of project limited Rs 30.00 lakhs per project in general area and 50% limited to Rs 37.50 lakhs per project in case of NE, Hilly & Scheduled Areas ***Note:*** due to high investment cost, this scheme does not directly apply to unorganised and micro food processing units, however, it can form a basis for their cluster aggregation and development under IFPVAP
3.	***Development Commissioner - Ministry of Micro, Small and Medium Enterprises (DC-MSME)***	

Institution, its objective and responsibility	***Linkage and relation to IFPVAP's objective***
MSME is the Apex body for the formulation and administration of rules, regulations and laws relating to micro, small and medium enterprises in India.	The primary responsibility of promotion and development of MSMEs is of the State Governments. However, the Government of India, supplements the efforts of the State Governments through various initiatives. The role of the Ministry of MSME and its organizations is to assist the States in their efforts to encourage entrepreneurship, employment and livelihood opportunities and enhance the competitiveness of MSMEs in the changed economic scenario. The schemes/ program undertaken by the Ministry and its organizations seek to facilitate/provide: i) Adequate flow of credit from financial institutions/banks; ii) Support for technology upgradation and modernization; iii) Integrated infrastructural facilities; iv) Modern testing facilities and quality certification; v) Access to modern management practices; vi) Entrepreneurship development and skill upgradation through appropriate training facilities; vii) Support for product development, design intervention and packaging; viii) Welfare of artisans and workers; ix) Assistance for better access to domestic and export markets and x) Cluster-wise measures to promote capacity-building and empowerment of the units and their collectives. Key schemes which have additional focus on Women or other social groups are described below.
Key policies and schemes relevant to food processing sector	***Influence on project's activities***
Technology Upgradation and Quality Certification	
Financial Support Micro, Small & ZED 1 shall be an Certification Scheme	**Nature of assistance:** Provided by the Government of India, the subsidy for Medium Enterprises will be 80%, 60% and 50% respectively. There to MSMEs in additional subsidy of 5% for MSMEs owned by SC/ST/women.

		Pattern of Assistance: All manufacturing Micro, Small and Medium enterprises (MSME) having Udyog Aadhaar Memorandum can apply.
Entrepreneurship and Skill Development Programme		
1	Assistance to Training Institutions (ATI)	**Nature of assistance:** 20% of the total targeted of ESDPs (Entrepreneurship Development Programs) are conducted exclusively for weaker sections of the society such as the SC/ST communities and women with a stipend of Rs.500/- per month per candidate under the Promotional Package for MSEs. No fee is charged from the candidates under these programs. **Pattern of Assistance:** These programs are conducted by MSME-DIs of Ministry.
Infrastructure Development Program		
1	Micro & Small Enterprises Cluster Development (MSE-CDP)	**Nature of assistance:** Hard interventions such as setting up of Common Facility Centers with maximum eligible project cost of Rs 15.00 cr with GoI contribution of 70% (90% for special category States and for clusters with more than 50% women/micro/village/ SC/ST units). **Pattern of Assistance:** Clusters, Industrial associations/Consortia are applicable to apply for this scheme.

4.	*Pradhan Mantri MUDRA Yojana (PMMY)*
Objective and its responsibility	***Linkage and relation to IFPVAP's objective***
MUDRA (Micro Units Development & Refinance Agency Ltd.) was set up by the Government of India as a wholly owned subsidiary of Small Industries Development bank of India (SIDBI). This agency is responsible for developing and refinancing all microenterprises sector by supporting the finance institutions which are in the business of lending to micro / small business entities engaged in manufacturing, trading and service activities. It partners with Banks, MFIs and other lending institutions at state level / regional level to provide micro finance support to the micro enterprise sector in the country	The main interventions under this program are: 1. Shishu: This covers loans upto INR 50,000 2. Kishor: This covers loans above INR 50,000 and upto INR 5 lakh 3. Tarun: This covers loans above INR 5 lakh and upto INR 10 lakh The program covers food product activities such as papad making, achaar making, jam / jelly making, agricultural produce preservation at rural level, sweet shops, small service food stalls and day to day catering / canteen services, cold chain vehicles, cold storages, ice making units, ice cream making units, biscuit, bread and bun making, etc. The products being offered by MUDRA are designed in such a way that they meet the requirements of different sectors, business activities as well as business and entrepreneur segments. The funding support from Mudra is of four types: 1. Micro Credit Scheme 2. Refinance Scheme for Banks 3. Women Enterprise Program 4. Securitization of Loan Portfolio

Funding support from MUDRA	Influence on project's activities

5.	The Agricultural and Processed food Products Export Development Authority (APEDA)	
Institution, its objective and responsibility		***Linkage and relation to IFPVAP's objective***
The primary objective of APEDA is to undertake the development and promotion of export of various categories of raw as well as processed food products included in the First Schedule to the APEDA Act.		Other key objectives of the APEDA are: • Development of industries relating to the Scheduled products for export by way of providing financial assistance or otherwise for undertaking surveys and feasibility studies, participation in the equity capital through joint ventures and other reliefs and subsidy schemes • Fixing of standards and specifications for the Scheduled products for the purposes of export. • carrying out of inspection of meat and meat products in any slaughterhouse, processing, plant, storage premises, conveyances or other places where such products are kept or handled for the purpose of ensuring the quality of such products;
Key policies and schemes relevant to food processing sector		***Influence on project's activities***
1	APEDA is currently financing assistance to Agriculture and processes foods exporters through three major schemes: 1. Export Infrastructure Development 2. Quality Development 3. Market development	**Nature of assistance:** I. **Development of Export Infrastructure**: Financial assistance to the APEDA registered exporters for setting up of infrastructure such as pack house facilities with packing/grading lines, precooling units with cold storages and refrigerated transportation etc. It also intends to support equipment and technologies of various types of screening sensors to detect external / internal quality of the produce as well. **Pattern of Assistance:** Up to 40% of the total cost subject to a ceiling of Rs. 100 lakhs for each of the activities. All APEDA registered units can claim assistance based on the project profile. II. **Quality Development:** Implementation and Certification of quality and Food Safety Management Systems for all APEDA scheduled products for registered manufacturers and exporters only. (Food Safety Management System such as HACCP, India HACCP, ISO22000/FSSC-22000, BRC, ISO-14001, GAP, India GAP, GHP, ISO-9001 etc., in house quality control lab equipment, etc.) **Pattern:** up to 40% of the total cost subject to a ceiling of Rs. 4 lakh per beneficiary.

2.9. Requirement for consent to operate from pollution control board

v. Proposed project interventions will augment food processing sector in various parts of the country and also lead to development of supporting facilities for food processing sector. Mostly these units operate at smaller scale and comes under category B2 as per EIA notification rule 2006 and hence do not require Environment Clearance. However these units may require consent from state pollution control board for their operation and establishment. Requirement of consent from pollution control board is as per the categorization of industries.

vi. As per Air (Prevention and Control of Pollution) Act 1981 and Water conservation and preservation act 1974, units coming under the "Green", "Orange" and "Red" category require consent from pollution control board. Following table lists categorization of food processing industry

Table 10 - Categorization of the Industries as per the Central Pollution Control Board

Sector	Sub sector	Categories of Industries as per Pollution control Board			
		White	Green	Orange	Red
Packaged Food	Bakery	-	less than 1 TPD production	More than 1 TPD Production	-
	Snacks	-	Puffed rice (muri) (using gas or electrical heating system)	Chanachur and ladoo from puffed and beaten rice (muri and shira) using husk fired oven	-
Beverage	Non Alcoholic Beverage	-	-	waste water generation <100 KLD	waste water generation >100 KLD
Grain and Oilseeds	Flour Mills	-	Flour Mills (Dry Process)	-	-
	Rice mills	-	Rice mill (Rice hullers only) < 10 TPD	Rice mills having waste water generation < 100 KLD and fuel consumption less than 12 MTD	Parboiled Rice Mills having waste water generation 100 KLD and above (or) fuel consumption 12 MTD
Sector	Sub sector	Categories of Industries as per Pollution control Board			
		White	Green	Orange	Red
					and above (or) both
	Vegetable oils	-	Oil mill Ghani and extraction (no hydrogenation / refining)	having waste water generation < 100 KLD	-
Meat & Poultry	Slaughter house and Meat Processing	-	-	-	Slaughter house and meat processing industries, bone mill, processing of animal horn, hoofs and other body parts
	Fish Processing	-	-	Fish processing and packing (excluding chilling of fishes)	-
Dairy and Dairy Products	Milk process and dairy products	Packing of powdered milk	-	Dairy and dairy products (small scale)	Milk processes and dairy products(integrated project) (Large & Medium scale)
Fruit and Vegetable processing	-	-	-	Food and food processing including fruits and vegetables processing	-

2.10. Applicable World Bank safeguard policies

World Bank Operational policies act as guiding document during designing of a project to assess the possible environmental risks and the impacts associated with proposed interventions of the project. The process of applying safeguard policies is an important opportunity for stakeholder‘s engagement, enhancing the quality of project proposals and increase in ownership.

Bank‘s applicable operational policies are listed under:

Table 11 – Applicable World Bank safeguard policies

S No	Name of WB policies	Trigger (Y/N)	Remarks
1	Environment Assessment (OP/BP/GP 4.01)	Yes	Environmental assessment is required for proposed project to identify, avoid, and mitigate the potential negative environmental associated with the project. The Bank requires that proposed project for financing are environmentally sound and sustainable, and thus at decision making stage EA needs to be conducted. In view of this, the Environmental Assessment study has been conducted for this project
2	Natural Habitats (OP/BP 4.04)	No	Based on the environmental assessment, the team did not come across any situation, wherein value chain and project interventions was happening near National Parks, Wildlife Sanctuaries etc.
3	Physical- Cultural Resources (OP/BP-4.11)	No	Based on the environmental assessment, the team did not come across any situation, wherein value chain and project interventions was happening near any ancient monument or sites or sites of cultural importance.
3	Pest Management (OP 4.09)	Yes	The procurement of any pesticide in a Bank-financed project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and the intended users. With respect to the classification of pesticides and their specific formulations, the Bank refers to the World Health Organization's Recommended Classification of Pesticides by Hazard and Guidelines to Classification. The following criteria apply to the selection and use of pesticides in Bank-financed projects: • They must have negligible adverse human health effects. • They must be shown to be effective against the target species. • They must have minimal effect on non-target species and the natural

S No	Name of WB policies	Trigger (Y/N)	Remarks
			environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them. • Their use must take into account the need to prevent the development of resistance in pests.
4	Forest (OP 4.36)	No	The bank requires to screen as early as possible potential impacts on forest health and quality and on the rights and welfare of people who depend on them. Based on the environmental assessment, the team did not come across any situation, wherein any development activities was taking place in the reserved or scheduled forest area.

3. Environmental baseline of surveyed food processing sectors

3.1. Introduction

i. This chapter describes the baseline environmental profile of the major food processing sectors in India. The environmental profile includes key environmental issues and their management, as well as issues regarding food safety, health and hygiene.

ii. The Food processing industry can be categorized in the following broad segments, which is similar to the categorization followed by Ministry of Food Processing Industry.

- Dairy product processing,
- Fruits & vegetable processing,
- Grains and oilseed processing including spice manufacturing,
- Packaged food processing (Bakery, Snacks and Savories)
- Meat and poultry processing
- Beverages and packaged drinking water

iii. The value chain in the food and beverages industries usually begins with the outputs of the agricultural, dairy, meat, poultry or fisheries sector and proceeds to deliver products for wholesale and further processing or immediate consumption. This involves the production, processing and preservation of meat, fish, fruit, vegetables, oils and fats, the manufacture of dairy products and the milling of grain, as well as the manufacture of alcoholic and non-alcoholic beverages.

iv. Environmental issues in food and beverage processing facilities primarily include solid waste generation, effluent and untreated wastewater release, energy consumption as well as emissions to air. At the same time the overall hygiene and quality of working environment and workers especially food handlers can directly impact the safety of food, (leading to an exposure of biological or chemical hazard.

v. This section of Environmental assessment describes a baseline of current food processing practices followed by micro enterprises especially in the informal (unregistered) food processing sector in India. It covers aspects such as key environmental, health and safety, food safety, health and hygiene and effectiveness of regulatory mechanisms.

vi. In this section, the environmental baseline is established for each category of food processing industries as described above. Firstly, the key environmental, food safety and quality issues associated within the various food processing categories at an industry wide level have been elaborated through secondary research. This includes various reports and articles as well as the Environmental, Health, and Safety Guidelines for food processing industries developed by IFC. This is followed by observations derived from the primary data and stakeholder consultations based on the field trips undertaken in the target districts in four states.

vii. The prime objective of establishing a baseline of environmental performance and working conditions of the focus food processing industries is to identify the potential and likely environmental risks and impacts of proposed project activities. This will facilitate the development of an implementable and practical mitigation actions reduce the identified environmental impacts and risks.

viii. Key environmental characteristics are described for the studies major food processing sectors, based on the review of secondary information/ data collected from the respected departments, literature/ journals and websites. These characteristics are complimented with observation obtained from the field visits in project districts, to understand the exact nature of risks and challenges prevailing within the unorganized units in various sectors. (The details of sites visited and key challenges associated with each unit is presented in Appendix A)

ix. *Note:* During the field survey we have observed that meat processing and poultry product processing in value added products and beverage and packaged drinking water segments are not present in units defined by Micro enterprise. They are mostly present in small to medium scale industries due to the nature of investment and workforce required in such plant's operations. Hence, going forward these two value chain are not elaborated as part of environmental baseline. The environmental baseline is limited to 4 sectors i.e. dairy product processing, fruits and vegetable processing, grains and oilseeds and packaged foods.

3.2. Environmental, health, safety, hygiene and food safety profile

3.2.1. Dairy Products (Fresh and Value Added Dairy Products- VADP)

x. India is globally the largest producers of milk and value-added milk products. India is also the world's largest producer and consumer of dairy. Livestock in general and dairying in particular play a vital role in the Indian economy and also in the socio-economic development of millions of rural households.

xi. Currently, 48% of total milk produced is either consumed at the producer level or sold to nonproducers in the rural area. The balance 52% of the milk (marketable surplus) is available for sale to consumers in urban centers. Of this 52%, currently, about 40% of the milk sold is handled by the organized sector (Dairy Cooperatives & Producer companies-20% & Private Dairies- 19%) and the remaining 60% by the unorganized sector. (Ref: data for 2015-16 published by National action plan for dairy development - 2022 by Department of Animal Husbandry, Dairying and Fisheries).

xii. Uttar Pradesh, Maharashtra, Himachal Pradesh, Madhya Pradesh, Punjab, Rajasthan, Tamil Nadu are the major production area of Dairy Products in India.

xiii. Uttar Pradesh is the largest milk producing state in India contributing around 17% to the total milk production, followed by Rajasthan, Gujarat, Madhya Pradesh and Andhra Pradesh contributing 12%, 8%, 8% and 7% respectively. (Ref: Fruits & Vegetables, Dairy & Poultry -Leveraging the Diverse India Opportunity, MoFPI, 2017)

xiv. In Indian dairy industry, milk products like curd, buttermilk, ghee, butter, ice cream and paneer can be classified as traditional VADPs which have a huge unorganized market and driven by increasing trend of nuclear families.

xv. India is witnessing increasing consumption of emerging VADP like flavored cheese, flavored milk, yogurt, whey, etc. These are hugely underpenetrated categories. Currently, due to conventional culture, commodity dairy products like liquid milk and SMP contribute ~66% of total dairy industry, followed by traditional dairy products (ghee, paneer, curd, buttermilk, butter and ice-cream) forming ~32%, and emerging VADP (cheese, whey, UHT, flavored milk, yogurt) accounting for mere ~2% of market. (Ref: India Dairy: Crème de la crème: Milking the value chain, Edelweiss, 2017).

3.2.1.1. Spread of dairy processing units across India (Micro) as per FSSAI data

xvi. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 12 – Spread of Micro units across India for dairy processing as per the FSSAI List

S No	Particular	India		
		Central	State	Registration
1	Collection Centers	0	478	1825
2	Dairy processors	4714	18824	30830
3	Retailers	6	29	15
4	Transporters	0	1	54
5	Total	*4720*	*19332*	*32724*

xvii. Out of the above, the following dairy product processing units have been covered as part of the primary field survey in shortlisted districts:

Table 13 – Coverage of enterprises for dairy across the different districts of the selected states for the assessment

Type of Units	Punjab		Uttar Pradesh		Maharashtra		Andhra Pradesh	
Districts	Sangrur	Moga	Aligarh	Fatehpur	Nashik	Washim	Vizianagaram	Prakasam
Total covered	4	6	5	4	5	8	0	1
Dairy units	4	4	4	1	5	5	0	1
Ice – Cream units	0	2	1	3	0	3	0	0

3.2.1.2. Value chain assessment for dairy industry (Micro units)

xviii. Key aspects of dairy value chain are described in the table below:

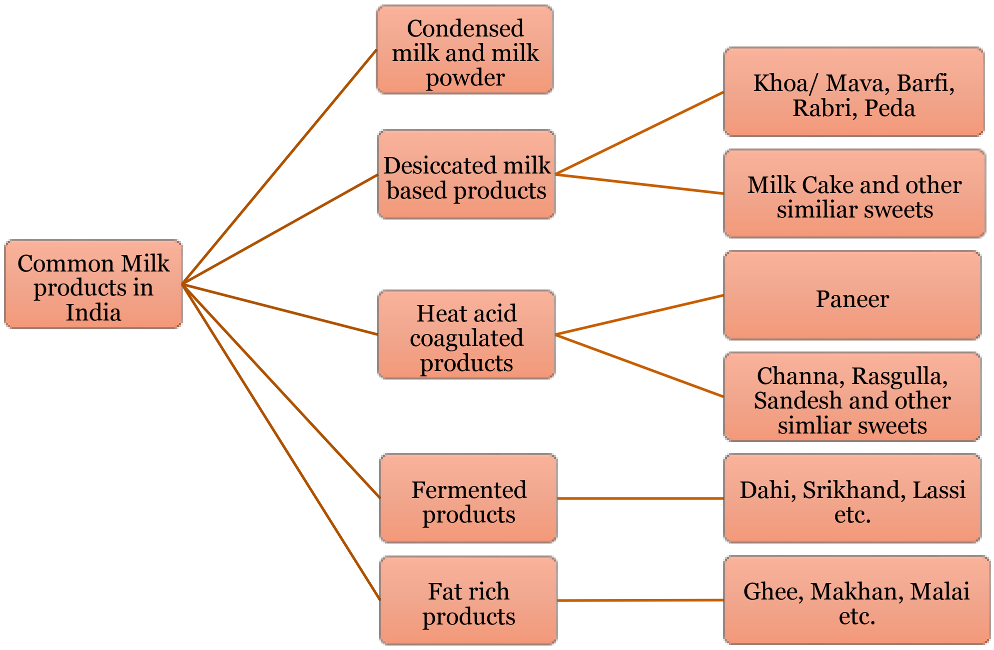
Table 14 – Key characteristics and requirements for the Dairy value chain

S No	Key characteristics and requirements for the Dairy value chain
1	Milk being highly perishable and considering the tropical climate of India, handling of raw milk is the most critical activity of entire dairy value chain. Poor handling of raw milk at village level with non-existent or inadequate chilling facilities impacts subsequently the quality and safety of processed milk and milk products.
2	Raw milk shall be cooled immediately to the temperature of 4-6°C or lower and maintained at the temperature until processed. Milk should be carried in Stainless Steel utensils/ Stainless Steel Cans.
3	The chilled milk should be transported in insulated tankers to the processing plants. The first thing which should be done at reception is to determine the quality of milk.

4	Post reception, the milk is skimmed of fat content, pasteurized and packed to be sold as packed liquid milk or processed further into different milk products.
5	For further processing, milk is either spray dried, desiccated (removal of water to obtain a condensed residue), coagulated to form cottage cheese and similar products, fermented to form curd and similar products or producing the fat rich content by simmering clarified butter.
6	The final product is packaged and then sold as per the applicable packaging and temperature requirements.

xix. Most common types of Indian milk based products can be described as below:

Figure 1: Common types of Indian milk based products for the Dairy processing Industry



xx. General characteristics of waste generated from a dairy product processing units is described below:

Table 15 – General characteristics of the waste generated from the Dairy processing industry

Waste characterization	**Due to the presence of milk solids (e.g. protein, fat, carbohydrates, and lactose), untreated wastewater from dairy processing facilities may have a significant organic content, biochemical oxygen demand (BOD), and chemical oxygen demand (COD)**
	The waste water of dairy contains may also contain inorganic salts, besides detergents and sanitizers used for washing

	The sweet whey form the most polluting effluent by its biochemical composition rich in organic matter (lactose, protein, phosphorus, nitrates, nitrogen) and is from 60 to 80 times more polluting than domestic sewage

Key activities and source of waste generation	The washing and cleaning out of product remaining in the tank, trucks, cans, piping, tanks and other equipment is performed routinely after every processing cycle. Wastewater originates from: receiving station, bottling plants, cheese factories, butter plant, casein plant, condensed milk plant, dried milk plant, and ice cream plant. Wastewater also comes from water softening plant
	Spillage is produced by leaks, overflow, freezing-on, boiling over and careless handling.
	Processing losses include, sludge discharge from settling tank in case a treatment plan is installed, discharges from bottles and washers, splashing and container breakage in automatic packaging equipment
	Detergents and other compounds are used in the washing and sanitizing solution that are discharged as wastes
Key impact of dairy product waste on environment	Effluent from – Tankers/ receptacles/ equipment washing and cleaning and spills management. When discharge in surface water sources, it has a potential to cause: • Rapid DO depletion problem • Growth of sewage fungi covering bottom of stream and hydraulic structures may occur. • Wastewater also carries bacteria responsible for tuberculosis. • At certain dilution can be toxic to fishes Air emissions – Combustion gases from fuel used for heat production, milk powder dust refrigerant gases and odor from production process and stagnating waste Solid waste – process waste, damaged products and out-of-date products

3.2.1.3. Performance of surveyed dairy products processing units

xxi. The basic raw material in the dairy industry is milk (from cows and/or buffalo). As fresh milk is highly perishable, it needs to be chilled to about 4° C and retained at this temperature so that it does not get spoiled during storage and transport for further processing.

xxii. Across all the target states, we have observed that the farmers sell milk to formal value chains, as cooperatives [Punjab State Cooperative Milk Producers' Federation Ltd (MILKFED), Pradeshik Cooperative Dairy Federation in Uttar Pradesh, Maharashtra Rajya Sahakari Maryadit Dugdh Mahasangh, Andhra Pradesh Dairy Development Cooperative Federation Ltd (APDDCF)] private domestic processors; MNCs and informal buyers comprising of vendors and consumers. Vendors, who aggregate milk from dairy farmers for retail sales to urban consumers including households, halwais (sweet-makers), restaurants, tea-stalls, and so on. Dairy farmers also sell milk directly to consumers including local ones in close proximity. Basis the above flow of milk, three broad categories of milk processing units can be developed:

i. Dairy farms in rural to semi-urban areas that do not transport the produce to a long distance and contribute to fresh consumption or preparation of fresh dairy products without pasteurization
ii. Chilling centres;
iii. Dairies in urban areas that purchase from Chilling centres / collection centres or from other traders.

xxiii. Chilling centres are located in remote villages to collect the fresh milk from various local cooperatives. The fresh milk is graded, weighed, chilled, sampled, loaded in tankers and dispatched to processing plants (dairies). Often, chilling centres may have bulk milk cooling tanks (BMCs), which are large storage tanks for chilling and holding the milk at a low temperature till such time as it can be transported to the dairies.

xxiv. Dairies product processing units in urban areas receive chilled milk from chilling centres and process it to make packaged milk for distribution, as well as to manufacture various products like butter, cheese, curd, ghee, paneer (cottage cheese), milk powders, ice cream, flavoured milk, sweets, etc.

xxv. The process of pasteurization is adopted only when the milk is obtained by the dairy product processing industry from a BMC or an organized milk collection centre. Pasteurization of the milk is undertaken to destroy the microbes that would otherwise spoil it. Pasteurization is carried out by heating the milk rapidly to around 80 °C, and holding it at that temperature for about 15 seconds. In all other cases, milk is simply boiled and then cooled for consumption as raw milk or for processing of fresh dairy products.

xxvi. The value chain for milk product processing industry can be described below:

Figure 2: Value chain of Dairy processing Industry covered as a part of the assessment

Production of Milk in Farms	Procurement of unprocessed milk	Processing	Marketing and Retailing
Small, medium, large or marginalized cattle owners/farmers with cattle	• Milkmen • Cooperative societies/collection centres • Processors • Household		• Directly to consumer through own shop • Retailers • Wholesalers • Hotels

Components	Paneer	Ghee and Butter	Khoya	Ice Cream Processing
Inputs	Milk (raw material) Gas Electricity	Milk (raw material) Gas Electricity	Milk (raw material) Gas Electricity	Milk, Sugar, Eggs (raw material), electricity
Process	Boiling Citrus addition Curdling Straining Packing	Boiling Fat skimming Stirring Heating Churning Straining Packing	Simmering of milk Packing	Boiling Mixing of ingredients and flavours Setting Packing
Equipment	Burner Strainer Deep Freezers	Burner Skimmer Blender Deep Freezers	Burner Weighing machine Deep Freezers	Boilers/Burners Batch freezer Homogenizer Candy Machine Deep Freezers
Output	Paneer Waste water	Ghee, Butter and Buttermilk Waste water from cleaning & washing	Khoya Waste water from cleaning & washing	Ice cream Waste water from cleaning & washing Saline water from batch freezer

xxvii. Resource requirements and general features of units engaged in processing of dairy products is described below:

Table 16 – Key characteristics of surveyed Dairy processing Industry

Parameters	Observation
Land requirement	The covered area requirements varies as described below:
	• Units with area 100 m^2 and under Approximately 44% of the total units covered (spread across 4 states) for dairy products and ice-cream • Units with area more than 100 m^2 but under 500 m^2 Approximately 50% of the total units covered (spread across 4 states) for dairy products and ice-cream • Units with area more than 500 m^2 Approximately 6% of the total units covered (spread across 4 states) for dairy products The average unit size can be considered around 210m^2.
Water requirement	• ***Process water requirement*** ○ Water is used for water based chillers, boilers ○ Water is also used in water based freezers in the form of saline water for the Ice-cream manufacturers • ***Cleaning and domestic water requirement:*** ○ Significant water is being used for cleaning of the equipment and unit for disinfection and hygiene requirements ○ The maximum requirement for such units is 1KLD per month depending upon the quantity of milk procured. • ***Source of water:*** ○ The most common sources water are groundwater and water supplied from municipal sources (equal proportion of both the cases are observed). However, some units were also dependent on water tankers to meet their water requirements ○ None of the units utilize any treated water for drinking purpose.
Power sources	• Backup power is essential for all the dairy and ice-cream manufacturing units to maintain the chiller/ freezer operation. • 10 units were found to be using Diesel powered generator sets for back-up power. Out of these 10 units – 6 were dairy product units, 4 were ice-cream manufacturers.
Manpower requirement	The average manpower employed at the unit covered under the assessment were: ○ Dairy product units: 1 – 12 workers ○ Ice-cream units: 2 – 12 workers

3.2.1.4. EHS performance of surveyed dairy products processing units

xxviii. A summary of key environmental issues associated with the operations of the dairy processing units (small holder and micro units) and their management as observed during field visits, is described in below table.

Table 17 - Key Environmental and Occupational Health & Safety Issues observed for the Dairy processing Industry

S No	Environmental Concerns	Observations from Field
1	Generation of wastewater and its management	• During field work, waste water generation was observed from process of paneer manufacturing, washing of utensils, storage containers, water from chiller, cleaning of floors etc. • The waste water from such activities may contain high level of BOD, COD and organic content due to presence of protein, fat, lactose etc. form milk and cleaning agents/detergent. • None of the units have installed any effluent treatment plant, all the units were found discharging the wastewater directly in their drainage

		system □ None of the units have undertaken any testing of their effluent discharge parameters.
2	Management of cleaning chemicals	• The operators were not aware whether cleaning agents and disinfectants is of food grade quality. • The practice of labelling of cleaning agents is weak and in many units they were not being stored in a designated area away from food production
3	Generation of solid waste and its management	• Used oil generate from Diesel Generator (DG) sets is hazardous in nature. However, quantity of used oil generated from the DG Sets is very nominal. • The most common form of solid waste is plastic packaging waste like polythene packs etc. • Some of the units in Uttar Pradesh and Maharashtra dependent upon cow dung cake, wood and husk as fuel for earthen stove. Boiler was installed in one unit in Maharashtra where wood is used as fuel. • Ash generated from the above fuel constitutes another stream of solid waste from these type of units. • Packaging waste are picked up by local waste collectors/municipality • Ash is disposed off at nearby locations • Used oil generated from DG Sets are taken back by the DG Set Service agency.
4	Air emissions and management	• Most of the visited units were not equipped with any facilities with potential of significant emission generation like Boiler. Only one unit in Maharashtra had Boiler (wood used as fuel). Boiler is potential source of PM, CO, CO_2, SO_2 and NOx emission. • Electric operated oven, burners, earthen stoves are used as equipment for heating (the milk). Diesel fired burners and earthen stoves based on husk, fuel wood etc. are also bring used for heat generation. Emission from diesel burner may contain NOx, CO, CO_2, HC etc. whereas mission of earthen stoves may contain Particulate Matters, CO_2, CO, NO_2, SO_2 etc. • For power backup, some units were equipped with Diesel Generator Sets. The occasional use of DG sets may cause minute level of emission containing NOx, CO, CO_2 to some extent. • None of the units have undertaken any indoor air quality assessment. • None of the units had undertaken stack emission testing.
S No	Occupational and Food Safety concerns	Observations from Field

1	Physical Hazards	• It was observed that there is risk of accidental spillage of hot milk/ contact burn during the process of manufacturing various products/handling of hot material filled container. There is no provision for heat resistance gloves, shoes or aprons in any of the visited units. • Risk of electric shock due to non-grounding/ weak connections of all electrical equipment and installations. There is no schedule of preventive maintenance of insulation level for electrical wires and connections. • Around 22% of units have a congested workspace wherein machines
		and storage material obstructs walkways and pathways. □ About 18% of the units (across all states) have a first aid kit or common first aid equipment like band-aids, cotton, gauges, antiseptic and anti-burn creams. Remaining 82 % did not have any provision for treatment of minor injuries.
2	Chemical hazards	□ Since the process does not involve usage of any toxic chemicals, there is no risk of exposure to a chemical hazard.
3	Fire Safety and emergency prevention	□ Majority of units did not have any fire prevention mechanism such as stored water or sand bucket etc. □ Lack of awareness on risk due to fire as well as adequate preventive mechanisms and evacuation techniques were observed. This is a significant concern area given the congested setting of the workplace. □ None of the units have attended any formal fire safety or prevention training. □ Most of the units are not aware of regulatory requirements for obtaining a fire NOC.
4	Ergonomics and other risks due to current working practice	□ No such severe ergonomics risk to workers is observed from these type of units.

xxix. The Central Pollution Control Board 'Classification of Industries' lists the applicability of the 'Consent to Operate' for the different processes for the food processing sector basis the environmental pollution caused by them. It was observed that small scale dairy & dairy product and Ice-cream manufacturing units fall under orange category; thus qualify for obtaining Consent to Operate (CTO) from respective state pollution control board since no specification on quantum of product manufactured, volume of waste generated etc. has been stipulated as such for the sector.

It was observed that only 2 units (all from Uttar Pradesh) of all the visited units operating in Milk and Dairy Processing sector possess a valid Consent to Operate from State Pollution Control Board.

3.2.2. Fruits and Vegetables based processed products

xxx. Fruits and vegetables account for nearly 90% of total horticulture production in India. India is now the second largest producer of fruits and vegetables in the world (with a production of 259 million MT) and is the leader in several horticultural crops, namely mango, banana, papaya, cashew-nuts, areca nut, potato and okra. (Source: National Horticulture Board, year).

xxxi. The area under fruit crops cultivation has increased from 5 million hectares in 2004-05 to 6.24 million hectares in 2014-15. India accounts for about 13 per cent of the total world production of fruits and leads in the production of mango, banana, papaya, sapota, pomegranate, acid lime and amla. (Source:

xxxii. In India, the wastage of fresh fruit, produce has been estimated to be of a very high order, around 30-35% of the total production. This is spread across the value chain activities - during harvest, storage, grading, transport, packaging and distribution. The fruits and vegetables being highly perishable need storage under controlled conditions to prevent losses. Therefore, cold storages are of utmost importance for efficient functioning of fruit and vegetable value chains.

xxxiii. A large share of Fruits and vegetables processing industry lies in the unorganized sector (in 2010, it was reported to be around 48% of total F&V processing). While products like juices and pulp concentrates are largely manufactured by organized manufacturers, the unorganized sectors foothold is in the traditional areas of processed items like pickles, ketchup and squashes. By size, pickles form the strongest category.

xxxiv. Key aspects of fruits and vegetables processing industry in India is described in table below:

3.2.2.1. Spread of micro units across India FSSAI data

xxxv. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 18 – Spread of Micro units across India for Fruits & Vegetables processing as per the FSSAI list

S No	Particular	India		
		Central	State	Registration
1	Fruits processors	2199	5192	242
2	Vegetable processors	1298	2684	5239
3	Retailers	11	80	6
4	Transporters	0	3	1
5	*Total*	*3508*	*7959*	*5488*

xxxvi. Out of the above, the following fruits and vegetable processing units have been covered as part of the primary field survey in shortlisted districts:

Table 19 – Coverage of enterprises for Food & Vegetable processing in shortlisted districts

Type of Units	Punjab		Uttar Pradesh		Maharashtra		Andhra Pradesh	
Districts	Sangrur	Moga	Aligarh	Fatehpur	Nashik	Washim	Vizianagaram	Prakasam
Total covered	2	5	3	5	4	3	2	2
Pickles, Murraba, Sherbet, Ketchup etc.	2	5	3	4	0	3	2	2
Jaggery	0	0	0	0	2	0	0	0
Others	0	0	0	1	2	0	0	0

3.2.2.2. Value chain assessment for F&V units (Micro units)

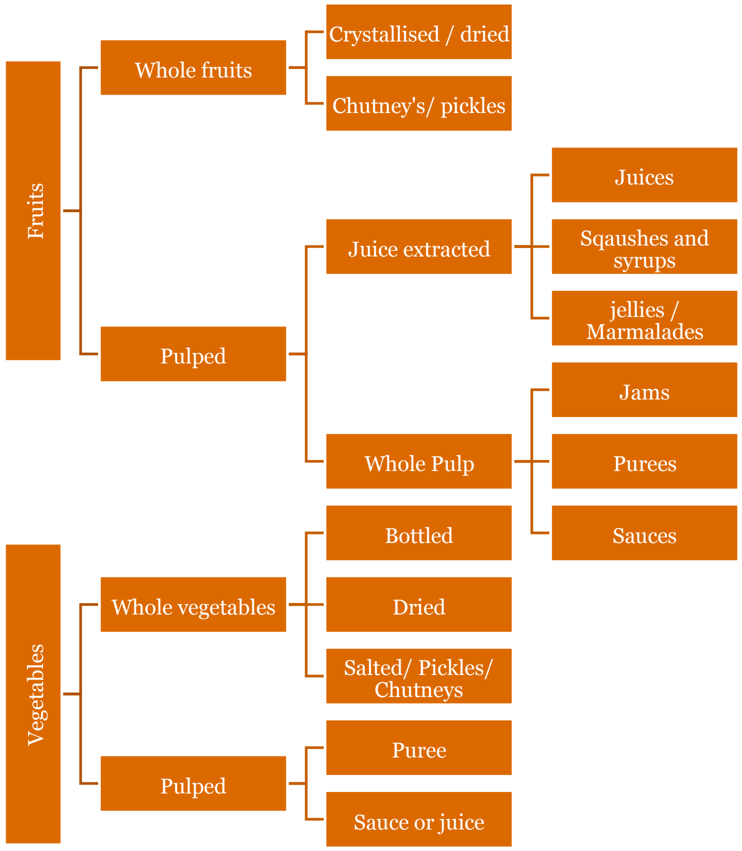
xxxvii. Key aspects of fruits and vegetables value chain are described in the table below:

Table 20 – Understanding the fresh fruits & vegetables supply chain models in India

S No	Understanding the Fresh Fruits and vegetables supply chain models in India
1	• The unorganized retail sector dealing in Fruits and Vegetables follows a traditional procurement model. In this model farmers bulk sell to agents and auctioneers, who in turn sell to wholesaler. The processing industry procures mainly from agents and wholesalers, the consumers procure from individual sellers who are supplied by wholesalers. • This model is characterized by number of inefficiencies with it. Cane baskets and jute or gunny bags are used in handling vegetables. Loading and unloading are carried out manually. Vegetables are not cleaned and washed of dirt and soil. No sorting, grading and packaging of any kind is being done. No temperature controlled storage or warehousing is used across the chain. Information technology and advanced management techniques are not deployed. Also the distribution of selected commodities in the traditional market channel involves multiple intermediaries and high cycle times (Reddy, 2009). A large chunk of fresh fruits and vegetables is lost because of inadequate post-harvest handling and lack of cold storage, processing facilities and convenient marketing channels (Reddy, 2010). All these factors also contribute to quality degradation and higher cost (Veena, 2011)
2	The organized sector as well as hypermarket/ supermarket stores dealing in sale of fresh fruits and vegetables, usually adopt the following approach: • When procurement is undertaken through dedicated vendors, then orders with vendors are placed daily and received early in the morning to ensure freshness. These vendors have small storage facilities which aren't refrigerated and thus wastage rates are high. The wastage further increases during heavy rains, especially in the case of leafy vegetables. The procuring brand may have its own refrigerated storage but in limited capacity. Transportation cost is usually borne by vendors while packaging cost and other costs (if any) are borne by the store. • As a direct sourcing option, farmers transport vegetables from farming location to the buying centers (also known as collection centers). Small farmers and contract farmers are the primary source of supply of vegetables. Vegetables are transported from buying centers to distribution center (or city processing centers) in both temperature-conditioned and unconditioned trucks. A distribution centre is served by one or more buying centre and a buying centre serves one or more distribution centre. Vegetables are cleaned and then sorting and grading is undertaken at the distribution centre. • Distribution centre also buys small volume of vegetables from the local wholesale market (mandi) to balance demand supply gap. Fresh vegetables are then transported from distribution centre to stores in small trucks. A store is served by only one distribution centre.

xxxviii. Most common types of Fruits and Vegetables based products can be described as below:

Figure 3: Common types of fruits & vegetables end products



xxxix. General characteristics of waste generated from a fruits and vegetable product processing units involves the following aspects (Source: IFC EHS guidelines for food and beverage, CPCB guidelines and other research articles)

Table 21 – General characteristics of the waste generated from the Fruits & Vegetable processsing industry

Waste characterization	• The major waste streams are organic waste (including fruit and vegetable rejects, peel and pomace) and other raw material wastes. Washing processes and packaging activities also generate waste. Organic waste types may vary depending on the season and also contribute to waste water • The fruit and vegetable industry typically generates large volumes of effluents and solid waste. The effluents contain high organic loads, cleansing and blanching agents, salt, and suspended solids such as fibers and soil particles. They may also contain pesticide residues washed from the raw materials. • The main solid wastes are organic materials, including discarded fruits and vegetables. • Odor problems can occur with poor management of solid wastes and effluents;

Key impact of Fruits and vegetables product waste on environment	- Large volumes of liquid wastes are created in fruit and vegetable processing and these should be carefully disposed of to prevent local pollution of streams or lakes. If mains drainage is not available, a soakaway should be constructed in a place that cannot contaminate drinking water supplies. Water should not be allowed to simply soak into the ground, because this will create swampy conditions, which attract insects that contaminate products, as well as introducing a health hazard. - Solid waste disposed to landfill adds to the burden already placed on these sites. There is a high potential or converting the solid waste into compost or manure or to be used a feed for animals. - Chemical usage in F&V may include such items as sanitizers, lubricants, pest control chemicals used within a processing facility and water treatment additives, plus chemicals added to the manufacturing process for a specific process. These may form part of effluent generation.

3.2.2.3. Understanding the performance of surveyed units (F&V)

xl. The basic raw material required for such units are local fruits and vegetables which are readily available and seasonal in nature. They are complimented by salt, sugar, vinegar and oil which are required to make the final products – pickle, jams, chutneys, fruit squash and ketchup.

xli. The fruits and vegetables processing industry involves similar processes throughout its value chain. The fruits and vegetables are directly or indirectly procured from the local vegetable 'mandi' or from farms where the fruits and vegetables are grown. Once procured, the fruits and vegetables are washed, peeled and cut. After they are cut in the required sizes, the pieces are boiled and stirred while compliments such as salt, sugar, vinegar and oil are added. Once the mixture has cooled, it is put in jars and containers ready to be sold to the local community through their own shops or through local retailers.[1]

xlii. It was observed that in most of the units, sodium benzoate was used as a common ingredient to preserve the raw material for a long period of time. This gave rise to all year round production and steady income.

xliii. The value chain for Fruit and Vegetable processing industry can be described as below:

Figure 4: Value chain of the Fruit and Vegetable processing industry covered as a part of the assessment

Production of fruits and Vegetables on Farms	Procurement of Raw Materials	Processing	Marketing and Retailing
Small, medium, large farmers	• Local *mandi* • departmental stores • own produce	↓	• Directly to consumers through own outlet, • Retailers • Nearby cities • Govt. Cooperative society

[1] http://www.fao.org/3/a-au116e.pdf

Components	Pickles, Murabba/Jams, Chutney, Ketchup, Squash, Sherbets	Jaggery Production	Others – Canned Vegetables and Powdered Vegetables
Inputs	Raw Materials - Fruits and Vegetables such as Amla, Lemon, Apple, Mustard oil Additives - Sugar, Salt, Spices	Sugarcane Skimming agent Juice extractor run on DG Burner Plastic for	Vegetables such as Mushrooms and other vegetables Water for cleaning Heat, for boiling
	Preservatives - Acetic acid, Vinegar, Nabenzoate Water for cleaning Heat, in case boiling is required	packaging	
Process	Sorting (manual/with machines) and grading Washing Air drying Peeling Cutting Mixing ingredients Boiling as required Crushing Aging Packing	Extraction of juice Removal of impurities Boiling Solidification of boiled product into Jaggery Packing	Boiling Drying Mixing Crushing Powder making Packing
Equipment	Sorting machine Boiler, Burner (organic fuel, natural gas, diesel and electricity) Crusher Large steel/aluminium containers for mixing Balance Packing and sealing machine	Juicer Burner based on locally available organic material	Burner Packing machine Grinder
Output	Pickle, Murabba/Jams, Ketchup, Chutney, Squash, Sherbets Refused water Organic waste Empty drums and containers Ash from burner and burning from organic fuel Refused oil, grease	Jaggery Organic waste Refused, cleaning water Ash from Burner Hazardous waste (used oil from DG in minute quantity)	Canned Mushroom Vegetable powder Vegetable peels and other waste

.

xliv. Resource requirements and general features of units engaged in processing of Fruits and Vegetables Processing is described below:

Table 22 – Requirement and General featues of the Fruits & Vegetable processsing industry

Parameters	Observation
Land requirement	The covered area requirements varies as described below: • Units with area 100 m² and under Approximately 74% of the units spread across states for pickle, Jaggery and other vegetable products • Units with area more than 100 m² but under 500 m²

	Approximately 16% of the units spread across states for pickle units - Units with area more than 500 m^2 Approximately 11% units spread across states for pickle units The average unit size can be considered around 140m^2.
Water requirement	• ***Process water requirement*** ○ No significant amount of water in used for the process. The water is used for boiling for the preparing some of the products such as pickle, murraba etc. ○ Apart from the process, some water is also being used for boilers operations which was found in one of the units • ***Cleaning and domestic water requirement:*** ○ Moderate water is being used for cleaning of the equipment and units for disinfection and hygiene requirements ○ The standard requirement for such units is between 0.50 KLD to 1 KLD per month depending upon the magnitude of the operations. • ***Source of water:*** ○ The most common sources water are groundwater and water supplied from municipal sources out of which approximately 65% of the units are using groundwater for their water requirements. ○ None of the units utilise any treated water for drinking purpose
Power sources	• All the units covered were getting the electricity from the main GRID. However, due to some power supply issues 20% of the units also had Diesel powered generator sets for back-up power. • 6 units were found to be using Diesel powered generator sets for back-up power. Out of these 6 units – 5 were pickle manufacturers and 1 was manufacturing canned vegetables.
Manpower requirement	- The average manpower employed at the unit covered under the assessment were: ○ Pickle units: 1 – 24 workers ○ Jaggery: 2 – 10 workers ○ Other vegetable units: 1 – 20 workers

xlv. Following is a list of key regulatory permits which are essential for such units:

Table 23 – Key Regulatory Permits required for the Fruits & Vegetable processsing industry

S No	Regulatory requirements	Applicable (Yes/No)
1	Consent from Pollution Control Board	Yes
2	Factories license	Yes, in case of 10 or more workers or 20 in case of Maharashtra
3	Shops & Establishment Registration	Yes
4	FSSAI License/Registration	Yes

3.2.2.4. EHS performance of surveyed F&V units

xlvi. A summary of key environmental issues associated with the operations of the Fruits and Vegetables units (small holder and micro units) and their management as observed during field visits, is described in below table.

Table 24 – Key Environmental and Occupational Health & Safety issues observed for the Fruits & Vegetable processsing Industry

S No	Environmental Concerns	Observations from Field
1	Dust generation, Air emissions, Noise Generation and management	• Fruit and vegetable processing does not create any significant air emission or noise generation. Minor emission from the process of burning of fuel (like diesel, organic fuel like husk, wood etc.) for boiling and heating activity is observed. • No such mitigation measure is taken by the units for such type of minor emission • Out of visited units only 1 (in Punjab) was equipped with boiler (operated by fuel wood). The emission of boiler may contain PM, SO_2, NOX, CO, CO_2 etc. As indicated by the unit owner, scrubber is installed in boiler as mitigation device. However, no maintenance is undertaken. • Short term, localized spice dust may be generated at the time of mixing of spices. Usual exposure to such type of dust is mitigated by covering nose and mouth with piece of cloth.
2	Generation of wastewater and its management	• Cleaning of raw materials & cleaning of workplace are the key source of wastewater generation. • Waste water is disposed generally in municipal drainage system. None of the unit had any setup for treating waste water. • The wastewater may contain high level so of pesticide residue. However, none of the unit are undertaking any wastewater testing before releasing the wastewater.
3	Generation of solid waste and its management	• Solid waste in the form of semi-finished and scrap finished product, rotten raw materials is found in considerable amount in these units. These are organic in nature and disposed through waste collector or used as manure. • Some of the units also use cow dung cake, wood and husk as fuel for earthen stove. Boiler was installed in one unit in Punjab where wood is used as fuel. Ash generated from such burnt fuel are also found to be another source of solid waste from these type of units. • The ash is disposed at nearby location. • Among other type of solid waste streams are packaging material like gunny sacks (jute, propylene), cardboard box, plastics etc. These type of waste are sold to rag pickers or picked up by the local municipal waste collectors. • Used oil generated from Diesel Generator (DG) sets is hazardous in nature. The quantity of used oil generated from the DG Sets is very nominal. Used oil generated from DG Sets is usually handled by the service agency.
S No	**Occupational and Food Safety concerns**	**Observations from Field**

1	Physical Hazards	• Most of the fruit and vegetable processing units had designated place for the wet processes like cleaning of raw materials, utensils. • Most of the unit did not have any heavy equipment. • Spillage of hot fluid (in the process of making ketchup, sherbet) is possible due to improper handling. • Short term, localized spice dust may be generated at the time of mixing of spices.
		Only 31% of the units (across all states) have a first aid kit or common first aid equipment like band aids, cotton, gauges, antiseptic and antiburn screams. Remaining 69% did not have any provision for treatment of minor injuries.
2	Biological and chemical hazards	The seasonal raw materials (fruits and vegetables) are stored in Nabenzoate solution to ensure its yearlong availability. It is generally known as safe ingredient. No other significant hazard from chemical or biological factor is anticipated
3	Fire Safety and emergency prevention	Majority of units did not have any fire prevention mechanism such as stored water or sand bucket etc. Lack of awareness on risk due to fire as well as adequate preventive mechanisms and evacuation techniques were observed. This is a significant concern area given the congested setting of the workplace. None of the units have attended any formal fire safety or prevention training. Most of the units are not aware of regulatory requirements for obtaining a fire NOC.
4	Ergonomics and other risks due to current working practice	No severe ergonomics risk to workers is observed from these type of units.

xlvii. The Central Pollution Control Board 'Classification of Industries' lists the applicability of the 'Consent to Operate' for the different processes for the food processing sector basis the environmental pollution caused by them. It was observed that Food and food processing including fruits and vegetable processing unit falls under Orange category and any such unit qualify for obtaining Consent to Operate from respective state pollution control board since no specification on quantum of product manufactured, volume of waste generated etc. has been stipulated as such.

It was observed that none of the visited units operating in fruit and vegetable processing sector have a valid consent to operate from state Pollution Control Board.

3.2.3. Grains and oilseeds based processed products

xlviii. India is the second largest producer of food grains globally, producing more than 200 mn ton of different food grains every year. Total food grains production reached 270.10 MT in FY16 (Source: Annual report by Ministry of Agriculture). The important cereals which are cultivated are - wheat, paddy, sorghum, millet (Bajra), barley and maize etc. About 15 per cent of the annual production of wheat is converted into wheat products.

xlix. India, with its strongly growing flour demand, also has a very fragmented milling industry and almost two third of the flour is produced in small stone mills or chakki. The roughly 700 organized larger stone mills produce another 10 to 15 percent of the flour. The number of roller flour mills with a capacity of at least 100 tonnes per day has grown and is estimated at about 1100, producing about one fourth of the Indian flour.

l. India is the largest producer of oilseeds in the world but domestic production of edible oils has not kept pace with the rising demand for edible oils in the country, leading to a substantial increase in the imports of edible oils over time. The demand for edible vegetable oils & fats in India has shown a compounded growth of 4.5% over the last 10 years and is estimated at 21 million tonnes for Oil Year (OY) 2016-17. India plays an important role in the global edible oil market, accounting for approx.
10.2% share of consumption; 7% share of oilseed production; 5% share of edible oil production and 16% share of world edible oil imports for OY 2015-16. As per USDA estimates, India is the third largest consumer of edible vegetable oils & fats (after China and the EU-27 countries); and will account for 11% of global edible oil demand and 16% of global imports.

li. Within Indian Oil Seed Market by segments, vegetable oil production and consumption is highest. They are obtained from crushing local oilseeds, mustard in northern and eastern India; groundnut in Gujarat, Maharashtra, Karnataka and Andhra Pradesh; sesame and groundnut in Tamil Nadu; and coconut in Kerala. (Source: Indian oil seed market report by Indian Council of Food And Agriculture,
2015)

3.2.3.1. Spread of micro units across India (FSSAI data)

lii. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 25 – Spread of Micro units across India for Grains & Oilseed processing as per the FSSAI list

S No	Particular	India		
		Central	State	Registration
1	Processors	574	15665	675
2	Retailers	8	17	0
3	Transporters	2	10	0
4	*Total*	*584*	*15692*	*675*

3.2.3.2. Understanding the value chain and key processes

liii. Key aspects of Grains and oilseeds processing industries is described below:

Table 26 – Key aspects of the Grains & Oilseeds industry in India

S No	Understanding the grains and oilseeds supply chain models in India

1	• Approximately 90 percent of grains undergo primary processing, with wheat being the primary processed grain in India, largely used for wheat flour. Milling of rice and pulses makes up the remainder of the grain processing sector. Most grain processing is carried out in the unorganized or informal sector; however, some large players are active in the market and sell processed grains in branded retail packs. • The major actors in the rice and wheat value chains farmers/producers; a large number of intermediaries (including collectors, traders, commission agents, and brokers); wholesalers; processors (including rice and flour millers); and retailers. (FAO –Value chain of rice and wheat in Uttar Pradesh)
2	• Majority of farmers producing wheat and oilseeds have small land holding. Farmers store and sell their marketable surplus after each cropping season. • This is followed by a spectrum of aggregators includes small collectors and larger traders dealing in quantities from 10kg to minimum shipments of 10 tons. Initial contact with farmers is made at the market, where a farmer brings a sample of product, or at the farm gate, where a collector travels to arrange a sale before harvest, based on existing community relationships. • The processors which include only rice/ flour mill or combined mills including oil extraction process, purchase the raw material from the most efficient (availability and cost effectiveness) market source which is present in their vicinity.
	The grains are processed, sold loose or packaged with / without labelling, mainly to cater to the domestic consumption demand.

liv. Key activities and process involved in processing of grains and oilseeds is described below:

Table 27 – Key activites and process invovled in the Grains & Oilseeds processing industry

Key process steps involved in production	Grains are received and stored in a dry, pest free area. The production quantity is run through separator machines to filter out physical contaminations. The cleaned product is then passed through a milling machine to produce flour of desired quantity. For oilseeds, post cleaning and separation of physical contaminants, extraction machines are used for pressing of oil seeds mechanically/ with use of solvent to Extract Oil. Extracted oil is then further refined by Degumming, Neutralization, Bleaching and Deodorization of Crude Oil, which is then filled into containers/ packets and sealed. For post-production of rice milling is a crucial step. The basic objective of a rice milling system is to remove the husk and the bran layers, and produce an edible, white rice kernel that is sufficiently milled and free of impurities. Depending on the requirements of the customer, the rice should have a minimum number of broken kernels. A rice milling system can be a simple one or two step process, or a multi stage process: ○ One step milling - husk and bran removal are done in one pass ○ Two step process - removing husk and removing bran are done separately ○ Multistage milling - can be done in the village or local consumption or commercially for marketing rice; rice undergoes a number of different processing steps, such as: ▪ Pre-cleaning ▪ Dehusking or dehulling ▪ Paddy separation ▪ Whitening or polishing ▪ Grading and separation of white rice ▪ Mixing ▪ Mist polishing ▪ Weighing of rice

lv. Key environmental concerns of rice, grains and oilseed product processing units occur within the cultivation stage. However, processing also involves certain aspects which are described below

Table 28 – Key Environmental concenrs in the Grains & Oilseeds processing industry

Key environmental issues in a rice mill	Water utilized for soaking paddy, especially for parboiled rice production can result in water pollution and odor nuisance to local community In rice milling unit wastewater is usually generated in the parboiling stages from the soaking operation, and boiler blow down. Effluent produced during cleaning of equipment can cause water pollution through insufficient treatment of effluent Air pollution both on site and in the surrounding locality may result from release of dust to the atmosphere from handling or processing of the paddy or its by-products Generation of solid wastes, particularly unused rice husk and bran, as well as other wastes generated from the cleaning process Raw materials and by-products may be subject to pest infestation and contamination (Birds contaminated with avian flu can leave their droppings in the

	rice mill) Pollution risks to water and soil from spillage and leakage of fuels that maybe stored on site.
Key concern for Flour and oil mill	Generation of solid wastes in large quantities which needs to be handled efficiently. Most of the waste has a high dry organic content and has a potential to be used as a fuel / animal feed. The main pollutant of concern in grain milling industrial units is the particulate matter emission generated from material handling, cleaning, milling and packing operations. One of the key impacts of workers employed in rice or flour mills, is reduced lung efficiency of flour mill workers due to excessive exposure to fine organic dust prevalent in the workplace environment. The impairment in lung efficiency was increased with duration of exposure in the flour mill workers.

3.2.3.3. Performance of surveyed grains and oilseeds products processing units

lvi. The basic raw material in the grains and oil seeds industry is food grains like wheat, rice (paddy), jowar, bajra, pulses, soya bean, etc. and oilseeds like mustard, sesame, etc. The raw material for spices are turmeric, chili, garlic, onions etc. These food grains and raw material for spices are processed at the processing or milling units to manufacture flour, Besan, Oil, Rice, Soya Milk/Tofu, spices etc. lvii. In India, value chain of grains and oilseeds, spices start with farmers. These farmers can be large, medium, small or marginalized land holders. They sell their produce either to the middlemen (traders and government agencies) or in mandi. The processors operating in grains – oilseeds, spice sector procure their raw materials from these middlemen or buy from mandi. After processing, the processed product is then either sold directly to consumers through processor's retail outlet, or to middlemen (retailers, traders and government agencies). From these middlemen, the products reach the end consumer (either local households or nearby restaurants and hotels).[2]

lviii. The value chain for grains and oilseeds processing industry can be described below:

Figure 5: Value chain of Grains and oilseed including spices covered as a part of the assessment

Cultivation of Food Grains & oil seeds	Procurement of Food Grains and oil seeds	Processing	Marketing & Retailing
Small, medium, large farmers	• Traders (Distributers/Retail outlet) • Farmers		• Directly to customers through retail outlet • Local hotels and restaurants • Local retailers/traders

Components	Grinding operations (Flour, Besan, Spices)	De-husking of Rice	Oil Extraction	Soya products – Tofu/Soya Milk
Inputs	Raw Materials- Bajra, Jowar, Wheat, Pulses, Mustard, Maize	Raw MaterialPaddy	Raw Material- Mustard, groundnut, coconut, sesame and other oil seeds	Raw Material-Soya Bean, Water, Sugar, Additives- Salt, Spices,

[2] India's national food security programme: a strategic insight, by Maheswar Singha Mahapatra and Biswajit Mahanty;
Value Chain Analysis Of Wheat and Rice In Uttar Pradesh, India, by Stephen McCarthy, Deo Datt Singh, and Hannah Schiff of ACDI/VOCA for World Vision;
Supply Chain Management Of Rice In India: A Rice Processing Company's Perspective, by Vishal Sharma , Dr. Sunil Giri and Siddharth Shankar Rai

	Electricity	Electricity	Electricity	acetic acid Electricity Boiler Fuel wood
Process	Dry cleaning Dehusking Screening Grinding Packing	Dry cleaning Dehusking Screening Packing	Dry cleaning Screening Grinding Packing	Cleaning Steeping Extraction of milk Boiling and cooling of soya milk Addition of acetic acid Segregation of coagulated milk (solid material) Pressing to make tofu brick Packing
Equipment	Flour mill Oil extractor Spice grinder	Mini rice mill Balance Packing and sealing machine	Oil extractor Filter (in some cases)	Boiler (fuel Wood used), Milk extractor Cooker Hydraulic press Packing machine Containers
Output	Flour, Rice, Mustard Oil Dust Packing material Organic waste	Dust Packing material Organic waste	Oil Organic waste Dust Packing material	Soya milk/ Tofu Organic waste Waste water Packing material

lix. Key resource requirement of these units is described below:

Table 29 – Requirements and General features for the Grains & Oilseeds processing industry

Parameters	Observation

Land requirement	The covered area requirements varies as described below: • Units with area 100 m^2 and under Approximately 55% of the units spread across states for milling, spices and soya products • Units with area more than 100 m^2 but under 500 m^2 Approximately 40% of the units spread across states for milling, spices and soya products • Units with area more than 500 m^2 Approximately 5% units spread across states for milling The average unit size can be considered around 160m^2.
Water requirement	***Process water requirement***
Parameters	Observation
	○ Milling / grinding for flour production or extraction of oil from oilseeds do not require water for any interim process. The seeds are not required to be soaked in water or washed, they are dry cleaned and processed further. The final output is in a powder or liquid (oil) form, which is packaged and sold as such. ○ Similarly for Spice grinding little or no water is required for the operations. ○ For manufacture of soya milk or tofu, process water requirement can be estimated as 3 KL water is required for 1 ton of raw material • ***Cleaning and domestic water requirement:*** ○ Most of the grinding including spices and oil extraction units do not require water for cleaning and washing purpose. ○ The maximum requirement for such units is 1 KLD per month depending upon the magnitude of the operations. • ***Source of drinking water:*** ○ The most common sources water are groundwater and water supplied from municipal sources (equal proportion of both the cases are observed). ○ None of the units utilise any treated water for drinking purpose or process ○ Only the units engaged in soya bean processing were found to have basic filtration process to generate drinking and process water.
Power sources	• Majority of the grinding machines are electrically operated. • 10 units were found using Diesel powered generator sets for back-up power. Out of these 10 units – 5 were milling units, 3 were soya product units and 2 were for Spices. • Backup power is essential for tofu and soya milk manufacturing units to maintain the chiller/ freezer operation. For other units, Diesel Genset is required on local power availability.
Manpower requirement	The average manpower employed at the unit covered under the assessment were: ○ Milling units: 0 – 9 workers ○ Soya products units: 3 – 5 workers ○ Spices units: 1 – 11 workers

lx. Following is a list of key regulatory permits which are essential for such units:

Table 30 – Key Regulatory Permits required for the Grains & Oilseeds processing industry

S No	Regulatory requirements	Applicable (Yes/No)
1	Consent from Pollution Control Board	Applicable
2	Factories license	Applicable , in case of 10 or more workers or 20 in case of Maharashtra
3	Shops & Establishment Registration	Applicable
4	FSSAI License/Registration	Applicable

3.2.3.4. EHS performance of surveyed Grains and oilseed processing units

lxi. A summary of key environmental issues associated with the operations of the Grains and oilseed processing units (small holder and micro units) and their management as observed during field visits, is described in below table.

Table 31 – Key Environmental and Occupational Health & Safety issues observed for the Grains & Oilseeds processing industry

S No	Environmental Concerns	Observations from field survey
1	Dust generation and its management	• Dust arises from storage, handling, drying and milling activities. Milling operation, screening (sieving), grinding, and material handling are the key sources of dust generation in grain milling units. • The generation of fugitive dust is localized in nature and is produced as long as milling is undertaken. Dust production has an impact on the indoor air quality of the unit. None of the workers were found using nose cover or dust mask as a preventive measure. • Most of the milling units were found using a manual dust collection bag attached to the milling machine. However, the presence of this bag does not limit the spread of flour dust within the working area. Only one milling unit (Moga, Punjab) was found using vacuum based dust suppression and cleaning system. • Dust generation does not occur in Oil extraction or Tofu/ Soya Milk based units. • Low level of spice dust may be generated during handling of dry spice products
2	Air and noise emission and its management	• There is no source of air emission as part of the process in milling units or oil extraction units. • Boilers were found to be used in tofu / soya milk processing units for generation of heat. These boilers were found operating using Fuel Wood. In Punjab 2 units out of 3, it was observed that boilers were equipped with scrubbers (as indicated by the owners) leading to mitigation of emission. However, there is no periodic maintenance schedule to clean or ensure effectiveness of these emission mitigation devices. • In all the industries which have DG set to provide backup power, it is observed that the stack height is at very low level. • No emission testing is undertaken for the DG Set or for the boiler stacks. • High levels of ambient noise (upward of 70 db) is generated due to Milling, pump operation in all of the units. Long-term exposure to noise generated from various milling operation may induce hearing loss of the workers. None of the workers were found wearing any ear plug or noise prevention device.

3	Generation of wastewater and its management	• None of the milling and oil extraction units generate any process / cleaning wastewater. The Grain /Oil processing/spice manufacturing units mostly follows dry processe**s (**processes like screening, removal of dust/foreign particles, grinding, Oil extraction collection, packaging are dry in nature). Hence, no generation of waste water from process is observed from such units. • Soya processing units generate significant waste water from cleaning of utensils, washing of workspace as well as decanted water produced post soya processing. Wastewater collection was observed in only in one of the three soya processing units, in the remaining units it is directly discharged in municipal drains. Domestic sewage is also generated which is discharged in sewage drain network.
4	Solid waste generation and management	• Common solid waste generated from grain and oil processing units are dry husk (from milling of rice, wheat, grains etc.). Oil cake is generated from oil extraction process. These waste are organic in nature and are further disposed to local cattle farmers to produce cattle feed. • Inorganic solid waste includes dust and packing material (Jute/propylene Gunny sacks, etc.). The dust is disposed in nearby open areas. The packing materials like gunny bags are recycled to the extent feasible. • Used oil is generated from DG sets which is hazardous in nature. The quantity of used oil generated from the DG Sets is very nominal and is usually collected by DG set service agency at the time of annual servicing.
S No	Occupational health and safety concerns	Description

1	Physical Hazards	• Potential risk of accident from moving parts like conveyors, mills, grinders, presses (soya processing units) and packaging machinery. In all of the units, the moving machine parts operate without any machine guard. • Risk of electric shock due to non-grounding/ weak connections of all electrical equipment and installations. There is no schedule of preventive maintenance of insulation level for electrical wires and connections. At least 5 units (spread across different states) were observed where loose electrical connections were present. • Around 19% of milling and oil extraction units have a congested workspace wherein machines and storage material obstructs walkways and pathways. Also, around few of the units spread across states did not have machine placement close to electrical outlets. This resulted in loose hanging wires causing obstruction in the pathway. This leads to a risk of trip and fall and also prevent ease of evacuation during emergency. • Specifically in the soya processing units, accidental spillage of hot soya milk (in Tofu/Soya milk manufacturing units only) can lead to burns. • Only 34% of the units (across all states) have a first aid kit or common first aid equipment like band aids, cotton, gauges, antiseptic and anti-burn screams. Remaining 66% did not have any provision for treatment of minor injuries.
2.	Chemical hazards	Since the process does not involve usage of any toxic chemicals, there is no risk of exposure to a chemical hazard. The units were observed using domestic cleaning chemicals which have low risk profile.
3	Fire Safety and emergency prevention	All of the units are operating in an enclosed area except 1 unit observed in Washim, which was found operating milling machine in an open enclosure.
		Majority of units did not have any fire prevention mechanism such as stored water or sand bucket etc. Lack of awareness on risk due to fire as well as adequate preventive mechanisms and evacuation techniques were observed. This is a significant concern area given the congested setting of the workplace. None of the units have attended any formal fire safety or prevention training. None of the units are aware of regulatory requirements for obtaining a fire NOC.

4	Ergonomics and other risks due to current working practice	It was observed in milling units in Maharashtra that in order to fulfil unexpected demand, the material procurement was undertaken in day time which was followed by overnight work. These uncontrolled excessive working hours lead to physical discomfort of female workers. The loading and unloading operations are undertaken manually without assistance of mechanical aids. There is no awareness regarding adequate ergonomics in terms of loading and unloading positions or adequate rest between operations.

lxii. The Central Pollution Control Board ‘Classification of Industries’ lists the applicability of the ‘Consent to Operate’ for the different processes for the food processing sector basis the environmental pollution caused by them. It was observed that in general Grains and Oilseed processing and spice manufacturing units fall under Green category. Only Parboiled Rice mills falls under Orange or Red Category based extent of on fuel consumption and waste water generation. No such category is defined by CPCB for Soya Milk/Tofu manufacturing units. The visited units mostly involved in process like Flour Milling (Dry process), Rice mills (Rice hullers) and Oil Extraction hence may be categorized as Green Category. Consent to Operate (CTO) is applicable for Green Category industries as well.

It was observed that only 3 of the visited units (all from Uttar Pradesh) operating in Grain - Oil processing, Spice Manufacturing sector had taken CTO from State Pollution Control Board. Only one unit in Punjab had taken CTO initially and not renewed after 2018.

3.2.4. Packaged food items such as Bakery, snacks, papad etc.

lxiii. One of the key segments in the traditional food market is Indian Traditional Snacks. The total snacks market is broadly categorized into three sub segments—chips, extruded snacks and traditional snacks; with each segment contributing equal in terms of total snacks market share. The industry is highly unorganized with 70% dominated by local players. The unorganized Namkeen market consists of homemade and loose salty snacks generally sold in small Kirana shops.

lxiv. The bakery sector comprises the largest segment of the food processing sector in India with more than 2,000 organized or semi-organized bakeries producing around 1.3 million tonnes of the bakery products and 1,000,000 unorganized small-scale bakeries producing 1.7 million tonnes. Bread and biscuits are the most popular bakery items and account for 80% of the total market. The bakery industry has achieved third position in generating revenue in the processed food sector (Source FSSAI FSMS guideline for Bakery products)

lxv. The percentage share of the organized/registered food processors are hardly 1.5 percent of the total food processors. About 66% of unorganized food processing units are in rural areas and of these, 80% were family run. Packaged food items industry is mainly catered by small, micro and other home based setups. There is no precise information on exact market size and volume produced or traded for items under packaged and prepared food sector.

3.2.4.1. Spread of micro units across India (FSSAI data)

lxvi. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 32: Spread of Micro units across India for Packaged food items as per the FSSAI list

S No	Particular	India		
		Central	State	Registration
1	Bakery	1732	24957	13153
2	Ready to eat snacks	1166	14540	13029
3	Retailers	45	582	13
4	Transporters	0	7	1
5	*Total*	*2943*	*40086*	*26196*

lxvii. Out of the above, the following packaged food manufacturing units have been covered as part of the primary field survey in shortlisted districts:

Table 33 – Coverage of enterprises for Packaged food items across different districts of the selected states for the assessment

Type of Units	Punjab		Uttar Pradesh		Maharashtra		Andhra Pradesh	
Districts	Sangrur	Moga	Aligarh	Fatehpur	Nashik	Washim	Vizianagaram	Prakasam
Total	7	7	5	4	2	11	10	7
Bakery	4	6	4	4	0	3	1	0
Snacks	3	1	1	0	0	2	5	7
Papad	0	0	0	0	2	6	4	0

3.2.4.2. Understanding the value chain and key processes

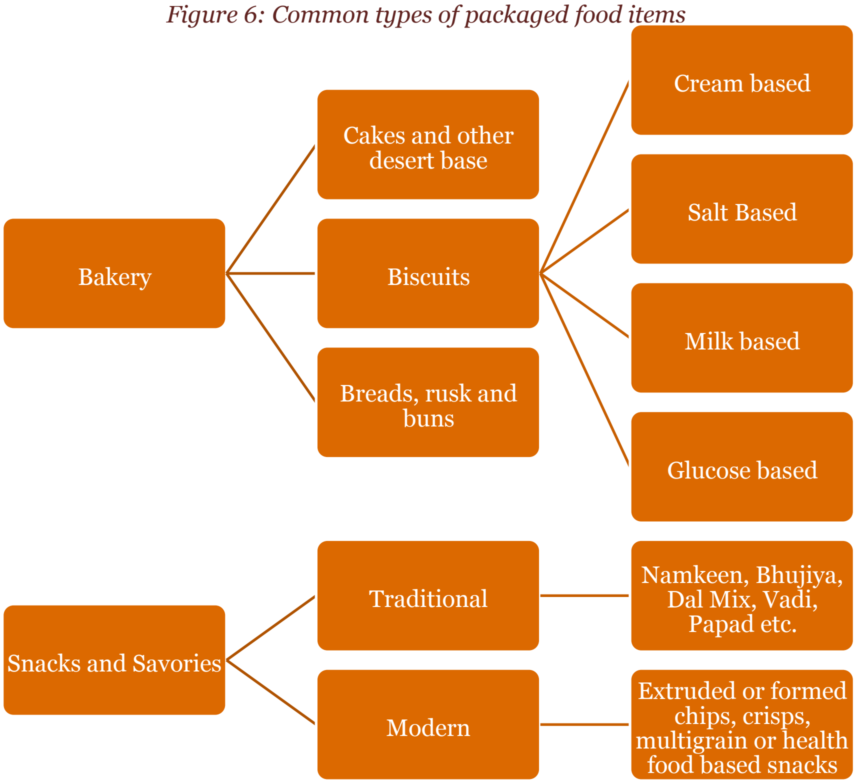
lxviii. Key aspects of the value chain for packaged food items is described below:

Table 34 – Key aspects of the Packaged food items industry in India

S No	Understanding the supply chain models for Bakery and Packaged foods like Snacks & Savories
1	• The value chain for packaged foods is dependent on other food industries as well. • The raw material required for packaged food industry consists of : ○ Eggs or Ready-to-eat products containing lightly-cooked or uncooked eggs (e.g. butter, cream, icing, mayonnaise, mousse, condensed milk) ○ Dry ingredients like wheat flour, sugar, milk powders, minor ingredients and cocoa powder ○ Wet ingredients like oils and fats ○ Specialty Ingredients like nuts and dry fruits ○ Fresh, whole, processed and semi-processed fruits and vegetables ○ Salt, sugar and spices • The major differentiator in organized vs unorganized industry in this segment is procurement of raw material. • Wherein organized sector have established a dedicated value chain for procurement and quality testing of raw material and packaging products, the unorganized sector is dependent on availability and prices that are offered in the local domestic market by individual traders or other unorganized industries. • The sector has considerable growth potential and few of the segments like bakery, snacks, savories, breakfast cereals and organic snacks have been identified as high growth segments.

lxix. Key products in this segment are depicted in below figure:

Figure 6: Common types of packaged food items



lxx. Key process involved in processing are described below

Table 35 – Key processes involved in the Packaged food items industry in India

S No	Key processes
1	Key processes involved in bakery (cakes, biscuits, buns, bread etc.) are: ○ Material preparation which involves sieve all incoming ingredients, intermediates and add backs (if any) through appropriate standard mesh. ○ Premixing involves mixing eggs and other base material. ○ This is followed by forming and addition of flavors, nuts, dried fruits etc. ○ Baking at desired temperature followed by cooling and setting ○ Slicing and packaging
2	Key processes involved in preparation of snacks and savories are: ○ For fried items, dough and condiments are mixed by hand and desired pieces are cut through machines. These are then air dried or sun dried before packaging ○ For other items like namkeen etc., dough is prepared using desired ingredients and then fried at required temperature in food grade oil

lxxi. Key environmental concerns in preparation of packaged food items include:

Table 36 – General characterisitcs and requirements of the Packaged food items industry in India

S No	Key processes

1	Key environmental and waste related aspects for bakery industry (cakes, biscuits, buns, bread etc.) are: ○ Generation of Food waste, non-edible by product & other refuse ○ Generation of air emission specially ppm during baking and heating operations ○ Generation of packaging waste ○ Wastewater generation from cleaning of equipment and facility
2	Key processes involved in preparation of snacks and savories are: ○ Generation of Food waste, non-edible by product & other refuse ○ Generation of used and contaminated oil by product ○ Generation of packaging waste ○ Wastewater generation from cleaning of equipment and facility

3.2.4.3. Understanding the performance of packaged food items such as bakery, snacks and papad etc. processing units during field work

lxxii. The value chain for packaged food items such as bakery, snacks and papad etc. processing industry can be described as below:

Figure 7: Value chain of packaged food processing industry covered as a part of the assessment

Production and processing of Raw Material	Procurement of Raw Material	Processing	Marketing and Retailing
Small, medium, large farmers producing grains, pulses, oilseeds and vegetables	Local mandi, Local retail shops Departmental stores		Directly to consumers through own outlet Local retailers/Traders

▯ Small, medium, large grain processors manufacturing besan, flour, rice, oil etc.			

Components	Bakery and Confectionary	Snacks (Namkeen, Gajak)	Papad
Inputs	Raw Materials - Flour, Eggs, Sugar, Milk, Oil. Salt, Sugar, Ghee, Water Electricity Fuel (Diesel/Fuel wood)	Raw Materials - Rice, Ghee, Sugar, Salt, Oil, Flour Electricity	Raw Materials - Pulses, Spices
Process	Unpacking of raw material Mixing Kneading Shaping Baking Packing	Cleaning/Washing Peeling Mixing Cutting Grinding Frying	Mixing Rolling Drying Packing
Equipment	Mixer Dough maker Weighing machine Oven Cold storage (in case of pastries) Packing & Sealing machine	Slicer Mixer Fryer Packing and Sealing machine Weighing machine	Primarily manual operations Packing and Sealing machine Weighing machine
Output	Buns, Patties, Biscuits, Cake, Bread Organic and inorganic waste	Namkeen, Gajak, Rice coated sheets, Masala Peanuts Organic and inorganic solid waste	Papad Organic and inorganic waste

lxxiii. Resource requirements and general features of units engaged in processing of Packaged food processing unit is described below:

Table 37 – Requirement and General features of the Packaged food items industry

Parameters	Observation

Parameters	Observation
	manufacturing units ▯ Units with area more than 500 m^2 Approximately 4% units spread across states for bakery and snacks manufacturing units The average unit size can be considered around 150m^2.
Water requirement	• ***Process water requirement*** ○ No significant amount of water in used in the processes involved. Water is used for kneading & dough making in all the categories – Papad, Bakery and Snacks manufacturing • ***Cleaning and domestic water requirement:*** ○ Moderate water is being used for cleaning of the equipment and units for disinfection and hygiene requirements ○ The standard requirement for such units is between 0.50 KLD to 1 KLD per month depending upon the magnitude of the operations. • ***Source of drinking water:*** ○ The most common sources water are groundwater and water supplied from municipal sources out of which approximately 69% of the units are using municipal water for their water requirements. ○ None of the units utilise any treated water for drinking purpose
Power sources	• All the units covered receive the electricity from the main GRID. 15% of the units also had Diesel powered generator sets for back-up power. • 8 units were found to be using Diesel powered generator sets for back-up power. Out of these 8 units – 6 are bakery and 2 are snacks manufacturer.
Manpower requirement	▯ The average manpower employed at the unit covered under the assessment were: ○ Bakery: 1 – 25 workers ○ Snacks manufacturer: 1 – 17 workers ○ Papad manufacturer: 1 – 15 workers
Land requirement	The covered area requirements varies as described below: • Units with area 100 m^2 and under Approximately 73% of the units spread across states for bakery, papad units and snacks manufacturing units • Units with area more than 100 m^2 but under 500 m^2 Approximately 22% of the units spread across states for bakery and snacks

lxxiv. Following is a list of key regulatory permits which are essential for such units:

Table 38 – Key Regulatory Permits required for the Packaged food items industry in India

S No	Regulatory requirements	Applicable (Yes/No)
1	Consent from Pollution Control Board	Applicable
2	Factories license	Applicable, in case of 10 or more workers or 20 in case of Maharashtra
3	Shops & Establishment Registration	Applicable
4	FSSAI License/Registration	Applicable

3.2.4.4. EHS performance of Surveyed Packaged Food Manufacturing units

lxxv. A summary of key environmental issues associated with the operations of the Packaged Food and Spice Manufacturing units (small holder and micro units) and their management as observed during field visits, is described in below table.

Table 39 – Key Environmental and Occupational Health & Safety issues observed for the Packaged food items industry

S No	Environmental Concerns	Observations from Field
1	Dust generation and its management	Although no such significant dust generating process is observed in packaged food processing units. Low scale of dust (from raw material like flour) is generated from material handing or from the processes like kneading and mixing (mixing of spice in case of snacks manufacturing units). Usually exposure to such type of dust is mitigated by covering nose and mouth with piece of cloth
2	Air and noise emission and its management	The major air emissions of concern from bakery unit are volatile organic compounds (VOCs). The primary VOC emitted from bakery operations is ethanol. It is produced by yeast metabolism during fermentation and is emitted in large amounts when the dough is exposed to elevated temperatures in the oven[2]. None of the units were equipped with any emission control device. During the process of baking (in oven operated by Diesel and Electricity or fuel wood) air emission is observed. Emission may contain NOx, PM, HC, CO_2, CO_2. Snacks manufacturing units generates fumes during the frying process. Which may contain suspended water & oil droplet mix. Although exhaust fans were installed in all the units, it was observed that the exhaust fans were not adequate enough to clear the emission/fumes from the working/processing area and workers were getting exposed to such unhealthy condition for quite a long period during working hours. None of the workers were provided with mask as preventive measure from inhalation of emissions/fumes.
3	Generation of wastewater and its management	Packaged food manufacturing units require water for manufacturing process as well as cleaning. The water is absorbed in the process of manufacturing and no waste is generated. The waste water is generated from the process of cleaning working space, washing of utensils. The effluents generated from floor washing, cleanings of utensils etc. may contain high Biochemical oxygen demand, Total Suspended Solid (TSS), Oil & Grease. All the units directly discharge waste water in municipal drainage system.

[2] https://www3.epa.gov/ttn/chief/old/efdocs/bakeries_apr1992.pdf

		Domestic sewage is also generated which is discharged in sewage drain network.
4	Solid waste generation and management	Common solid waste generated from packaged food manufacturing units are inorganic waste like packaging waste and organic waste like egg shells, vegetable peels, food waste etc. The waste oil is generated from snacks manufacturing units during the process of frying. The waste oil is sold to soap manufacturing units. Used oil is generated from DG sets which is hazardous in nature. The quantity of used oil generated from the DG Sets is very nominal and is usually collected by DG set service agency at the time of annual servicing.
S No	Occupational and Food Safety concerns	Observations from Field
1	Physical Hazards	• Workers of bakery units may be exposed to high temperatures near ovens and have to handle hot product. This could lead to collapse through heat exhaustion and contact burns. • In snacks manufacturing units there is a risk of burning due to accidental spillage of hot oil, handling of hot semi- finished product. None of the workers engaged in process of frying were provided with heat resistant gloves, shoes or aprons • Risk of electric shock due to non-grounding/ weak connections of all electrical equipment and installations. There is no schedule of preventive maintenance of insulation level for electrical wires and connections. • Around 36% of units have a congested workspace wherein machines and storage material obstructs walkways and pathways. • Also, around 20% of units (spread across states) did not had adequate lighting may lead to a risk of trip and fall and also prevent ease of evacuation during emergency. • About 33% of the units (across all states) have a first aid kit or common first aid equipment like band aids, cotton, gauges, antiseptic and anti-burn creams. Remaining 67 % did not have any provision for treatment of minor injuries.
2	Chemical hazards	Since the process does not involve usage of any toxic chemicals, there is no risk of exposure to a chemical hazard. The units were observed using domestic cleaning chemicals which have low risk profile.

3	Fire Safety and emergency prevention	• Majority of units did not have any fire prevention mechanism such as stored water or sand bucket etc. • Lack of awareness on risk due to fire as well as adequate preventive mechanisms and evacuation techniques were observed. This is a significant concern area given the congested setting of the workplace. • None of the units have attended any formal fire safety or prevention training. • None of the units are aware of regulatory requirements for obtaining a fire NOC.
4	Ergonomics and other risks due to current working practice	No such severe ergonomics risk to workers is observed from packaged food processing industries. However, repetitive work and posture injuries may occur may occur during the process of continuous frying (in case of snacks preparation), shaping/dicing, packing etc.

lxxvi. The Central Pollution Control Board 'Classification of Industries' lists the applicability of the 'Consent to Operate' for the different processes for the food processing sector basis the environmental pollution caused by them. It was observed that packaged food processing units falls under Orange or Green category and any such unit qualify for obtaining Consent to Operate from respective state pollution control board.

It was observed that only 1 unit in Punjab and 2 units in Uttar Pradesh have obtained a Consent to Operate (CTO) from respective state pollution control board.

3.2.4.5. Safety, Hygiene and Food Safety concerns across surveyed units

Table 40 – Coverage across categories for the assessed enterprises

Grains & Oilseeds (60)	Dairy products (27)	Fruits & Vegetables (20)	Packaged food (43)
Coverage of units per State: 1. Punjab - 26 2. Uttar Pradesh - 16 3. Maharashtra - 16 4. Andhra Pradesh - 2	**Coverage of units per State:** 1. Punjab - 10 2. Uttar Pradesh - 9 3. Maharashtra - 7 4. Andhra Pradesh - 1	**Coverage of units per State:** 1. Punjab - 6 2. Uttar Pradesh - 8 3. Maharashtra - 3 4. Andhra Pradesh - 3	**Coverage of units per State:** 1. Punjab - 14 2. Uttar Pradesh - 8 3. Maharashtra - 7 4. Andhra Pradesh - 14

Table 41 – Key Safety, Hygiene and Food safety concerns for the assessed enterprises

S No	Parameter		Grains & Oilseeds	Dairy products	Fruits & Vegetables	Packaged food
1	Pest Control	Units without closed fitted doors to avoid entry of pests	77%	51%	81%	72%
		Units without closed fitted windows to avoid entry of pests	65%	62%	70%	76%
		Units without Pest control equipment or management plan	100%	100%	100%	100%
		Units who do not hire an External pest control agency for schedules fumigation/pest control	100%	100%	100%	100%
2	Personal Hygiene	Staff who do not maintain personal cleanliness	31%	48%	55%	48%
		Units where staff do not have access to different toilets for male and females	53%	77%	65%	67%
		Units where staff were not found to be wearing any apron, headgear, gloves etc.	98%	100%	100%	97%
		Units where food handlers did not undertake a medical examination	100%	100%	100%	100%
3	Cleanliness of the facility	Units with instances of wall flaking	15%	15%	6%	44%
		Units where cleanliness is not being maintained	18%	16%	10%	64%
		Units where there is no system of prevention of contamination to a satisfactory degree	100%	100%	100%	100%
4	Lighting and ventilation	Units with inadequate lighting conditions	16%	3%	0%	25%
		Units with inadequate ventilation	8%	3%	0%	25%
5	Testing	Units where testing of Raw material is not being undertaken	28%	14%	40%	23%
		Units where testing of finished product is not being undertaken	15%	18%	38%	23%
		Units where testing of potability of water is not undertaken	100%	100%	100%	100%

3.2.4.6. A note on baseline energy and waste generation characteristics of shortlisted units

lxxvii. The environmental baseline assessment which has been undertaken through the survey of shortlisted Food processing units in 4 states has also sought to assess the baseline energy and water foot print and quantum of waste generation by the units.

lxxviii. The units in these sectors vary in scale and size of operations, and also in terms of single products or multiple product generation. Also, many of such units are seasonal and do not operate across the year.

lxxix. 90% of these units in unorganized sector do not possess the following: ○ Maintenance of records of energy utilization or previous months electricity bills ○ Do not have water meter installed to measure or record consumption of municipal water ○ Do not record consumption of ground water ○ Do not segregate, store or record the weight of various kinds of waste generation.

lxxx. In light of the above limitation, a baseline environmental profile for energy utilization, waste generation and water utilization cannot be developed as part of EIA.

lxxxi. However it is recommended that in the design phase of IFPVAP program to commence a detailed baseline assessment of Water, Energy and Waste foot print of such units and map this to production of final products as well as utilization of raw material.

lxxxii. Such an assessment needs to be conducted prior to establishing the KPI's for the program, and the baseline data needs to be periodically assessed to measure progress and improvements in terms of reduction of resource utilization and waste generation.

3.3. Stakeholder consultations

3.3.1. State level consultations

lxxxiii. The section below discusses the summary of the Institution consultation undertaken by the team for the proposed Gram Samridhi Yojana. As a part of the assessment the following districts for the selected States of Punjab, Uttar Pradesh and Maharashtra were covered:

Table 42: List of selected districts for the Environmental assessment

State	Punjab	Uttar Pradesh	Maharashtra
Districts for Environmental assessment	Sangrur	Aligarh	Nashik
	Moga	Fatehpur	Washim

lxxxiv. The following key institutional stakeholders were selected for consultation for the proposed Gram Samridhi Yojana.

- Nodal agency of the Ministry of Food Processing Industry for each of the selected states
- Food Safety and Standards Authority of India (FSSAI)
- Pollution Control Board (PCB)
- District Industries Centre (DIC)
- National Rural Livelihoods Mission (NRLM) and similar departments
- Other stakeholder (Dept. of forest and wildlife, Dept. of animal husbandry)

3.3.1.1. Nodal agency of the Ministry of Food Processing Industry

For each state, nodal agency has been selected who will implement the scheme

3.3.1.1.1. Discussion points

Consultation with district official nominated under IFPVAP

- The Nodal agency was aware about the IFPVAP scheme, however the roles and responsibilities are yet to be planned and finalized.

- Majorly the Food Processing Enterprises in informal sector (micro enterprises) are dominated by spice processing, Pickles, Bakery and Dairy industry and other small level prepared foods like Papad, badi etc.

- Meat processing and poultry industry is predominantly found either at small enterprise level, in some states like UP they are more or less organized since unorganized setups are not allowed to operate slaughter house and process meat.

- One of the key challenges surfacing regarding Unorganized food processing sector deal with difficulties in selling their products, mainly because of low branding and advertisement opportunities.

- Unorganized Food Processing Enterprises are not adequately equipped to avail benefits of various government schemes.

- One of the key role and responsibility of the person at the district level office is providing training on food preservation and food processing, the category would vary from state to state.

- In the past, the nodal officers have had experience of providing assistance to many units in scaling up, applying for FSSAI license and also spreading awareness about applicable government schemes.

- The nodal officers do not have any technical expertise or background with regards to environmental challenges for challenges related to food safety.

- There is no dedicated E&S cell at the state or nodal level and less familiarity of working with various safeguard instruments such as those of World Bank or ADB.

Few pointers related to specific states /districts:
Lucknow/Fatehpur:

- The horticulture and food processing dept. has engaged Deendayal Upadhyaya State Institute of Rural Development to undertake a diagnostic study to map the existing food processing units in each districts in UP.

- The Department works closely with MSME department in assisting establishment of Food Processing units. Also, they have recently worked on Diversified Agricultural Support Project (DASP), funded by World Bank, to increase agricultural productivity, promote private sector development, and improve rural infrastructure.

- Inadequate number of workforce is one of the major challenge that their department is facing. Almost, 50% of the positions are vacant in the department at district and divisional level.

Maharashtra:
Below noted were some of the challenges faced by the food processing units:

- High taxes on machines is acting as a deterrent for starting an enterprise.

- Difficult to get formal finance due to lack of collateral.

- Lack of technology upgradation, most of the units are using old machines.

- Lack of market linkages for small enterprises.

3.3.1.2. Food Safety and Standards Authority of India (FSSAI)

FSSAI is an institution created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. At the state level, the institute is headed by State Food Safety Authority with the Commissioner of Food Safety reporting to him/her followed by Food Analyst and Designated Officers. The Food Safety Officer reports to the Designated Officers.

The institute has 1 NABL Accredited State Lab in SAS Nagar in Punjab, No State Lab in Andhra Pradesh, 2 NABL Accredited State Lab in Maharashtra and No NABL Accredited State Lab in Uttar Pradesh (current source of this information is obtained through FSSAI website and can be cross verified) Some other details for these states is listed below:

Table 43 – Status of the designated officers, food safety officers, food analyst and state labs in the states of the assessment

S No	State	Designated Officers	Food Safety Officers	Food Analyst	State Labs	NABL Accredited Labs
1	Punjab	Full Time: 22 Part Time: 22	Full Time: 30 Part Time: 30	1	1	1
2	Andhra Pradesh	Full Time: 14	Full Time: 32	3	-	-
3	Maharashtra	62	FDA: 265 Local Bodies: 27	13	18	2
4	Uttar Pradesh	72	Full Time: 604	16	5	-

3.3.1.2.1. Discussion points

Consultation with district officials

- As per ground information, major food processing enterprises in unorganized food processing sector are likely to be of Fruits & Vegetables Processing, Bakery, Dairy based, Flour Milling categories.
- FSSAI has developed its outreach, they have set up online registration process for applying for FSSAI and they have setup community centers where people can get assistance to filling forms.
- The department runs awareness programs as well to make people aware of FSSAI requirement and bring most of them under FSSAI registration, but focus is less on informal sector.
- As per the consultation, it was discussed that the concern regarding hygiene and food safety would be biggest challenge if such program (IFPVAP) is implemented to scale up the informal sector Food Processing Enterprises.
- The accessibility of testing labs is also a major hindrance. For example, there is no testing lab in Fatehpur which is a major challenge, because of which samples are sent to Gorakhpur or Lucknow for testing which delays the process. The department team informed that only few of the unorganized food processing units have taken FSSAI registration/license. Most of the units avoid taking license, until visited by them. Identifying and mapping units running without FSSAI registration/license is also a challenge.
- There is a lack of awareness among enterprises on the benefits which they can prevail after obtaining FSSAI registration/ license. They also conduct sessions to promote awareness on FSSAI registration/license and benefits.
- There is an acute shortage of licensing and enforcement officers (Designated Officers and Food Safety Officers) in the states severely affecting food safety measures in the states.
- The department does not have any database on the presence of unorganized food processing units in their respective districts. The only data they maintain is of the registered or license FSSAI units. Identifying and mapping units running without FSSAI registration/license is also a challenge.

3.3.1.3. Pollution Control Board (PCB)

The Central Pollution Control Board (CPCB), statutory organization, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981. CPCB is the central board which is supported by the 29 State Pollution Control Boards and 6 State Control Committees. The central board is the country's national pollution watchdog.

3.3.1.3.1. Discussion points

Consultation with district officials

- Major environmental concern associated with Food Processing Enterprises in unorganized sector relates to use of boiler (extent of pollutant depends on nature and quantum of fuel) and discharge of poorly treated effluent during direct discharge of waste water.

- Most of the units in the food processing sector falls under either white or green category. Consent to Operate is applicable for green category and not applicable for white category. It is the responsibility of owner of individual unit to apply for CTO and renew it.

- It is difficult to monitor and trace small Food Processing Enterprises and conduct an inspection from pollution prevention perspective.

- There is an acute shortage of manpower in the state for instance, in Punjab for a total job listing of 648 only 447 have been posted out of which 201 posts are still vacant.

- The department does not have any database on the presence of unorganized food processing units in their respective districts some of which might require a ‘Consent to Operate’.

3.3.1.4. District Industries Centre (DIC)

The District Industries Centers (DICs) program was started in 1978 with a view to providing integrated administrative framework at the district level for encouraging entrepreneurs in rural areas. The DIC is treated as a single window interacting agency at the district level which provides service and support to small entrepreneurs under a single roof at both pre and post investments. District Industries Centers (DICs) give full assistance to the entrepreneurs who are going to start the business on their own and in their regional places. DICs provide various schemes for promoting the growth of rural and cottage industries and also different (micro, small and macro) industrial enterprises.

3.3.1.4.1. Discussion points

Consultation with district officials

- Amongst the food categories being explored, rice mills mostly have factory license.

- Prevailing units in unorganized food processing sector are likely to be flour milling/grain processing, dairy based processing units, bakery, sweets, smaller prepared and packaged food items and fruits and vegetables ripening or processing units for pickle, jams etc.

- Mudra Loan, Credit Guarantee Fund Trust for Micro and small enterprises (CGTMSE) are the current schemes running for micro and small enterprises.

- Most of the small and micro units does not come under the preview of any regulation and hence such units are hardly monitored.

- The biggest challenge to promote IFPVAP would be its communication and awareness to the beneficiaries and also to analyze the willingness of the owners to convert from unorganized to organized units.

- Dedicated Environmental Cell was not there in any of the DIC offices visited across the 4 states.

3.3.1.5. National Rural Livelihoods Mission (NRLM) and similar departments

National Rural Livelihoods Mission (NRLM) was launched by the Ministry of Rural Development (MoRD), Government of India in June 2011 and is the implementing body for Deendayal Antyodaya Yojana (DAYNRLM).

NRLM target is to cover 7 Crore rural poor households, across 600 districts, 6000 blocks, 2.5 lakh Gram Panchayats and 6 lakh villages in the country through self-managed Self Help Groups (SHGs) and federated institutions and support them for livelihoods collectives in a period of 8-10 years.

The support structure, for the program are as noted below:

- National level – Empowered Committee (EC) & National Rural Livelihoods Promotional Society (NRLPs)
- State level – State Rural Livelihoods Missions (SRLMs) & State Mission Management Units (SMMUs)
- District level – District Mission Management Units (DMMUs)
- Block level – Block Mission Management Units (BMMUs)

Table 44 – Status of the NRLM State, Districts and Block teams

S No	State	State team	District team	Block team
1	Punjab	17	14	86
2	Andhra Pradesh	147	654	3672
3	Maharashtra	37	225	1953
4	Uttar Pradesh	36	359	1006

3.3.1.5.1. Discussion points

Consultation with district officials

- Agricultural Technology Management Agency (ATMA) assists small scale entrepreneurs of the sector by providing them training assistance, spaces for promoting and selling their products, sometime financial/ infrastructural assistance, by making people aware about latest policies towards upliftment of rural entrepreneurs etc.

- Major schemes for rural development in the target district are NRLM, PMSKY, Kaushal Vikas Yojna. However no schemes is being run especially for unorganized food processing sector.

- Major focus of these schemes is to train people for white collar jobs.

- Women entrepreneur are present in the region but because of various prevailing cultural issues.
- There are 5200 SHGs registered under Aligarh NRLM and out of them more than 1500 were from scheduled caste category.
- Nationalized banks are more than happy to support SHGs because of their high repayment rate (More than 95%).
- SHGs into food processing are facing challenge with respect to new business opportunities.
- Most of the SHG are not able to sustain themselves for long due to lack of product demand. For instance, In Fatehpur, SHGs were formed for spice processing but currently no work is been done by them. All the SHGs members are working on other work as there is no demand for the spices. The situation in Punjab is even worst, number of SHGs were formed but none are functional at the moment.
- Most of the SHGs members are uneducated, lack technical ability, skills which acts as a constraint to improve their efficiency.
- Prevalence of many exclusions (caste/religious/class groups) which intersect in complex ways creating barriers in creating comprehensive groups of members from different community.

3.3.1.6. Key Financial Institutions

3.3.1.6.1. Discussion points

Consultation with district officials

NABARD

- They are running a Dairy Entrepreneur Development Scheme which aims to provide assistance in setting up dairy farms however, the response received till date is limited.
- One of the key challenge which the unorganized food processing industry is facing is that the enterprises lacks the willingness to get organized because of the fear of increased regulations.

Financial Institutions (Aryavart Bank)

- Even for applying bank loan under government schemes, the unit needs to provide collateral or guarantor. Further, it is difficult to provide loans to home run units because of the viability of the project.
- Risk of NPA is high in the sector.

3.3.1.7. Training institutions

3.3.1.7.1. Discussion points

Consultation with the institutions

NIFTEM

- NIFTEM assists in setting up of food standards, business incubation and also knowledge sharing in the field of food processing and technology. The institute offers B.Tech, M. Tech & Ph.D in food technology, food safety and quality management, food processing etc.

- NIFTEM is located in Sonipat and has tie up with other institutes.

- They are currently working with KVK and also on the village adoption program, wherein they provide training to the entrepreneurs.

IIFPT

- IIFPT is a pioneer research and educational Institute under the Ministry of Food Processing Industries and is engaged in the R&D of food grain processing, value addition, by-product utilization through bio-processing, process and product development.

- It has six departments namely department of food engineering, department of food packaging and system development, department of food product development, department of Food biotechnology, department of primary, processing, storage and handling, and department of technology dissemination.

- The headquarters is located headquarters are located in Thanjavur, Tamil Nadu and has two liaison office at Guwahati and Bathinda. Currently, it offers B.Tech, M.Tech. & Ph.D. programs in Food Processing Engineering. Further, they have collaborations with many universities and corporates.

- In the past they have provided training to entrepreneurs and currently involved in projects such as setting up of livelihood business incubation centre at the district level.

- They are well equipped to develop the content and impart trainings for capacity building.

3.3.2. Outcome of National level consultation Workshop

A national level consultation was organized by the Ministry on 30th May 2019 at Shri Ram Hall, PHD House, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi. The agenda of the consultation was to invite comments/suggestions from various stakeholders on Draft Environmental Management Framework prepared for IFPVAP- Gram Samridhi Yojana.

3.3.2.1. Participating Ministries and Departments

A total of 12 Ministries and Departments attended the proceedings. A list of the participants are as following:

1. **Ministry of Food Processing Industries (MoFPI) Representatives**
   a. Dr. Rakesh Sarwal, Additional Secretary
   b. Mr. Rakesh Sharma, Deputy Secretary
   c. Mr. Gajendra Bhujabal, Senior Consultant

2. **FSSAI Representatives**
   a. Ms. Pritha Ghosh, Deputy Director
   b. Mr. Prabhat Kumar Mishra, Asst. Director

3. **Department of Food Processing, Punjab**
   a. Mr. Rajmukh Singh, Sr. Assistant
   b. Ms. Manjit Kaur, Research Fellow

4. **Ministry of Rural Development Representative**
    a. Mr. H.R. Meena, DS (RL)

5. **NABARD Representative**
    a. Ms. Bonani Roychoudhury, AGM

6. **Ministry of Woman and Child Development Representative**
    a. Dr. J. H. Panwal, Joint Technical Advisor

7. **Ministry of Labour & Empowerment Representative**
    a. Dr. S. Gunahari, Regional Labour Commissioner (C)

8. **TRIFED Representative**
    a. Mr. Surinder Sharma, Dy. General Manager

9. **Ministry of Tribal Affairs**
    a. Mr. Nadeem Ahmad, Under Secretary
    b. K. Chandra Sekar, Under Secretary

10. **Horticulture and Food Processing Department, Uttar Pradesh**
    a. Vijay Bahadur Yadav, Dy. Director

11. **ICAR Representative**
    a. Dr. S. N. Jha, Asst. Director General
    b. Ms. Anamika Thakur, Scientist

12. **PHD Chamber Representative**
    a. Mr. J. N. Singh, Consultant
    b. Ms. Mallika Verma

3.3.2.1.1. Key discussion points

Consultation with the Ministries/Department

FSSAI

- FSSAI stated that they are under process of developing sector specific FSMS management plan (guideline) which will differentiate the requirements based size of units i.e. small and micro scale food processing units. Once it is developed it will be shared with all the stakeholders. At present, under schedule 4 of FSSAI registration there is provision for small / micro scale sector and the stipulated conditions can be fulfilled as the norms require only basic compliance conditions.
- FSSAI also offers food safety training and certification programs. There are 5 courses at level 1 (for micro enterprises) and there are 160 training partners in FSSAI ecosystem to conduct the training. FSSAI offers training in 11 regional languages as well.
- In Ratnagiri District FSSAI had conducted a consolidated training program covering upgradation of quality standard, labelling - packaging, marketing strategy etc.

ICAR

- Proposed project scheme should more focus on eastern and northeastern states of the country, which are actually lagging far behind in food processing sector.
- Food processers could be afraid of such regulatory framework (like FSSAI etc.) if they were told to comply regulatory norms at the beginning. To encourage them, it will be better to allow them to establish the unit and regulatory requirement can be fulfilled later on.
- ICAR can offer technological training during the process of project implementation. They have developed good technology for managing dust and storage of seasonal raw materials.
- Proposed project has a capping limit of INR 25 Lacs (total investment in units) maximum. But in various cases, where SHGs are involved or units manufacture multiple commodities, the capping limit should be extended up to INR 40 Lacs at least.
- Market linkage and accessibility to market should be created

NABARD

- Financial institutions should not be made part of environmental-social assessment/screening/review process for decision making since they have own RBI direction and board approved policy on sustainability. Also they are not having relevant expertise. The assessment, which will be done by district and state level implementing bodies should be enough for decision making.
- Various microfinance entities should be engaged in the project
- CGTMSE scheme may be considered as a model for this project, the scheme is quite flexible about collateral mortgage

Ministry of Woman and Child Development Representative

- All concerned line of ministry should be intimated about the project implementation and coordinated.
- There are about 14 lacs SHG Aganwadi centres operating in food business. They could also be made part of the project
- Project should not exclude forest produce since project targets tribal communities as well.

Department of Food Processing, Punjab Representatives

- In Punjab the food processors are lacking basic level of training. A preliminary training on food safety, hygiene, environmental management, branding, marketing etc. will be helpful for the targeted groups of the project.

Horticulture and Food Processing Department, Uttar Pradesh

- Balanced and sector specific guideline may be developed by FSSAI focusing targeted small scale entrepreneurs.
- Decision of Bank should be communicated to applicant (entrepreneur) in time bound manner whether they are agreeing to lend or not.

MoFPI

- The EMF should separately discuss the possible impact to workers from health safety point of view and the potential threat to surrounding community of the food processing units. Also the potential impact to young workers of the unit need to be discussed.
- Central body will allocate the fund to the states. Nodal agencies of respective states will actually be responsible to implement the project. State specific implementation strategy considering its relevancy could be developed by the Nodal Bodies of the states.

3.4. Mapping of Standards for commodities

Following is high level mapping of commodities for which FSSAI has released standards and those for which standards are not yet available.

Table 45 – List of standards for commodities covered as a part of the assessment

Category	Standard available	Standard not available
Dairy products	• Paneer • Ghee • Ice Cream • Dairy based desserts	-
Fruits & Vegetables processing	Pickle, Fruit juices Murraba, Organic vegetables, Chutni Jaggery Aamchur (Dried Mango Powder) Mango Jelly, Aam Papad (Dried Mango Slices) Squash	Fruits & Vegetable powder
Grains & oilseed processing	Rice Flour Wheat flour Spices Vegetable Oil	Pulse (Dal Unit) Soya Milk
Packaged food	Bakery Nuts	Papad Namkeen & Snacks

4. Environmental Management Framework (EMF)

4.1. Introduction

i. The Environmental Management Framework (EMF) section is required to inform and guide the Project Implementing Agency and associated departments at a strategic decision-making level. This frame work defines a mechanism to identify the key environmental, health, safety, hygiene and food safety related concerns of unorganized food processing industries.

ii. The objective of this framework is to minimize impacts and risks, and mitigate them to the extent possible. Implementation of the EMF will also support and assist in complying with applicable (both national and state) laws and regulations and also with the relevant Bank's operational policies on environment issues. Development of the EMF therefore is intended to:

- Enhance positive and sustainable environmental outcomes associated with the project implementation
- Support the integration of environmental aspects into the decision making process in the planning and implementation process at the individual package level
- Minimize environmental degradation as a result of either individual sub-projects or their cumulative effects

iii. The need for environmental management framework is majorly driven by the objective of IFPVAP, which aims to develop and enhance the performance of unorganized food processing industries in India. Various sub-components, when implemented, also require that no environmental risk is left without mitigation.

4.2. Desired outcomes of EMF

iv. This EMF has been developed on the basis of applicable national regulations and World Bank guidelines, as applicable on the date of this document. Any proposed laws and regulations or guidelines that were notified as 'draft' at the time of preparation of this document have not been considered.

v. The EMF will be integrated into the preparation and implementation stages of the various project components. It is an essential ingredient aligned with the project/sub-project activities and is to be followed through the entire project cycle from planning, including site identification; design; implementation and operation/ maintenance to attain the above outlined purpose and objectives. vi. The application and implementation of the Environment Management Framework will also support the achievement of compliance with applicable laws and regulations as well as with the requirements of relevant Bank policies on environment aspects.

4.3. Mitigating potential impacts of proposed project IFPVAP

4.3.1. Principles for developing an Environmental Management plan and corresponding action checklist for various food sectors.

vii. IFPVAP's project interventions essentially relate to enhancing the processing capacity of target beneficiaries food processing firms (Individual Entrepreneurs, Proprietorship and Partnership firms).

viii. While the project is not likely to have any adverse environmental impacts, all possible safeguard measures for the challenges mentioned in previous chapter will be integrated into the project cycle through implementation of EMF. In light of the challenges, and also given the level of available information regarding scope of various activities under project components, it is observed that the project has definitely triggered two World Bank Safeguard Policies: OP 4.01: Environment Assessment; OP 4.09: Pest Management.

ix. The list of likely impact, mitigation measures and responsible agencies are provided in table below:

Table 46 – Impact mitigation matrix for the assessed enterprises along with the implemntation responsibility

Parameters	Impacts identified from Sector	Proposed Mitigation Measure
Dust Generation	Significant dust generating sectors are Grain and Oil Seed Processing including Spice manufacturing. However, the impact is localized and usually confined within the processing unit. Very low level of dust is generated from Packaged food, fruits and vegetable processing units which is localized and short term in nature. Generation of dust is not observed from Milk and Dairy processing units.	• In case of Grain and Oil Seed processing units (like flour milling) process generated dust can be removed by using fabric bag filters, scrubbers. • Provision of mask should be kept for the workers exposed to dust
Air emissions	Possibility of significant air emission is envisaged from boiler operation. Boiler is found in units like Fruit and Vegetable processing, Grains and Oil seed Processing (Rice Mills, Soya Milk/Tofu) manufacturing units; Milk and Dairy product processing units. Among packaged food sector, operation of Ovens used for baking (especially where wood is used as fuel) may generate significant air emission. Snacks manufacturing units may generate fumes during the frying process. It is observed that generally the fume is localized in natures and remain confined within the unit only. Some medium level of emission is observed in various units like Milk and Dairy Product, Fruits and Vegetable where diesel fed burners are being used. Similar kind of units in some cases use locally available organic fuel (fuel wood, cow dung cake, husk etc.), which may generate emission to some considerable extent.	• All the units equipped with boiler should ensure that pollution control device (like multi cyclone /bag filters / wet scrubbers) is installed in boiler. • Provision for adequate exhaust fan and ventilation systems to be provided in process area. • Open burning of organic fuel like cow-dung cake, husk, wood etc. (used in earthen oven in various sectors) should be avoided and burner operated by cleaner fuel like Compressed Natural Gas or electricity should be introduced.

Noise Generation	Grain processing units (flour milling) has been identified as the only significant noise generating sector among the other food processing units. The nature of noise generation is localized and usually	• The workers exposed to higher level of noise should be provided with ear plugs. • Job rotation practice may be adopted so that workers don't get exposed to higher level of

Parameters	Impacts identified from Sector	Proposed Mitigation Measure
	confined within the processing unit. None of the other units were generating any major noise.	noise continuously for longer period.
Wastewater	Major process generated waste water ins observed in Dairy-Milk Processing and Soya Milk-Tofu manufacturing units. Both the type of units generate significant waste water from cleaning as well. Apart from Rice mills, other units in Grain-Oil Seed Processing Spice manufacturing unit do not generate any waste water from process. Sectors like fruits & vegetable processing, packaged food generally produce waste water from cleaning and washing activities. Units from all the sector generate municipal sewage to some extent.	• Process generated waste water and municipal waste water should be separately managed. • Since the target units are of very small types, at individual the units can't develop any facilities to treat waste water. A common Sewage treatment facility for cluster of units may be developed. If the units are located sporadically and a common water treatment facility is developed, the arrangement should be made for doorstep collection of waste water on regular basis. For this, the units also need to develop a temporary storage facility for waste water. • Effort to be given is reuse of cleaning/washing water in toilets (flashing) to the maximum extent possible • Septic tank and/or discharge to municipal sewage system must be ensured for management of municipal sewages • Indiscriminate discharge of waste water should not be allowed
Solid Waste	Most commonly found solid waste from all across the sectors mostly contain packaging waste. Units like Fruits & Vegetables, Grains & Oilseed units generate some organic waste of to some considerable amount. Some units also generate ash from process of burning of organic fuel	• Segregation of solid waste (organic/inorganic) should be done at source. • Separate Bins to be provided in the units for temporary storage of waste prior to collection by municipality waste collector/authorized vendor. • Indiscriminate disposal of solid waste should not be allowed by any means • Effort to be given to recycle packaging waste to the extent possible. • Some of the organic waste (like soybean residue, husk and peeled material) has a potential to be used as cattle feed /manure. These type of may be disposed of wisely and should not be wasted
Other Waste	In packaged food sector from snacks manufacturing units waste oil is generated (generated due to process of frying)	The soap manufacturing units have a demand of used cooking oil. These type of waste could be disposed through soap manufacturing units.

Parameters	Impacts identified from Sector	Proposed Mitigation Measure
Use of DG Set	DG set installed as power backup in number of units covering all sectors. It is a potential source of noise and air emission. Used oil of minor volume is generated from DG sets. This is hazardous in nature and needs safe disposal.	• The DG sets should have valid Pollution Under Control Certificate (PUC) • The exhaust pipe/stack should open to external environment and adequate height of stack should be maintained so that it's emission doesn't disturb the nearby surrounding • Provision for Acoustic enclosure should be kept for the DG set
Use of Boiler	Boiler is a potential source of air emission. The flue gas from boiler may contain PM, SO2, NOx etc.	Particulates Matter from boilers can be removed by the installation of multi cyclone, bag filters and wet scrubbers. Gaseous pollutants like SO2 are subjected to treatment by wet scrubber
Fire Risk	Possibility of fire risk is envisaged from the following situations: • Boiler operation due to the use of fuelwood being used in unit operating with a boiler as a part of the operations. • Use of ovens using organic fuel (fuel wood, cow dung cake, husk etc.) used for cooking/boiling operations across some of the units such as dairy, fruits & vegetable processing and packaged food. • Possibility of short-circuit which may lead to a fire which is applicable to all the units covered as a part of the assessment. • Possible risks relating to the use for compressed natural gas cylinders as a part of the cooking/boiling operation such as Bakery, Dairy, units manufacturing snacks, Fruits and Vegetable processing. • Possible risks arising from storage of diesel and other combustible items being used as fuel for powering the burners and running the DG sets.	• Proper registration of the Boiler and compliance with the terms and conditions including a certified operator. • Obtaining a Fire NOC from the local fire department so that required fire prevention mechanisms can be put in place.

Parameters	Impacts identified from Sector	Proposed Mitigation Measure
Occupational Health and Safety	Possibility of injury arising out unforeseen circumstances such as: • The identified fire safety risks identified above. • Moving parts of machines like the mixers being used in the Bakery or different milling machines or the Tofu making pressing operations. • Operations relating of boiling, baking involving high temperatures. • Instances of slip and fall due to untidy, un-kept and wet floor. • Impact due to incorrect posture or repetitive work such as	• Proper registration of the Boiler and compliance with the terms and conditions including a certified operator. • Obtaining a Fire NOC from the local fire department so that required fire prevention mechanisms can be put in place. • Use of machine guards for moving parts. • Use of appropriate Personal Protecting Equipment such as heat resistant gloves for handling hot material/equipment, Ear plugs and mask as a preventive measure for process involving high noise level and dust.

4.3.2. Principles to mitigate impacts due to development of physical infrastructure:

x. Apart from the specific issues presented in the previous chapter as part of the field survey findings of target food processing industries, EHS issues related to development of physical Infrastructure (for potential construction of common facility centers and setting up any additional facility) need to be addressed.

Parameters	Impacts identified from Sector	Proposed Mitigation Measure
	loading/unloading. Also, workers may get exposed to dust and high level of noise from various industrial processes.	
Emergency Preparedness Plan	None of the units covered under the assessment had an emergency preparedness plan in place. Since the risk profiling for these units is high given their unorganized status it is important to have a plan in place even for the smallest of units. In the absence of such a plan, the unit is not equipped to swiftly deal with situation which may define certain life and death situations	Preparation of a basic level of emergency preparedness plan and awareness among the workers covering areas such as natural calamities, operational health & safety and the risks associated with the industry
Training for operators	Operators needs to be trained only when operating critical machinery like boilers. However, training on health, safety, hygiene and food safety essential for food handlers.	Imparting trainings to workers on health, safety, hygiene and food safety. Hiring of trained and certified operators for Boilers

Parameters/Component	Impact Description	Mitigation Measure	Implementation Responsibility

Parameters	Impacts identified from Sector	Proposed Mitigation Measure	
Siting of proposed facilities	Site selection for development of newer facilities is important to rule out any impact associated with loss of forest land, impact on environmentally sensitive/fragile area, waterbody/wetland,	The proposed site for new facilities should be located away from- • Environmentally sensitive area (like forest, protected area, wildlife corridor etc.) • Water bodies / wetland	Design consultant Nodal Agencies of respective states MoFPI

xi. The project proposes to develop newer facilities like warehouse, storage area, common facilities and any other similar infrastructure requirements as per the requirement of the project. The envisaged impact associated with construction of new facilities are discussed in the following section. Proposed mitigation measures are suggested for the foreseen impacts. In case of development of newer facilities, project specific Environmental Management Framework will need to be developed and site specific Environmental Assessment will be required to be undertaken. However, program level EMF for construction activities is presented below:

Table 47 – Impact mitigation matrix for any planned construction activity along with the implemntation responsibility

	Coastal regulatory Zones (CRZ), Archaeologically /Anthropologically important site etc. At the same time, the site should not be located where natural/ anthropogenic hazard is prominent.	• CRZ • Areas prone to natural calamity • Significant Pollution generating source (like polluting industries, quarry site, crusher etc.) • Residential areas • Archaeologically/Anthropologicall y Important Site • Any site of national or international importance	
Acquisition of land and property; Change of Land Use	For development of new facilities land and property acquisition may take place. The prevailing land use will change permanently	• Suitable compensation to the Project affected People (PAPs) for loss of property • Livelihood restoration	Nodal Agencies of respective states
Setting up of construction camp for labour/worker	Setting up of temporary construction camp may led to the following situation • Water/Land Contamination due to sewage discharge from camp • Unhygienic condition - discharge from labour camp, generated waste may create unhygienic condition, breeding ground for pests-vectors	• Hiring of local labours/workers to the maximum extent possible • Provision of toilets/septic tanks and adequate drainage to ensure that discharge doesn't contaminate nearby environment	Contractor Nodal Agencies of respective states MoFPI
Vegetation Cover removal	Clearance of trees/vegetation may cause soil erosion beside ecological loss	• Compensatory plantation • Grass turfing to avoid soil erosion once construction work is over	Contractor Nodal Agencies of respective states MoFPI

Site preparation (Excavation, drilling and levelling)	Site preparation activity may lead to- Dust generation due to site levelling/excavati on • Air pollution from equipment/vehicl e • Soil erosion	• To be ensured that the construction activity immediately starts just after site clearing to avoid soil erosion • Water sprinkling to prevent fugitive dust Vehicles / equipment used should have valid Pollution Under Control certificate (PUC)	Contractor Nodal Agencies of respective states MoFPI
Disposal of Debris	Debris generated from construction work may cause significant impact to the surrounding environment like contamination of waterbody, soil if not managed properly.	• Debris disposal site/mode of disposal should be identified by the contractor prior to construction work • Debris should be disposed off to designated site or thorough authorized vendor	Contractor Nodal Agencies of respective states MoFPI
Operation of vehicle and construction equipment, operation of concrete mix plants and batching plants (In case, these are installed on temporary basis at the project site)	• Air emission and dust generation from plying vehicle/equipmen t operation • Dust generation due to carriage/handling of material • Noise generation from plying vehicle/equipmen t operation • Chance of Water and soil contamination from oil and grease used	• Vehicle carry raw material should be covered with tarpaulin sheet to prevent dust generation • Water sprinkling to prevent fugitive dust from working sites, haul/access roads • Vehicles / equipment used should have valid Pollution Under Control certificate (PUC) • Provision of temporary noise barrier in working area	Contractor Nodal Agencies of respective states MoFPI
DG Operation for construction work	• Noise generation • Air emission • Generation of Hazardous waste	• Acoustic enclosure should be provided for the DG set • DG Set should have valid Pollution Under Control certificate (PUC) • Hazardous used oil generated from DG set must be temporarily stored in impermeable container before disposal through approve entity	Contractor Nodal Agencies of respective states MoFPI

Storage of diesel (for DG Set, Vehicle/Equipment)	• Contamination of soil/surface water/ ground water due to accidental spillage • Risk of fire	• The diesel should be stored in designated paved area • any accidental spill should be cleaned immediately • fire extinguisher should be installed nearly to diesel storage area	Contractor Nodal Agencies of respective states MoFPI
Abstraction of water	water abstraction due to construction work may lead to water scarcity in the nearby area	• Effort should be given to avoid usage of ground water to the maximum extent possible and Surface water/recycled STP water should be used in construction • In case Ground water or surface water is tapped for the project, necessary permission from Central Ground Water Authority (CGWA) or Irrigation Department respectively • Religious effort should be given to harvest rain water	Contractor Nodal Agencies of respective states MoFPI
Handling of waste	During construction phase there may be generation of both hazardous and nonhazardous waste which needs to be carefully handled to ensure environment safeguard	• Segregation of waste (hazardous and non-hazardous) should be properly done at source • Adequate dustbin should be provided in Labour camps and other suitable areas • The hazardous waste should be disposed of through authorized vendor only • Non-hazardous waste should be disposed of in a designated site or thorough authorized vendor • Regular clearing/disposal of organic waste generated from worker camp to be ensured.	Contractor Nodal Agencies of respective states MoFPI

		should be used	
Labour management	• Occupational Health and Safety accidents and injuries • Child labor and forced labor • Impact on natural resource like plantation/forest	• Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers; • The excavated area should be provided with a visible boundary to ensure safety at site; • Training shall be imparted to workers on occupational safety and technical aspects of job undertaken by them • Provision of first aid kit • Workers should be given basic training on environment and hygiene aspects to ensure not to cause any impact to natural resources like hunting of animal, felling of shrubs/trees for fuel, open defecation etc. • No child labour/forced labour	Contractor Nodal Agencies of respective states MoFPI

4.4. Sector Specific Environmental Management Action Plan

a) In order to facilitate the implementation of Environment Management Principles, sector specific Environmental Action plans have been developed.

b) These are provided in Appendix A1 to A4 in Volume 2: Annexures.

c) These action plans include the following aspects:

- Project appraisal and screening checklist – this checklist is required to be filled by the project beneficiary when applying for assistance under IFPVAP. This checklist serves two main purpose, a) to capture the baseline situation of the beneficiary unit, b) to assess the level of compliance and conditions which are specifically required to be met by the project beneficiary in due course of time.

- The Project appraisal and screening checklist is also required to be disseminated to the project beneficiary as a guiding document for them to address the Environmental Management requirements

- Best practice guidelines – this checklist needs to be shared with the project beneficiary for them to integrate in their operation

- Auditor's checklist - this is a guiding checklist to facilitate periodic monitoring and review of beneficiary's progress in terms of environmental compliance.

d) Going forward during implementation phase, in case any new food processing sector or process is included under IFPVAP (which is not covered here), similar checklist needs to be developed by State Environmental Cell.

4.5. Recommendations for list of activities to strengthen the EMF

Following are key recommendations to further strengthen the EMF.

These actions points will require a level of consultation of the different departments involved in IFPVAP to finalize the role and responsibilities and also check the feasibility of these measures in their respective states:

i. Recommended Action for NPMU/ MoFPI to undertake a dedicated baseline assessment for water, energy, and waste generation characteristics in each of the participating states

    - At the onset of the program, a dedicated baseline assessment of water, energy, and waste generation characteristics (both type and quantum of usage or generation) of the shortlisted units with regards to consumption of raw materials and production of final products, needs to be conducted.
    - This action is recommended to be undertaken during the implementation of sub-component 4 – "Diagnostic studies" under component 1 - Enabling the business environment for the food processing industry."
    - The study should be undertaken by firm hired by MoFPI at the central level.
    - It is recommended that the study should be overseen by the Environmental Safeguard specialist of National Project Management Unit at MoFPI
    - The results obtained from the baseline study should be used as a benchmark for future assessment and to highlight progress in terms of energy consumption reduction or waste generation reduction.
    - The assessment should measure, highlight and promote progress in terms of reduction in consumption of natural resources or reduction in generation of waste.

ii. Recommended action for State PIUs (which will be established in each State Nodal agencies) to facilitate appropriate waste management strategy development for their respective states:

- State-level diagnostic studies (Component 1) will inform the development of State Strategic Upgradation Plans (SSUPs) laying out focus sub-sectors within food processing, and focus locations, based on concentrations of existing firms and an assessment of market opportunities. o Based on the outcome of diagnostic studies and baseline energy and waste generation data, the State Nodal Agencies need to undertake a feasibility study of the following measures to finalize the most effective mechanism for waste handling and disposal in project districts:
    - Should a common waste storage facility be developed and managed by district level coordinators, or
    - Should a dedicated mobile waste collection van be deployed to collect and dispose waste to local authorize vendors
    - The result of the above studies will guide the development of waste management strategy for each district.
- Additionally, The State PIU's should develop and maintain a list of authorized waste disposal vendors active in each district shortlisted for project implementation
- The State PIU's need to promote a standard rate card for collection and disposal of different waste streams.
- These rate cards will act as a source of information for the TSP's at district level, to guide and handhold the MSEs or cluster of MSEs.

iii. State nodal agency needs to explore the feasibility and establish a mechanism (in liaison with the Department of Industrial Policy and Promotion) for assisting the beneficiary with the FSSAI registration process through Single Window Clearance System. The existing infrastructure of various department such as NRLM, KVIC, ATMA etc., can be explored to help the beneficiary fill in the digital form as per the requirement at their office premises.

iv. The Safeguard specialists at NPMU should undertake development of an online reporting system and/or an app-based compliance system to monitor the progress of beneficiary supported by the project. The information on the system/app can be populated by the participating beneficiaries and verified by the implementation agency. The database access can also be shared between different regulatory agencies.

v. The State Nodal Agencies/ State Project Implementation Unit should liaison with FSSAI for creating FSMS food safety guidelines specific to the micro enterprises so that food safety and hygiene parameters are met without burdening the beneficiaries.

vi. Due to limited NABL accredited laboratories and large distances of these laboratories from the location of the beneficiary units, it is recommended that the State Nodal Agencies/ State Project Implementation Unit can undertake a feasibility study for arranging special transportation vehicles which can collect food sample and safely deliver it to accredited laboratories for testing. The State Nodal Agencies/ State Project Implementation Unit can liaison with FSSAI for such a solution and also utilize their existing infrastructure in place.

vii. Currently the project planning and project appraisal process is underway. It is required to establish a mechanism for monitoring the compliance of supported MSEs with various requirements, financing of these activities, action items in case of non-compliance by these units and overall budget allocation. The overall budget allocated for these activities will decide at the time of the project implementation but limited to 1% of the total budget for the project. The finer details will be included in the EMF at the time of project appraisal.

viii. The funds for the above mentioned activities needs to be allocated through EMF Budget.

4.6. Negative list of activities not to be supported by project investments

To avoid adverse Environmental impacts and to ensure that the projects being funded under IFPVAP are aligned with the safeguards requirement, proposals that involve the following activities are explicitly excluded from funding under IFPVAP:

- Industries operating without proper registration of the "Consent to Operate/NOC" from the State Pollution Control Board, "Shops and Establishment registration' from DIC and "Food safety license" from FSSAI.
- Industries not complying with the terms and conditions of the required licenses.
- Works which would adversely affect cultural property, including archaeological and historical sites
- Activities that negatively affect natural protected areas recognized by federal, state or municipal governments (or buffer zones thereof)
- No reclamation of wetlands or filling of water bodies to create land.
- Improper hazardous waste management and disposal.
- Activities which may cause damages to the forest area/natural resource.
- Industries which are not taking adequate measure to abate environmental polluting.

4.7. Recommended measures to enhance the positive environmental outcomes

Table 48 – Measures to enhance the positive Environmental outcomes

S.No	Category	Sub-Sector	Cleaner Production Options
1	Packaged food	Bakeries and Confectionaries	• Minimization of the generation of effluents through process and recycle of wastewaters, aiming for total recycling. • Efforts to reduce odour problems using ventilation systems. • Use of natural gas or liquefied petroleum gas (LPG) for heating of baking oven and boilers.
2	Dairy products	Dairy products	• Installation of efficient water treatment plant for reuse of treated waste water. • Use of rice husk and bagasse as clean fuel instead of coal and diesel in boilers. • Recovery of energy by using heat exchangers for cooling and condensing. • Avoidance of use of phosphorus-based cleaning agents.
3	Grains and Oilseed processing	Edible Oil and Vanaspati	• Prevention of formation of moulds on edible materials by controlling and monitoring air humidity. • Use of citric acid instead of phosphoric acid, where feasible, in degumming operations. • Provision of dust extractors to maintain a clean workplace. • Recovery of solvent vapors to minimize losses. Use of agriculture residue like husk for boiler operation. • Optimization of use water and cleaning chemicals.

		Flour and Pulses Mill	Use of bag filters for dust/product recover from fugitive emissions. Reuse of treated wastewater (separated from storm water systems) to the extent possible. Regular cleaning and washing of equipment.
		Rice Mills	Use of husk in boiler to minimize gaseous pollutants, Reuse of treated wastewater (separated from storm water systems) to the extent possible. Effective measures to control noise pollution including provision of soundproof cabins for noise producing equipment use of silencers etc.
4	Fruits & Vegetables procession	Food and Fruit Processing	Use of dry methods such as vibration or air jets to clean raw fruits and vegetables. Dry peeling methods reduce the effluent volume (by up to 35 %) and pollutant concentration (organic load reduced by up to 25 %). Separation and recirculation of process wastewaters. Use of counter-current systems where washing is necessary. Use of steam instead of hot water reduces the quantity of the wastewater going for treatment.

4.8. Pest Management Plan

xii. The project has a potential to raise pest management issues which may relate to possible indirect effect of stimulating greater use of agro-chemicals associated with more intensive cultivation and/ or higher crop value. In this regards this EMF encourages adoption of Pest Management Plan (PMP) approach and increase beneficiaries 'awareness of pesticide-related hazards. It also necessitates a need for good practices for safe pesticides use and handling as well as to provide relevant training and information dissemination activities.

xiii. The below table depicts the necessary annexures that have been prepared with regards to Pest Management Plan:

Table 49 – Pesticide management measures with references

S No	Pesticide Management Measures	Reference
1	Hazardous Class II (not allowed to use) as per World Health Organization (WHO)	Appendix A10
2	List of Recommended Pesticides (shall be used)	Appendix A8
3	List of Banned pesticides (not allowed to use)	Appendix A9

4.8.1. Principles of Pest Management

xiv. Pest Management Plan promotes judicious use of both chemical and nonchemical control techniques to achieve effective and economically efficient pest management with minimal environmental contamination.

xv. If the use of pesticide application is unavoidable in the food processing unit, then the following actions needs to be undertaken:

- Develop training plan for personnel for application of pesticides
- Use only pesticides that are approved by the WHO, that are slightly hazardous (Class III) and are unlikely to present acute hazards (Class IV).

- Use only pesticides that are manufactured under license and registered and approved by the appropriate authority and in accordance with the Food and Agriculture Organization‘s (FAO‘s) International Code of Conduct on the Distribution and Use of Pesticides;
- Use only pesticides that are labelled in accordance with international standards and norms, such as the FAO‘s Revised Guidelines for Good Labelling Practice for Pesticides;

xvi. Accidental spills during transfer, mixing, and storage of pesticides leading to contamination of soils, groundwater, or surface water resources, should be prevented. This can be achieved by following measures:

- Pesticide containers should not be used for any other purpose (e.g. drinking water) and should be handled as hazardous waste.
- Records for pesticide use and effectiveness should be maintained
- Storage spaces for pesticides should be clearly highlighted, the storage conditions should be maintained as per the Material Safety Data Sheet (MSDS) or package instructions.

4.9. Budget for EMF Implementation

The budget for EMF implementation should be framed by respective state by assessing the requirement of infrastructural development, number of Environmental Management Cells to be created, requirement of staffs in Environmental Management Cells and other developed facilities (like laboratory technicians, ETP operators) etc. once the overall need is finalized.

The exact quantum of Budget to be utilized for EMF cannot be estimated. This heavily depends on the actual project implementation structure as proposed by SPMU and agreed by NPMU for catering to 143 districts across 4 states.

However, it is recommended that the EMF budget should be allocated to the tune of 1% of the entire project cost.

The budget for EMF implementation should include the following components as a furnished below:

- Development of Environmental cell at different levels (hiring of experienced professionals at central, state and district level)
- Provision for training and calibration of implementing agencies and also for the project beneficiaries, as per the prescribed training plan
- Ensuring that the following feasibility studies, product development and hiring of appropriate agencies and individuals for implementation of EMF is being fulfilled:
  - Baseline assessment of water, waste and energy footprint
  - Design of a digital app based system to for managing environmental data of project beneficiary at the time of registration and linking it with periodic monitoring and supervision data. o Periodic monitoring of EMF implementation
  - Assistance in establishing infrastructure or mechanism for compliance of beneficiary units on environmental parameters
  - Assistance in establishing infrastructure or mechanism for food testing requirements or waste management systems.

5. EMF Monitoring and supervision

5.1. Understanding existing monitoring arrangements under IFPVAP

i. The monitoring and supervision of EMF needs to be aligned with the overall monitoring arrangement.

ii. As per the project appraisal document for IFPVAPP, at the national level MoFPI, through the PMU, will lead M&E for the project. The responsibilities of the PMU will include: (i) periodic program progress reviews; (ii) consolidating and disseminating information on program progress reports from states and nodal agencies (including reporting on beneficiary satisfaction with project design and delivery, fiduciary performance, and safeguard compliance); (iii) reporting on project achievements against the agreed project Results Framework; and (iv) commissioning surveys, studies, and assessments as necessary.

iii. At the state level, SNAs will be responsible for preparing and submitting quarterly reports on implementation progress. To support reporting processes, the PMU will design standardized reporting templates to ensure that project reports provide clear and transparent progress updates on all relevant aspects of the Results Framework and on key implementation parameters.

iv. TSPs will be hired at the national and state level to develop a project specific MIS, which could incorporate a geographic information system and the latest innovations in data collection and measurement. Efforts will be made to combine MIS development with development of the other online platforms that support project activities.

5.2. Monitoring and supervision of EMF

v. The monitoring of safeguard requirements under this project is proposed at two level of periodicity – i) Regular and ii) Annual monitoring

- Regular monitoring shall be carried out by the TSP's at the district level and outcome reported back to the Environmental Nodal Officer of the respective state. The regular monitoring will be based on the monitoring checklist as described in Volume 2: Annexures as part of Environmental Management Plan (EMP) devised for the food processing sectors covered. The corresponding observations should be compiled as part of a Quarterly Environmental Monitoring Report.

- Annual monitoring needs to be overseen by the central level by Environment Specialist at NPMU and needs to be undertaken by the state level nodal officers at PIU. The method of monitoring includes monitoring environmental performance indicators, desktop review, record check-up, management plan, and external site visit and stakeholder consultations.

- An annual summary of actions needs to be provided at the central level. The key outcomes of the summary should be shared with World Bank.

5.2.1. Monitoring checklist

vi. Monitoring checklist have been developed for each food processing sector addressed in this study. vii.

These checklist are provided in Appendix A1 to Appendix A4.

viii. Going forward during implementation phase, in case any new food processing sector or process is included under IFPVAP (which is not covered here), similar checklist needs to be developed by State Environmental Cell.

5.3. Proposed routine for audit and verification

ix. In order to effectively monitor the performance of environmental safeguards and maintain the robustness of monitoring and inspection, a two-step routine for audit and verification is proposed. This is described as follows:

- Internal Audit: is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of processes. Internal audit is recommended for advising management regarding how to better execute their responsibilities.
- It is recommended at the end of first year one internal audit should be carried out by the Environmental Specialists (at center and state level) for effective and smooth operation of the project
- External Audit: Independent external audits should be conducted twice during the project duration—one at the end of the second year and another at the end of the third year. An external competent environment agency should be hired in accordance with the World Bank‘s procedures for procurement guidelines for undertaking external audits.

6. Institutional arrangement and capacity development plan

a) The nodal Ministry of food processing industries and the corresponding departments at the state level with the help of State Nodal Agencies (SNAs) would implement GSY. Professionally run Project Management Units at the National, State and District levels will be set up. In order to implement and monitor the programme at the cluster level, Technical Support Providers (TSPs) will provide last mile services to the micro enterprises. In order to ensure results, TSPs will be paid based on their performance in terms of achievement of milestones for the target enterprises.

b) GSY will be monitored by an inter-ministerial empowered committee under the chairmanship of Secretary, MoFPI, a State Level Empowered Committee (SLEC) chaired by the Chief Secretary and a District Level Committee under the District Collector.

c) A dedicated Project Management Unit (PMU) will be established within the Ministry to lead implementation activities and coordinate with participating states, agencies and institutions. The PMU will be staffed with technical specialists and be responsible for overall management and coordination of project activities. As the program is part of a GoI scheme, the PMU will also be responsible for implementing existing government systems for social and environmental safeguards, and procurement and fiduciary oversight.

d) During preparation, the World Bank and MoFPI will undertake consultations and reviews of implementation arrangements in selected states and strategies to enhance implementation capacity at the state level will be worked out.

e) During Initial phases of the project, the World Bank will work with MoFPI in strengthening coordination mechanisms with states and in strengthening exchange of implementation and best practice experience between states.

Table 50 – List of State Nodal Department/Agencies

State	State nodal department/agency	Description
Andhra Pradesh	Andhra Pradesh Food Processing Society (APFPS)	Established by the Government of Andhra Pradesh under the Andhra Pradesh Societies Act in 2012, APFPS is the nodal agency for development of the food processing sector in the state. It has implemented several investment promotion and enterprise support initiatives.
Maharashtra	Department of Agriculture (DoA)	Department of Agriculture, Maharashtra is the nodal department for implementation and monitoring schemes related to food processing in the state.
Punjab	Punjab Agro Industries Corporation (PAIC)	PAIC is a corporation promoted by the Punjab Government in 1966 with shareholding by both the state and central governments. It is the lead body for promoting agro-based industries in the state and implements several investment promotion and enterprise support programs.

Uttar Pradesh	Department of Horticulture and Food Processing (DoHFP)	This department is responsible for implementation and monitoring central and state government schemes related to food processing. Within the department, the Directorate on Food Processing is the agency responsible for food processing in the state.

e) During preparation, the World Bank and MoFPI will undertake consultations and reviews of implementation arrangements in selected states and strategies to enhance implementation capacity at the state level will be worked out.

f) During Initial phases of the project, the World Bank will work with MoFPI in strengthening coordination mechanisms with states and in strengthening exchange of implementation and best practice experience between states.

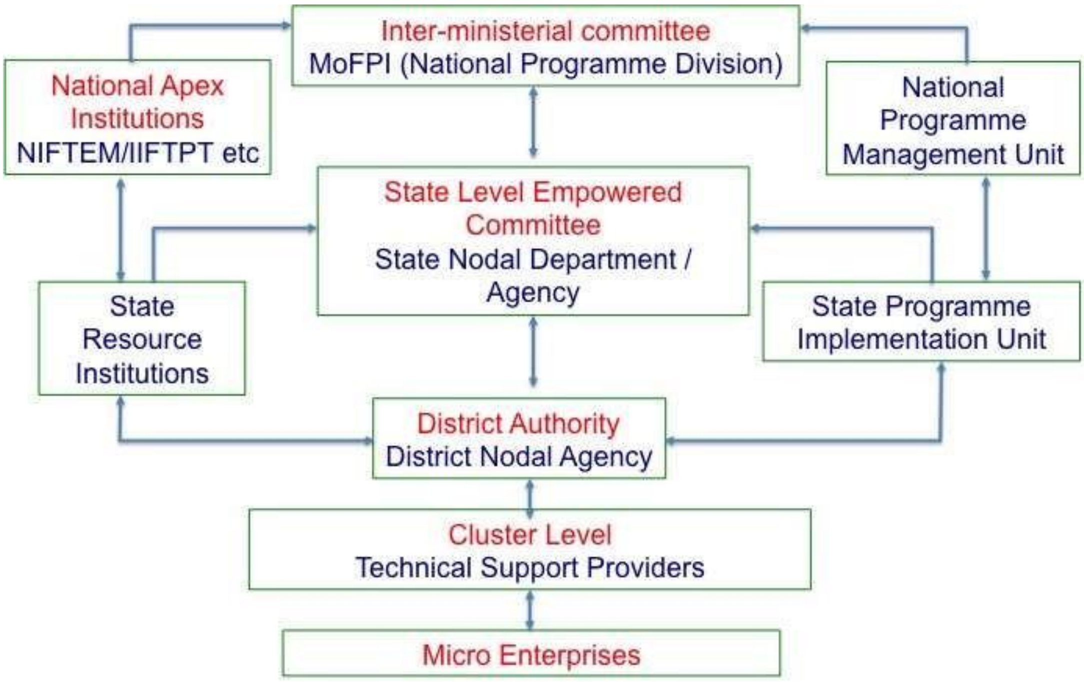


Figure 8: proposed implementation structure

6.1. Proposed implementation arrangements for EMF

g) The figure below describes the proposed hierarchy for the implementation of the Environmental Management Framework (EMF). The Ministry of Food Processing Industries (MoFPI) will be the apex body for implementation of Gram Samridhi Yojana all across the country. The State Nodal Agency or a Department identified by MoFPI would be implementing the project in their respective states. The Technical Support (TSP) who will help them in implementing the project at a ground level. The following figure provides a glimpse of key responsibilities for project appraisal and extending credit to the project beneficiary:

h) The proposed EMF implementation framework needs to take into account the above project appraisal structure.

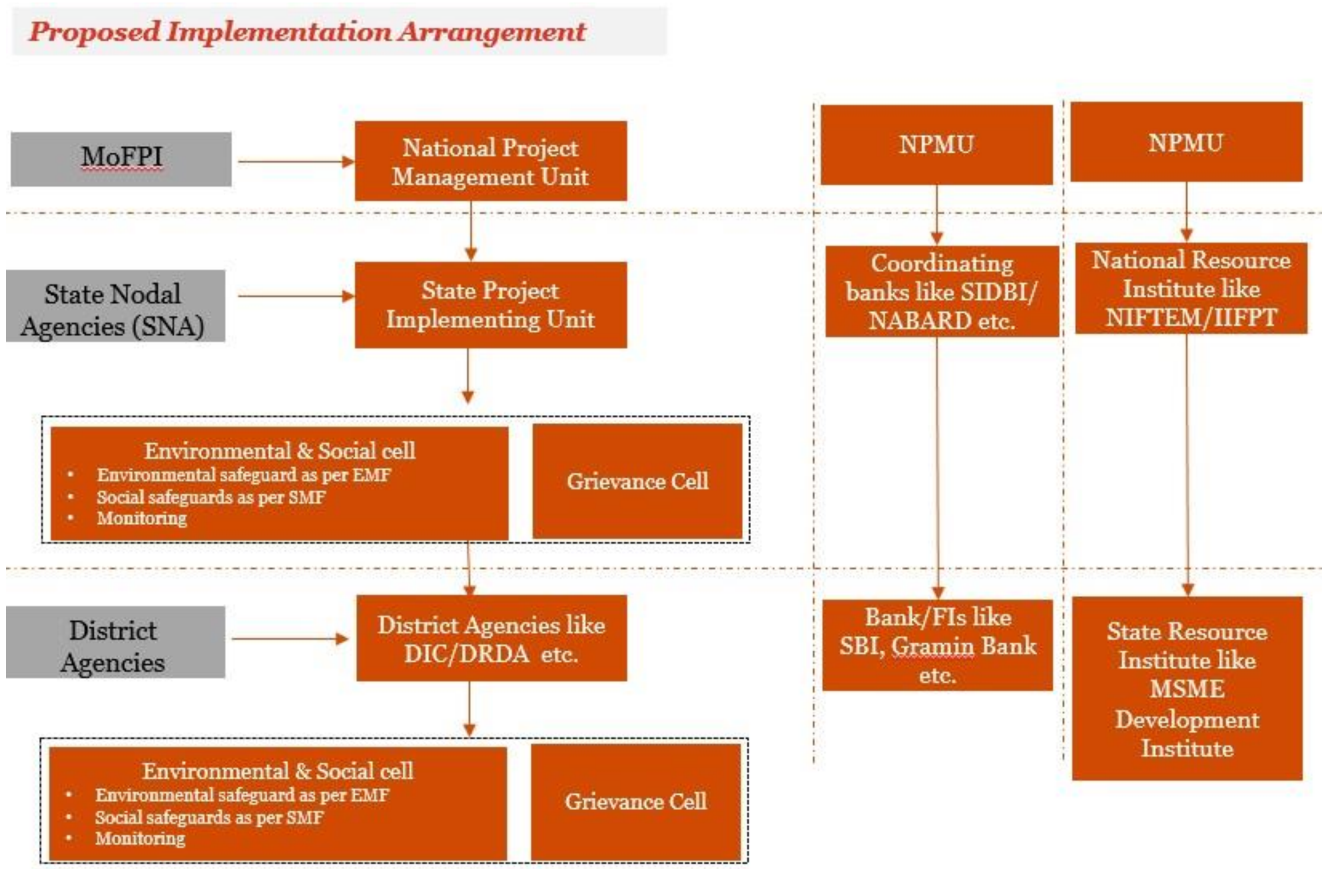


Figure 9: Proposed roles and responsibility matrix for the implementation arrangement for the EMF

6.1.1. Roles and responsibilities at district level

i) At the cluster Level, the TSP's will ensure effective implementation of EMF and compliance to the Environmental and Food Safety Norms of the respective industrial unit. The role of TSP's includes but not limited to:

Table 51 – Roles and responsibilities of TSP's for the implementation for the Environmental Management Framework

S No	Responsibility	Recommended actions
1	Implementation of EMF	• Supervise implementation of EMP throughout project implementation period; • Ensure handholding for disposal of waste water, solid and other waste in environmentally acceptable manner • Regular review of environmental monitoring reports from respective units/ common facilities • Ensure performance and adequacy of installed pollution mitigation devices at units and common facilities (as applicable) by regular visits and inspection

2	Coordination with other stakeholder	• Coordinate with Financial Institutions (at district/local level) regarding compliance of industrial units prior to disbursement of

S No	Responsibility	Recommended actions
		fund, assistance • Coordination with respective counterparts of regulatory bodies like State Pollution Control Board (SPCB) and Food Safety and Standards Authority of India (FSSAI) • Coordination with State training institute.
3	Product standardization monitoring	Regular review of Raw Material and finished product quality test reports from respective units.
4	Reporting	Prepare quarterly progress reports on the implementation of the EMP throughout the project period and submission to State Nodal Agencies. This report with cover aspects like: ○ List of units participating in the project ○ Status of trainings for the participating units ○ Unit review statement covering aspects like compliance level for different regulatory requirements for Environment, Health & safety, Food safety and Hygiene.

6.1.2. Roles and responsibilities at State Level

j) At State Level, the role of Environmental Management Cells of respective State Nodal Agencies will include ensuring compliance of pertaining laws, policies, regulation for project in their respective states, coordination and liaising with government stakeholders as well as the World Bank with respect to various Environmental, Health-Safety, Food safety and hygiene issues. Role of this cell will also include preparation of half-yearly progress reports on the implementation of the EMP throughout the project period and submission to MoFPI.

k) As a part of this assessment, the State implementation agency will coordinate with the lending bank for disbursement of fund/assistance to the target units operating at food processing sector providing confidence that any activity highlighted in the negative list is not being undertaken.

6.1.3. Roles and responsibilities at Central Level

l) MoFPI, through the dedicated NPMU, will be responsible for EMF at the central level. The Environmental Safeguard specialist at the NPMU will have overall responsibility to ensure compliance of laws, policies, regulation pertaining to the project, implementation of project in a sustainable way, coordination with national level regulatory agencies as well as World Bank, allocation of fund for institutional capacity development etc. Role of this cell will also include preparation of yearly progress reports on the implementation of the EMP throughout the project period and submission to World Bank.

6.1.4. Key personnel requirements for implementing the EMF

The World Bank project appraisal document details that a self-standing PMU will be established under MoFPI at the national level. The PMU will have overall responsibility for managing and coordinating project activities, including procurement and financial management. It will be headed by a project director and be supported by dedicated personnel. In coordination with SNAs, the PMU will oversee planning and budgeting of project

activities and execute the approved Annual Work Plan and Budget (AWPB). It will also oversee agreements and Memorandums of Understanding (MoUs) with national technical institutions (NIFTEM and IINPT), technical supervision and quality control, gender inclusion, environmental and social safeguards, and M&E.
The PMU will comprise of a team hired on a competitive basis and composed of technical specialists The PMU will oversee planning and preparation of project budgeting activities in consultation with SNAs/PIUs. It will be responsible for all technical supervision and quality control of project activities, including fiduciary aspects, gender and social inclusion, environmental and social safeguards, and M&E arrangements at the state-level. The PMU will also support participating states to enhance implementation of project components, meet fiduciary and safeguard requirements, and spur adoption of learning and best practices from implementation across states. The same structure will be replicated at the State level.

It is recommended that the PMU and PIU's have a dedicated Health & Safety and Food Safety expert each. However, in the absence of such an expert this role can be covered by a senior Environmental expert. The key personnel requirement for the implementation would include one Environmental and each at the National and the State Level along with eighty Environmental, Health & Safety and Food Safety TSPs at the district level.

Table 52 – Key responsibilities and qualification of the required personnel

Experts	Responsibility	Qualification
Senior Environmental Expert at the National level	- Shall be responsible for providing technical inputs on implementation of the different interventions. - Shall be responsible for ensuring compliance of laws, policies, regulation pertaining to the project. - Shall be responsible for implementation of project in a sustainable way. - Shall be responsible for coordination with national level regulatory agencies as well as World Bank, allocation of fund for institutional capacity development etc. - Shall be responsible for coordinating training sessions and awareness programs. - Shall provide necessary inputs towards formulating training modules and imparting training. - Shall be responsible for coordinating between PIU's of different regions for preparing Environment Information Dissemination Brochures for the interventions. - Shall be responsible for coordination with the participating national level regulatory agencies/ministries and departments as well as World Bank. - Shall review the yearly Environment Monitoring report and sharing it with the World Bank.	- Environmental degree or equivalent qualifications - Working experience of atleast 10 years in the relevant field. - Preferably 10 years' experience in designing and implementation of ESMS in the relevant field. - Demonstrated ability to interact effectively with key stakeholders at all levels
If required		

Senior Health & Safety and Food Safety Expert at the National level	*Shall be responsible for providing technical inputs on implementation of the different interventions.* *Shall be responsible for ensuring compliance of laws, policies, regulation pertaining to the project.* *Shall be responsible for implementation of project in a sustainable way.* *Shall be responsible for coordination with national level regulatory agencies as well as World Bank, allocation of fund for institutional capacity development etc.* *Shall be responsible for coordinating training sessions and awareness programs.* *Shall provide necessary inputs towards formulating training modules and imparting training.* *Shall be responsible for coordinating between PIU's of different regions for preparing Health & Safety and Food Safety Information Dissemination Brochures for the interventions.* *Shall be responsible for coordination with the participating national level regulatory agencies/ministries and departments as well as World Bank.* *Shall review the yearly Health & Safety and Food Safety Monitoring report and sharing it with the World Bank.*	*Industrial health safety or Emergency preparedness degree or equivalent qualifications* *Health and Safety certification* *Preferably 10 years' experience in conducting occupational and community health & safety assessments in the relevant field.* *Demonstrated ability to interact effectively with key stakeholders at all levels*
Environmental Expert at the State level	Shall be responsible for providing technical inputs on implementation of the different interventions. Shall be responsible for ensuring compliance of pertaining laws, policies, regulation for project in their respective states. Shall be responsible for coordination and liaising with government stakeholders as well as the World Bank with respect to various Environmental issues. Shall review the half-yearly Environment Monitoring report and sharing it with the National Project Management Team. Shall arrange, organize and provide necessary inputs towards formulating training modules and imparting training. Shall be responsible for coordinating with the lending bank for disbursement of fund/assistance to the target units operating at food processing sector providing confidence that any activity highlighted in the negative list is not being undertaken.	Environmental degree or equivalent qualifications Working experience of atleast 5 years in the relevant field. Preferably 5 years' experience in designing and implementation of ESMS in the relevant field. Demonstrated ability to interact effectively with key stakeholders at all levels

If required		
Health & Safety and Food Safety Expert at the State level	*Shall be responsible for providing technical inputs on implementation of the different interventions.* *Shall be responsible for ensuring compliance of pertaining laws, policies, regulation for project in their respective states.* *Shall be responsible for coordination and liaising with government stakeholders as well as the World Bank with respect to various Health & Safety and Food Safety issues.* *Shall review the half-yearly Health &*	*Industrial health safety or Emergency preparedness degree or equivalent qualifications* *Health and Safety certification* *Preferably 5 years' experience in conducting occupational and community health & safety assessments in the relevant field.* *Demonstrated ability to interact effectively with key stakeholders at all levels*

	Safety and Food Safety Monitoring report and sharing it with the National Project Management Team. - *Shall arrange, organize and provide necessary inputs towards formulating training modules and imparting training.* - *Shall be responsible for coordinating with the lending bank for disbursement of fund/assistance to the target units operating at food processing sector providing confidence that any activity highlighted in the negative list is not being undertaken.*	

Environmental, Health & Safety and Food Safety Expert in the TSP	- Shall be responsible for supervising implementation of EMP throughout project implementation period;
	- Shall be responsible for ensuring handholding for disposal of waste water, solid and other waste in environmentally acceptable manner
	- Shall be responsible for regular review of environmental monitoring reports from respective units/ common facilities Shall
	- be responsible for ensuring performance and adequacy of installed pollution mitigation devices at units and common facilities (as applicable) by regular visits and inspection
	- Shall be responsible for coordinating with Financial Institutions (at district/local level) regarding compliance of industrial units prior to disbursement of fund, assistance.
	- Shall be responsible for coordinating with respective counterparts of regulatory bodies like State Pollution Control Board (SPCB) and Food Safety and Standards Authority of India (FSSAI).
	- Shall be responsible for coordinating with State training institute.
	- Shall be responsible for regular review of Raw Material and finished product quality test from the respective units.
	- Shall be responsible preparing quarterly progress reports on the implementation of the EMP throughout the project period and submission to State Nodal Agencies/State Project Implementing Unit. This report with cover aspects like:
	  ○ List of units participating in the project
	  ○ Status of trainings for the participating units
	  ○ Unit review statement covering aspects like compliance level for
		- Preferably environmental degree or equivalent qualifications
		- Preferably Health and Safety certification
		- Working experience of atleast 2 years in the relevant field.
		- Preferably 2 years' experience in implementation of ESMS in the relevant field and conducting occupational and community health & safety assessments.

	different regulatory requirements for Environment, Health & safety, Food safety and Hygiene.	

6.2. Proposed Grievance Redress mechanism

As per the IFPVAP project implementation plan dated April 2019, grievance redressal mechanism has been developed and proposed. Prompt grievance redressal enables target beneficiaries to develop trust in the processes and be willing to participate in project activities. Thus, the project monitoring system will provide information on the number of complaints received against the number actually resolved. The National Portal will have a dedicated window for registering grievances.

Stakeholders at various levels (enterprise/district/state) will be able to register their grievances in this portal through an appropriate representative at each level. Enterprises could register their grievances through a mobile app to their enterprise representative and in turn, this would be escalated to higher levels. The process of submission of grievances is illustrated below:

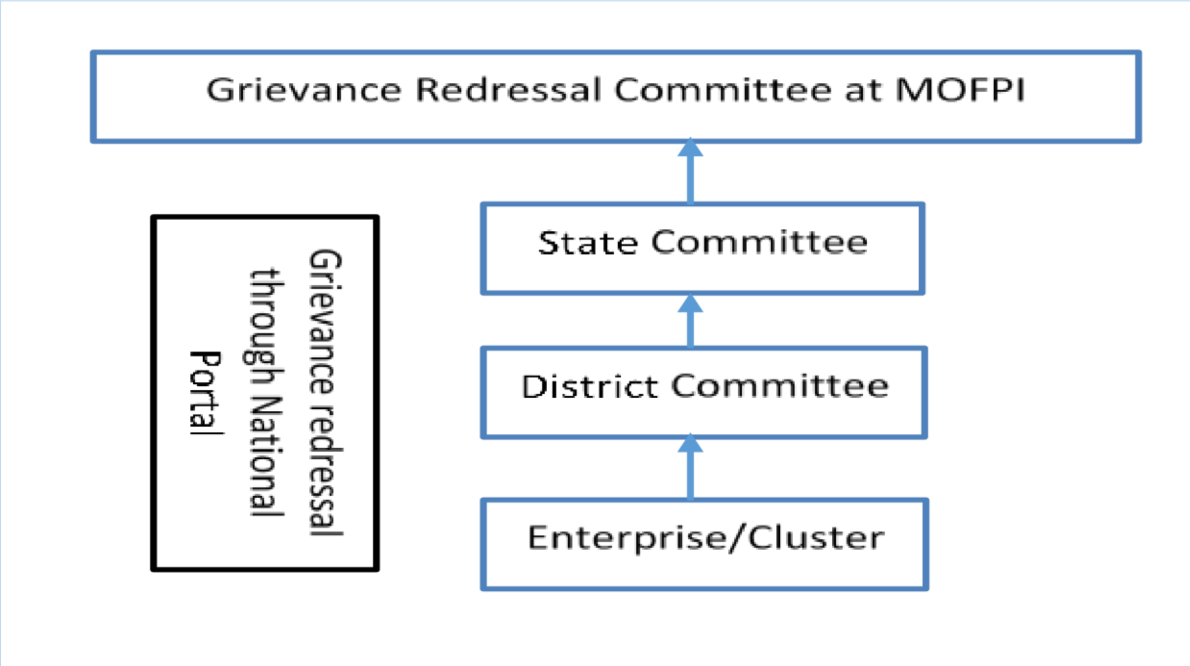


Figure 10: Proposed grievance redressal mechanism

The mechanisms for grievance redress for IFPVAP would be established at three levels namely district level, state level and at national level and at each level the project management unit will be supported by grievance redressal cell (GRC) who will be the point of contact for all the grievance related activities. For each grievance which is received, a unique tracking number will be issued which will help the complainant in tracking his or her grievance and this number will be used as a reference number for all future communication.

6.2.1. District level:

The District Nodal Agency (DNA) will be the first point of contact for handling grievances at the district level supported by GRC. The grievance can be lodged online using the national portal as well as directly registering the compliant with GRC using IFPVAP mobile portal or physically going to district, state or national level GRC's. In addition, to the mobile application a toll free number will also be provided for registering the grievance.

The GRC for this purpose would be headed by a District Collector/ Magistrate and the committee would be responsible for maintaining a register to record the number of grievances received, details of the discussion held, and the minutes of the meeting. They would also share a copy of the grievance status with the DNA .It is mandatory for the approached authority to share the documents with DPMU, independent of the grievance status.

6.2.2. State Level:

If the appellant is not satisfied with the resolution provided at the DNA, he/she would approach the next level which is the State Project Implementation Unit (PIU). The GRC will be headed by Secretary Food Processing/Industries/MSME. The PIU will provide resolution through appropriate liaising with relevant departments. The committee would maintain a register to record the number of grievances received along with details of the discussions and meetings held. If the PIU fails to satisfy the appellant with the grievance resolution, then GRC at this level will send the issue/grievance to the National level.

6.2.3. National Level:

If the complaint cannot be resolved at the state level, it would be referred to the National Project Management Unit headed by an Ombudsman to handle the grievances. This Ombudsman would head the GRC of IFPVAP and will also review the grievance records on quarterly basis for district and state level GRC's. If this GRC fail to satisfy the appellant with the grievance solution, then Ombudsman in discussion with the project advisory committee and project director would decide whether to send the issue/grievance to the Court of Law. In addition, the GRC at this level will prepare annual report on the grievances handled for the overall program and will share the same with the project director for his review.

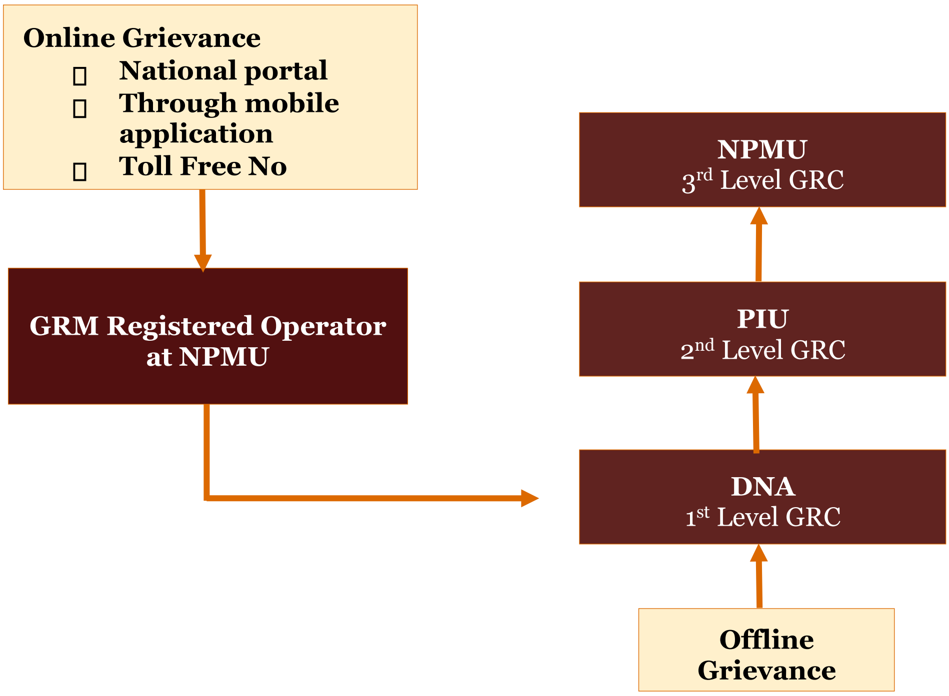


Figure 11: Proposed Grievance mechanism for implementation of EMF

6.2.4. Court of Law

This would include the District Commissioner and Legal courts. If the issue cannot be addressed or is outside the purview of the GRC, then it may be taken by the Office of the District Commissioner or a Legal Court.

6.2.5. World Bank Grievance Redress System

In addition to seeking to resolve their grievances through the GRM established at the government level, "communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may also submit complaints to the Grievance Redress Service (GRS) established by the World Bank. The

GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may also submit their complaint to the WB's independent Inspection Panel, after having brought the complaint to the World Bank's attention through its GRS. Information on how to submit complaints to the World Bank's Grievance Redress Service is available at http://www.worldbank.org/grs. Information on how to submit complaints to the World Bank Inspection Panel is available at www.inspectionpanel.org.

6.3. Training requirement & Schedule

x. Following are some of the trainings recommended for the successful implementation of the programme at the grass root level. In case there are additional training requirements at the State or the District level, the State Nodal Agency can identify and request for additional training to oversee the successful implementation of the programme.

Table 53 – Training requirement and schedule

S No	***Task***	***Topics***	***Responsibility***	***Frequency***
A	***National Level Capacity Building***			
1	National Mission Directorate	• Training on World Bank safeguard policies • Environmental regulatory requirement for the food processing sector • Health & safety regulatory requirement for the food processing sector • Food safety and hygiene regulatory requirement for the food processing sector	□ National Resource Institutes □ MoFPI □ Dept. of FSSAI, Pollution Control Board & DIC □ External trainers as required	Yearly
2	National Programme Management Unit			
B	***State Level Capacity Building***			
3	State Nodal Agency	• Training on World Bank safeguard policies • Environmental regulatory requirement for the food processing sector • Health & safety regulatory requirement for the food processing sector • Food safety and hygiene regulatory requirement for the food processing sector • Environmental Impact Assessment • Implementation of the Environmental Management Plan	□ State Resource Institutes □ Nodal Agency □ Dept. of FSSAI, Pollution Control Board & DIC □ External trainers as required	Yearly
4	State Programme Implementation Unit			
C	***District Level Capacity Building***		□	

5	District Industries Centre/ DRDA and other similar departments	• Training on World Bank safeguard policies • Environmental regulatory requirement for the food processing sector • Health & safety regulatory requirement for the food processing sector • Food safety and hygiene regulatory requirement for the food processing sector • Environmental Impact Assessment • Implementation of the Environmental Management Plan	State Resource Institutes Nodal Agency Dept. of FSSAI, Pollution Control Board & DIC External trainers as required	Half-yearly

Environmental Assessment and Environmental Management Framework for IFPVAP

Gram Samridhi Yojana

16 July 2019 (Volume-2: Annexures)

Draft

Volume 2: Annexures

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Glossary

%	Percentage
°C	Degree Celsius
AFI	Apex Financial Institution
APPCB	Andhra Pradesh Pollution Control Board
APDDCF	Andhra Pradesh Dairy Development Cooperative Federation
ATMA	Agricultural Technology Management Agency
BMC's	Bulk Milk Cooling
BMMU's	Block Mission Management Units
BOD	Biochemical Oxygen Demand
CFSFPU	Credit Fund for Small Scale Food Processing Units
CGTMSE	Credit Guarantee Fund Trust for Micro and Small Enterprises
CGWA	Central Ground Water Authority
CII	Confederation of Indian Industry

CPCB	Central Pollution Control Board
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
CRZ	Coastal Regulatory Zones
CTE	Consent to Establish
CTO	Consent to Operate
DAY - NRLM	Deendayal Antyodaya Yojana
DB	Decibel
DG	Diesel Generator
DGET	Directorate General of Employment and Training
DIC	District Industries Centre
DMMU's	District Mission Management Units
EA	Environment Assessment
EC	Empowered Committee
EHS	Environment, Health, Safety
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environment Management Plan
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization

FBO	Food Business Operators
FPO	Farmer Producer Organization
FPI	Food Processing Industry
FSMS	Food Safety Management System
FSSAI	Food Safety and Standards Authority of India
F&V	Fruits and Vegetables
GDP	Gross Domestic Product
GHP	Good Hygienic Practices
GHG	Greenhouse Gas
gm	Gram
GMP	Good Manufacturing Practices
GoI	Government of India
HACCP	Hazard Analysis and Critical Control Point
HC (emissions)	Hydrocarbons
IFC	International Finance Corporation
IIFPT	Indian Institute of Food Processing Technology
MoFPI	Ministry of Food Processing Industries
IFPVAP	India Food Processing and Value Addition Program
IPM	Integrated Pest Management
KL	Kilolitre
KLD	Kilolitre Per Day
LPG	Liquefied Petroleum Gas
MILKFED	Punjab State Cooperative Milk Producers' Federation Ltd
MoEFCC	Ministry of Environment, Forest and Climate Change
MoFPI	Ministry of Food Processing Industries
MPCB	Maharashtra Pollution Control Board

MoRD	Ministry of Rural Development
MSEs	Micro- and Small-Scale Food Processing Enterprises
MSME	Micro Small Medium Enterprises
M&E	Monitoring and Evaluation
MT	Million tons
MTD	Million tons per day
NIFTEM	National Institute of Food Technology Entrepreneurship and Management
NOC	No Objection Certificate
NOx NO2	Nitrogen Oxides Nitrogen Dioxide
NPA	Non-performing Asset
NPOP	National Program for Organic Production
NRLM	National Rural Livelihoods Mission
NRLPs	National Rural Livelihoods Promotional Society
OY	Oil Year
PAP	Project Affected People
PCB	Pollution Control Board
PDO	Project Development Objective
PGS	Participatory Guarantee System
PIU	Project Implementation Unit
PLI's	Primary Lending Institutions
PM	Particulate Matter
PMKSY	Pradhan Mantri Kisan Sampada Yojana
PMP	Pest Management Plan
PMU	Project Management Unit
PPCB	Punjab Pollution Control Board
PPE	Personal Protective Equipment

PUC	Pollution Under Control Certificate
R&D	Research & Development
SHG's	Self Help Groups
SME's	Small – Medium Enterprises
SSMU's	State Mission Management Units
SNF	Solids – No - Fats
SPCB	State Pollution Control Board
SPI	Seriously Polluting Industries
SPMU	State Program Management Unit
SOP's	Standard Operating Procedures
SO2	Sulphur Dioxide
SRLM's	State Rural Livelihoods Missions
SSUPs	Strategic State Upgradation Plans
TDS	Total Dissolved Solid
TPD	Tons Per Day
TSS	Total Suspended Solid
UPPCB	Uttar Pradesh Pollution Control Board
USDA	United States Department of Agriculture
UNIDO	United Nations Industrial Development Organization
VADP	Value Added Dairy Products
VOC	Volatile Organic Compounds
WHO	World Health Organization

1. Major food processing clusters in shortlisted states

1.1. Profile of shortlisted states in terms of food production and processing clusters

i. The Indian food sector has emerged as a high-growth sector. India is recognised as the largest producer of dairy (including milk, ghee, etc.), buffalo meat, and several fruits such as bananas, papayas, mangoes and guavas globally. It is also the second largest producer of several other fruits & vegetables, and the third largest producer of broiler meat. India's natural food production advantage, coupled with the growing consumer expenditure and demand for food in the country, has created vast potential for food processing industry.

ii. The profile of each of the four states (which have been studied in this report), in terms of food production and processing capability is described below (information is collated from various publications by MoFPI):

Table 1 – Food production and processing profile for the state of Andhra Pradesh

A) Andhra Pradesh		
• Andhra Pradesh is one of the leading food grain producing states in India, as well as one of the top rice producing states • Andhra Pradesh became the largest producer of eggs in 2017-18 • The state is a top producer of Chillies, Cocoa, Lime, Oil, Palm, Papaya, Coconut and Tomato followed by Cashew, Mango, Turmeric and Sweet Orange in India • The State has emerged as the "Fruit Basket" of the country with highest production of fruits • State has emerged as the largest producer of Spices in the Country • It has the largest number of registered Micro, Small and Medium Enterprises (MSMEs) in India (2015-16)		
List of key production clusters		
S No	**Category**	**Prominent Districts**
1.	Banana	Vizianagaram, Kadapa, Anantpur, Kurnool, West Godavari
2.	Rice	Guntur, Anantpur, East Godavari, West Godavari, Krishna
3.	Sweet Orange	Prakasm, Kurnool, Kadapa, Anantpur
4.	Okra	Krishna, Kurnool, Anantpur, Chittoor, Kadapa
5.	Turmeric	Visakhapatanam, Krishna, Guntur, Kurnool
6.	Livestock	Guntur, Prakasm, Krishna, Chittoor
7.	Sorghum(Jowar)	Prakasm, Kurnool, Kadapa, Guntur
8.	Tomato	Guntur, Kurnool, Kadapa, Anantpur, Chittoor
List of key processing clusters		
1.	Spices and Condiments Processing	Guntur, Kadapa, Prakasm, Kurnool
2.	Rice Mills	Nellore, West Godavari, Krishna, East Godavari
3.	Pulses Processing	Kadapa, Anantpur, Kurnool

4.	Bakery Products	Krishna, West Godavari, Nellore
5.	Mango Jelly Cluster	East Godavari, Vizianagaram, West Godavari, Krishna
6.	Edible oils processing	East Godavari, West Godavari, Kurnool, Nellore
7.	Turmeric Processing cluster	Guntur, Prakasham, Kadapa, Krishna
8.	Meat Processing	Krishna, Anantapur, Prakasham East Godavari
9.	Fish & Fishery Products	East Godavari, West Godavari Krishna, Nellore
10.	Fruits Processing	Chittoor, Krishna, Kadapa

Table 2 – Food production and processing profile for the state of Maharashtra

B) Maharashtra		
• Maharashtra is the largest producer of onion and tomatoes in India • It is also largest producer of certain fruits such as grapes and pomegranate • The state has 9 agro climatic zones to promote cultivation of fruits and vegetables all around the year		
List of key production clusters		
S No	**Category**	**Prominent Districts**
1.	Pomegranate	Nashik, Jalna, Ahmednagar, Pune
2.	Pigeon Pea	Latur, Akola, Buldhana, Amravati, Nanded
3.	Papaya	Nandurbar, Dhule, Akola, Jalgaon
4.	Onion	Jalgaon, Nashik, Aurangabad, Ahmednagar
5.	Milk	Pune, Satara, Sangli, Kolhapur, Sholapur, Osmanabad, Nashik
6.	Banana	Akola, Jalgaon, Nanded, Pune
7.	Fisheries	Thane, Raigarh, Ratnagiri, Sindhudurg
8.	Grapes	Nashik , Ahmednagar, Pune, Satara, Solapur and Osmanabad

List of key processing clusters		
1.	Chili Powder Processing	Dhule, Pune, Kohlapur
2.	Beverages	Nashik, Raigad, Solapur
3.	Sugar Processing from Jaggery	Kohlapur, Pune, Satara
4.	Fruits Processing	Pune, Aurangabad
5.	Bakery Products	Greater Mumbai, Jalgaon, Jalna
6.	Pulses Processing	Nagpur, Jalgaon
7.	Rice Mills	Gondia, Gadchiroli
8.	Prepared Foods	Dhule, Beed

Table 3 – Food production and processing profile for the state of Punjab

C) Punjab

- Punjab is known as the food bowl of India and is the largest producer of fruits and vegetables
- Punjab is the second largest producer of peaches and pear in India
- Third largest producer of paddy, wheat, carrot peas and radish

List of key production clusters

S No	Category	Prominent Districts
1.	Wheat	Amritsar, Tarn Taran, Kapurthala, Jalandhar, Gurdaspur, Hoshiarpur, SBS Nagar, Rupnagar, SAS Nagar, Patiala, Sangrur, Ludhiana
2.	Paddy	Kapurthala, Fatehgarh Sahib, Jalandhar, Gurdaspur, Hoshiarpur, Moga, Faridkot, Muktsar, Bathinda
3.	Barley	Amritsar, Hoshiarpur, Fazilka, Ludhiana
4.	Potato	Amritsar, Hoshiarpur, Jalandhar, Ludhiana
5.	Sweet Orange/ Kinnow	Sangrur, Barnala, Muktsar, Bathinda, Mansa, Ferozepur
6.	Cauliflower	Amritsar, Hoshiarpur, Jalandhar, Fazilka

7.	Sugarcane	Gurdaspur, Kapurthala, SBS Nagar, Rupnagar, Patiala
8.	Honey	Amritsar, Hoshiarpur, Jalandhar, Fazilka
9.	Milk	Ludhiana, Amritsar, Taran, Taran, Sangaur, Gurdaspur, Moga, SBS Nagar, Kapurthala, Jalandhar, Fatehgarh Sahab
List of key processing clusters		
1.	Rice Mills	Amritsar, Ludhiana, Patiala, Sangnur, Batala, Ferozpur, Kapurthala
2.	Fruits & Vegetables Processing	Amritsar, Jalandhar, Ludhiana, Patiala, Rupnagar, Sangrur
3.	Milk Processing	Ludhiana, Jalandhar, Moga, Patiala, Sangnur, Fatehpur Sahab
4.	Meat Processing	Barnala, Jalandhar
5.	Kinnow/ Sweet Orange	Fazilka, Hoshiarpur
6.	Snacks Processing	Moga, Patiala, Sangnur
7.	Potato Processing	Fatehgarh Sahib, Hoshiarpur, Jalandhar, Ludhiana, Sangrur

Table 4 – Food production and processing profile for the state of Uttar Pradesh

D) Uttar Pradesh

- Uttar Pradesh is one of the major producers of horticultural crops and food grains in India
- Uttar Pradesh is known as highest producer of Mango, Potato, Peas, Gooseberry, Watermelon and Wheat in India. It is ranked highest in terms of production of food grains, fruits and vegetables (2015-16) and production of milk, meat and sugarcane (2015-16)
- It has the 3rd largest number of registered Micro, Small and Medium Enterprises (MSMEs) in India (2015-16)

List of key production clusters

S No	Category	Prominent Districts
1.	Wheat	Hardoi, Aligarh, Budaun, Bulandshahar, Shahjahanpur, Azamgarh
2.	Rice	Shahjahanpur, Barabanki, Kheri, Siddharth Nagar

3.	Bajra	Agra, Budaun, Aligarh, Firozabad, Kasganj
4.	Mango	Lucknow, Saharanpur, Unnao
5.	Banana	Gorakhpur, Kushi Nagar, Fatehpur, Kaushambi, Maharajganj, Barabanki
6.	Milk	Bulandshahr, Etah, Meerut, Agra, Aligarh
7.	Watermelon	Aligarh, Firozabad, Etah, Farukkhabad, Kasganj
8.	Potato	Agra, Hathras, Firozabad, Kannauj, Aligarh
9.	Peas	Jalaun, Lalitpur, Jhansi
10.	Tomato	Mainpuri, Agra, Etah, Barabanki, Unnao
11.	Guava	Budaun, Kasganj, Aligarh, Farukkhabad, Hathras
12.	Eggs	Lucknow, Kanpur Nagar, Maharajganj, Saharanpur
List of key processing clusters		
1.	Fruits & vegetables	Agra, Bareilly, Gautam Buddha Nagar, Lucknow, Muzaffar Nagar

2.	Oil milling	Agra, Bareilly, Firozabad, Ghaziabad, Mathura, Muzaffarnagar
3.	Flour milling	Bahraich, Mathura, Meerut, Allahabad
4.	Pulse milling	Bareilly, Agra, Lucknow
5.	Milk & dairy	Agra, Mathura, Allahabad, Bareilly, Kanpur nagar, Lucknow
6.	Poultry	Aligarh, Kanpur, Muradabad, Gautam Buddha Nagar
7.	Rice milling	Barabanki, Rampur, Pilibhit, Shahjahanpur, Faizabad
8.	Vegetable oil	Aligarh, Mathura, Sambhal, Lucknow

1.2. Spread of Units (Micro) and key FSSAI and environmental compliance requirements

1.2.1. Dairy Products (Fresh and Value Added Dairy Products- VADP)

iii. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 5 – Spread of Micro units across India for dairy processing as per FSSAI List

S No	Particular	India		
		Central	State	Registration
1	Collection Centers	0	478	1825
2	Dairy processors	4714	18824	30830
3	Retailers	6	29	15
4	Transporters	0	1	54

5	Total	*4720*	*19332*	*32724*

Table 6 - Spread of Micro units across the selected districts of Punjab for dairy processing as per FSSAI List

S No	Particular	Punjab					
		Sangrur			Moga		
		Central	State	Registration	Central	State	Registration
1	Collection Centers	0	1	0	0	17	15
2	Dairy processors	0	66	101	15	70	328
3	Retailers	0	0	0	0	3	0
4	Transporters	0	0	0	0	0	0
5	Total	*0*	*67*	*101*	*15*	*90*	*343*

Table 7 - Spread of Micro units across the selected districts of Uttar Pradesh for dairy processing as per FSSAI List

S. No	Particular	Uttar Pradesh					
		Aligarh			Fatehpur		
		Central	State	Registration	Central	State	Registration
1	Collection Centers	0	1	0	0	0	0
2	Dairy processors	37	106	283	4	33	21
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	Total	*37*	*107*	*283*	*4*	*33*	*21*

Table 8 - Spread of Micro units across the selected districts of Maharashtra for dairy processing as per FSSAI List

S. No	Particular	Maharashtra					
		Nashik			Washim		
		Central	State	Registration	Central	State	Registration
1	Collection Centers	0	63	48	0	0	0
2	Dairy processors	34	264	299	0	6	13
3	Retailers	2	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	Total	*36*	*327*	*347*	*0*	*6*	*13*

Table 9 - Spread of Micro units across the selected districts of Andhra Pradesh for dairy processing as per FSSAI List

S. No	Particular	Andhra Pradesh					
		Vizianagaram			Prakasam		
		Central	State	Registration	Central	State	Registration
1	Collection Centers	0	0	0	0	0	0
2	Dairy processors	0	41	0	36	43	0
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	Total	*0*	*41*	*0*	*36*	*43*	*0*

iv. Similarly, the number of small and micro units associated with Dairy Industry as per registration data with DIC MSME (in shortlisted districts) is shared below:

Table 10 - Spread of Micro units across the selected districts of Punjab for dairy processing as per MSME List

S No	Particular	Punjab			
		Sangrur		Moga	
		Micro	Small	Micro	Small
1	Dairy processors	9	0	32	0
2	Milk/Ice-Cream Powder	2	0	4	0
3	Other dairy products	6	0	55	0
4	Ice Cream	0	0	1	0
5	Baby milk food	0	0	1	0
6	Pasteurized milk	0	0	0	0
7	*Total*	*17*	*0*	*93*	*0*

Table 11 - Spread of Micro units across the selected districts of Uttar Pradesh for dairy processing as per MSME List

S No	Particular	Uttar Pradesh			
		Aligarh		Fatehpur	
		Micro	Small	Micro	Small
1	Dairy processors	18	0	4	0
2	Milk/Ice-Cream Powder	8	1	2	0
3	Other dairy products	14	0	2	0
4	Ice Cream	19	0	5	0

5	Baby milk food	3	0	2	0
6	Pasteurized milk	32	1	3	0
7	*Total*	*94*	*2*	*18*	*0*

Table 12 - Spread of Micro units across the selected districts of Maharashtra for dairy processing as per MSME List

S No	Particular	Maharashtra			
		Nashik		Washim	
		Micro	Small	Micro	Small
1	Dairy processors	6	3	76	0
2	Milk/Ice-Cream Powder	0	1	2	0
3	Other dairy products	40	6	5	0
4	Ice Cream	5	5	1	0
5	Baby milk food	0	0	8	0
6	Pasteurized milk	16	2	4	0
7	*Total*	*67*	*17*	*96*	*0*

Table 13 - Spread of Micro units across the selected districts of Andhra Pradesh for dairy processing as per MSME List

S No	Particular	Andhra Pradesh			
		Vizianagaram		Prakasam	
		Micro	Small	Micro	Small
1	Dairy processors	0	1	0	1
2	Milk/Ice-Cream Powder	0	0	0	0
3	Other dairy products	0	0	0	0
4	Ice Cream	0	0	0	0
5	Baby milk food	0	0	0	0
6	Pasteurized milk	0	0	0	0
7	*Total*	*0*	*1*	*0*	*1*

Note: The AP Food Processing Society shared the details of the different units which are registered with them and the MSME Department

v. Out of the above, the following dairy product processing units have been covered as part of the primary field survey in shortlisted districts:

1.2.1.1. Key FSSAI and Environmental Compliance requirements for Dairy Industry

Table 14 – Key FSSAI requirements for the Dairy processing Industry

• FSSAI has documented and released food industry guide to implement good manufacturing practices and good hygiene practices requirements for milk and milk product industry in 2018, which is based on Part II &III of Schedule 4 of Food Safety & Standards (Licensing & Registration of Food Businesses) Regulation, 2011. • This guidance document is prepared with the intent to provide implementation guidance to food businesses (especially the small and medium businesses) involved in manufacturing/processing, packing, storage, distribution, retail and transportation of dairy products, to ensure that critical food safety related aspects are addressed throughout the supply chain. • It is applicable for food businesses involved in the Dairy sector which includes all milk and milk products: a) Liquid Milk b) UHT milk, condensed milk, fermented milk and flavoured milk c) Ghee, butter, cream d) Dairy Whitener (WMP & SMP) e) Curd, yoghurt, butter milk, paneer, cheese.	
Design of facilities and control of operations	Describes the requirements for location, surroundings, building design and layout, walls ceilings, floors, equipment and utilities. It also covers storage, processing, quality testing, transportation, distribution and recall.
Maintenance and sanitation of unit	Describes the requirements for cleaning and sanitation program, animal and pest control, drainage and waste disposal
Personal hygiene and employee facilities	Covers personal cleanliness and behaviour, work wear, grooming and visitor control
Other Aspects	Other aspects include Sub-contracting of dairy products, detailed stepwise recommendatory guidelines for implementation of Hazard Analysis and Critical Control Point (HACCP) system by FBOs, an inspection checklist for FBOs to audit their operations, mandatory and recommendatory formats.
A note on Analogue dairy products	• An analogue dairy product is made up of milk solids and vegetable fat and is not considered a pure play dairy product. Analogous dairy products are cheaper than pure dairy products and therefore, consumers are buying these • The absence of labelling regulations that specifically point out the difference between dairy analogues and pure dairy products are missing at this point • Based on information derived from secondary research, food items such as cheese, paneer, ghee, butter and other value-added products are being sold under the garb of dairy products in India, when they are really analogues FSSAI has received representations and concerns around the issue of analogues and is in the process of formalizing the guidelines around the same

Food adulteration	• In 2011, FSSAI had conducted a quick survey of adulteration of milk through its regional offices. This quick survey suffered from several drawbacks that included lack of harmonized protocols for sample collection and analysis, testing done in un-accredited laboratories, lack of data on the sectoral details of organized and unorganized sector and types of milk (buffalo milk, cow milk, mixed-milk, toned-milk, double toned milk, standardized milk, full cream milk, etc.). The survey was based on 1791 samples and focused mainly on quality parameters rather than safety concerns. Only qualitative analysis was done and the survey did not include parameters related to contaminants. Another milk survey was attempted in 2016 through State food authorities. This survey also suffered from similar infirmities. • Subsequently, FSSAI undertook a large scale survey on safety and quality of milk in the country in 2018. On-the-spot qualitative analysis of milk was done to avoid any error and maintain traceability of sampling and analysis. An effort was made to identify hotspots for possible contaminants / adulterants. Referred to as 'National Milk Quality Survey, 2018', this survey is by far the largest in terms of sample size (6432 samples qualitatively analysed) and largest numbers of parameters (4 quality parameters, Fat, SNF, Protein and added water; 12 adulterants; and 4 contaminants – antibiotics, pesticides, Aflatoxin M1 and Ammonium Sulphate). • The survey panned 29 states and 7 union territories covering almost all major towns with population of >50,000 and a sample size of 6432 analysed qualitatively for 2 quality parameters (fat & SNF), 13 adulterants (vegetable oil/fat, detergents/caustic soda, hydrogen peroxide, sugar, glucose, urea, starch, Maltodextrin, boric acid, ammonium sulphate, nitrates, cellulose, and neutralizer) &3 contaminants (pesticides, aflatoxin M1 & antibiotic residues). Nearly 30% of the samples that failed for safety parameters were analysed quantitatively in the laboratory. The survey was conducted over a period of about Six months from 7 May to 31 Oct 2018. The outcomes of survey are reflected below: • Milk in India is largely free from adulterants that render it unsafe for consumption. The survey shows that merely 12 (out of a total of 6,432) samples had adulterants that affect the safety of milk. • 10 percent of the samples had contaminants that make milk unsafe for consumption, as they have traces of pesticides, antibiotics, Aflatoxin, ammonium sulphate etc.
	• Other non-compliance on quality issues revealed that as many as 1261 (19.6%) of the samples did not meet standards of fat and 2165 (33.7%) of the samples did not meet standards of solid non-fat. Non-compliance on Fat and SNF quality parameters is higher in raw milk than in processed milk and is common across all states. This hints at the dilution of milk with water and hence the quality if input water is essential to be tested. • During the review of units at the time of field survey, we have not observed any evidence leading to adulteration of milk or milk products however dilution of milk with water is a phenomenon which is quite commonly undertaken.

vi. Key environmental requirements for dairy industry

Table 15 – Key environmental requirements for the Dairy processing Industry

• Ministry of Environment, Forest and Climate Change (MoEFCC), GoI, has notified milk processing and dairy plants as one of the 33 industries which are categorized as Seriously Polluting Industries (SPI) due to their water pollution potential. (This list is approved by Principal Committee constituted by National Green Tribunal dated 17.11.2014). • In March 2016, MoEFCC has released 'Re-Categorization of Industries based on their pollution load. • As per the re-categorization, Milk and Dairy products industry (integrated) is considered as Red Category and small scale dairy and dairy products industry is considered as Orange Category (considering they are "water and air polluting both") •	
Consent to operate	It is obligatory for the industries to obtain consent to operate from respective State Pollution Control Board
Installation of ETP	It is obligatory for the industries to install effluent treatment plants and comply with the effluent discharge standards set by CPCB.

Effluent Discharge Standards	<table><tr><td>Parameter</td><td>Concentration not to exceed in mg/l, except pH</td><td>Quantum per processed</td></tr><tr><td>pH</td><td>6.5 – 8.5</td><td></td></tr><tr><td>*BOD at 27^{0}C, 3 days</td><td>100</td><td></td></tr><tr><td>**Suspended solids</td><td>150</td><td></td></tr><tr><td>Oil and grease</td><td>10</td><td></td></tr><tr><td>Wastewater generation</td><td>-</td><td>3m^3/kl of milk</td></tr><tr><td></td><td></td><td></td></tr></table>

1.2.2. Fruits and Vegetables based processed products

vii. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 16 – Spread of Micro units across India for Fruits & Vegetables processing as per FSSAI list

S No	Particular	India		
		Central	State	Registration
1	Fruits processors	2199	5192	242
2	Vegetable processors	1298	2684	5239
3	Retailers	11	80	6
4	Transporters	0	3	1
5	*Total*	*3508*	*7959*	*5488*

Table 17 – Spread of Micro units across the selected districts of Punjab for Fruits & Vegetables processing as per FSSAI list

S No	Particular	Punjab					
		Sangrur			Moga		
		Central	State	Registration	Central	State	Registration
1	Fruits processors	1	3	0	0	0	2
2	Vegetable processors	2	4	3	1	0	3
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	Total	*3*	*7*	*3*	*1*	*0*	*5*

Table 18 – Spread of Micro units across the selected districts of Uttar Pradesh for Fruits & Vegetables processing as per FSSAI list

S No	Particular	Uttar Pradesh					
		Aligarh			Fatehpur		
		Central	State	Registration	Central	State	Registration
1	Fruits processors	2	0	0	0	2	0

2	Vegetable processors	2	3	1	0	1	3
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	Total	*4*	*3*	*1*	*0*	*3*	*3*

Table 19 – Spread of Micro units across the selected districts of Maharashtra for Fruits & Vegetables processing as per FSSAI list

S No	Particular	Maharashtra					
		Nashik			Washim		
		Central	State	Registration	Central	State	Registration
1	Fruits processors	87	44	0	0	1	0
2	Vegetable processors	29	41	24	0	0	4
3	Retailers	14	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	Total	*120*	*85*	*24*	*0*	*1*	*4*

Table 20 – Spread of Micro units across the selected districts of Andhra Pradesh for Fruits & Vegetables processing as per FSSAI list

S No	Particular	Andhra Pradesh					
		Vizianagaram			Prakasam		
		Central	State	Registration	Central	State	Registration
1	Fruits processors	0	12	0	0	9	0
2	Vegetable processors	0	4	0	0	1	1
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	Total	*0*	*16*	*0*	*0*	*10*	*1*

viii. Similarly, the number of small and micro units associated with Fruits and Vegetables Processing Industry as per MSME DIC list in the shortlisted districts is shared below:

Table 21 – Spread of Micro units across the selected districts of Punjab for Fruits & Vegetables processing as per MSME list

S No	Particular	Punjab	
		Sangrur	Moga

		Micro	Small	Micro	Small
1	Fruit or vegetable juices and their concentrates, squashes and powder	1	0	2	0
2	Manufacture of pickles, chutney etc.	2	0	0	0
3	Preservation of fruit and vegetables	2	0	2	0
4	Preserving in sugar of fruit, nuts, fruit peels and other parts of plants	0	0	1	0
5	Manufacture of potato flour & meals and prepared meals of vegetables	0	0	1	0
6	Canning of fruits and vegetables	0	0	0	0
7	Manufacture of sauces, jams, jellies and marmalades	0	0	0	0
8	Manufacture of 'gur' from sugarcane	0	0	0	0
9	*Total*	*5*	*0*	*6*	*0*

Table 22 – Spread of Micro units across the selected districts of Uttar Pradesh for Fruits & Vegetables processing as per MSME list

S. No	Particular	Uttar Pradesh			
		Aligarh		Fatehpur	
		Micro	Small	Micro	Small
1	Fruit or vegetable juices and their concentrates, squashes and powder	2	0	0	0
2	Manufacture of pickles, chutney etc.	1	0	0	0
3	Preservation of fruit and vegetables	0	0	5	2
4	Preserving in sugar of fruit, nuts, fruit peels and other parts of plants	2	0	0	0
5	Manufacture of potato flour & meals and prepared meals of vegetables	0	0	0	0
6	Canning of fruits and vegetables	1	0	1	0
7	Manufacture of sauces, jams, jellies and marmalades	1	0	2	0
8	Manufacture of 'gur' from sugarcane	0	0	0	0
9	*Total*	*7*	*0*	*8*	*2*

Table 23 – Spread of Micro units across the selected districts of Maharashtra for Fruits & Vegetables processing as per MSME list

S No	Particular	Maharashtra			
		Nashik		Washim	
		Micro	Small	Micro	Small
1	Fruit or vegetable juices and their concentrates, squashes and powder	18	11	2	0
2	Manufacture of pickles, chutney etc.	0	0	1	0
3	Preservation of fruit and vegetables	78	8	2	0

4	Preserving in sugar of fruit, nuts, fruit peels and other parts of plants	3	0	0	0
5	Manufacture of potato flour & meals and prepared meals of vegetables	2	1	3	0
6	Canning of fruits and vegetables	8	0	2	0
7	Manufacture of sauces, jams, jellies and marmalades	11	1	1	0
8	Manufacture of 'gur' from sugarcane	1	0	0	0
9	*Total*	*121*	*21*	*11*	*0*

Table 24 – Spread of Micro units across the selected districts of Andhra Pradesh for Fruits & Vegetables processing as per MSME list

S No	Particular	Andhra Pradesh			
		Vizianagaram		Prakasam	
		Micro	Small	Micro	Small
1	Fruit or vegetable juices and their concentrates, squashes and powder	0	0	0	0
2	Manufacture of pickles, chutney etc.	0	0	0	0
3	Preservation of fruit and vegetables	0	0	0	1
4	Preserving in sugar of fruit, nuts, fruit peels and other parts of plants	0	0	0	0
5	Manufacture of potato flour & meals and prepared meals of vegetables	0	0	0	0
6	Canning of fruits and vegetables	0	0	0	0
7	Manufacture of sauces, jams, jellies and marmalades	0	0	0	0
8	Manufacture of 'gur' from sugarcane	0	0	0	0
9	*Total*	*0*	*0*	*0*	*1*

Note: The AP Food Processing Society shared the details of the different units which are registered with them and the MSME Department

1.2.2.1. Key FSSAI and Environmental Compliance requirements for Fruits and Vegetables Products Industry

ix. Key requirements of FSSAI for Fruits and Vegetables Products Industry

Table 25 – Key FSSAI requirements for the Fruits & Vegetable processsing industry

	• FSSAI has documented and released food industry guide to implement good manufacturing practices and good hygiene practices requirements for Fruits and Vegetables industry in March 2019, which is based on Part II & III of Schedule 4 of Food Safety & Standards (Licensing & Registration of Food Businesses) Regulation, 2011 • This guidance document is prepared with the intent to provide implementation guidance to food businesses (especially the small and medium businesses) involved in manufacturing/processing, packing, storage, distribution, retail and transportation of fruits and vegetables products, to ensure that critical food safety related aspects are addressed throughout the supply chain • This document have also made wide reference to Codex codes of hygienic practices for dried fruits, dehydrated fruits and vegetables, canned fruit and vegetable products and was developed into single user friendly document for the industry • It applies to Juices, Dried or Dehydrated, aseptically processed, Canned/bottled, Frozen and Minimally processed products manufacturing industry
Design of facilities and control of operations	Describes the requirements for location, surroundings, building design and layout, walls ceilings, floors, equipment and utilities. It also covers storage, processing, quality testing, transportation, distribution and recall
Maintenance and sanitation of unit	Describes the requirements for cleaning and sanitation program, animal and pest control, drainage and waste disposal

Personal hygiene and employee facilities	Covers personal cleanliness and behaviour, work wear, grooming and visitor control
Other Aspects	Other aspects include Sub-contracting of dairy products, detailed stepwise recommendatory guidelines for implementation of Hazard Analysis and Critical Control Point (HACCP) system by FBOs, an inspection checklist for FBOs to audit their operations, mandatory and recommendatory formats
A note on Microbiological standards by FSSAI	• On March 21, 2018, the Food Safety and Standards Authority of India (FSSAI) published the microbiological standards for fruits and vegetables and their products, to be implemented from January 1, 2019 • The standard covers: o Fresh: The whole fruits and vegetables that are sold fresh, o Cut or minimally processed and packaged including juices: Fruits and vegetables which are washed or sanitized or peeled or cut up and made in to juice and packed. o Fermented or pickled or acidified or with preservatives: Fruits and vegetables including their products which are preserved using living ferments such as yeast, bacterium, mold, enzyme or in brine to produce lactic acid or marinating and storing it in an acid solution, usually vinegar (acetic acid), salt and sugar and edible vegetable oil. o Pasteurized Juices: Fruit and vegetable juices that are subjected to pasteurization to destroy or inactivate harmful microorganisms o Carbonated fruit beverages (and fruit drinks): Any beverage or drink which is prepared from fruit juice and water, or carbonated water and containing sugar, dextrose, invert sugar or liquid glucose either in single or in combination which may contain peel oil and fruit essences. It may also contain any other ingredients appropriate to the products o Frozen: Fruits and vegetables including their products which are subjected to a freezing process and maintained at temperature of -18oC

Fruit traders are directed to avoid stickers to prevent contamination	• FSSAI has asked the fruit and vegetable traders to avoid putting stickers on them, as it could lead to contamination of the food product • FSSAI has released a guidance note in 2018, that the stickers in Indian context were only used to either hide any decay or the brand name, which is contrary to the stickers' use in the developed world, wherein they consisted of information about traceability, grades, prices, etc. In India the traders use the stickers to make their product look premium, and sometimes hide the decay or defect the product. Brand name, tested OK or best quality are some common terms mentioned on stickers, which do not have any significance

x. Key environmental requirements for fruits and vegetable processing industry

Table 26 – Key environmetnal requirements for the Fruits & Vegetable processsing industry

- In March 2016, MoEFCC has released 'Re - Categorization of Industries based on their pollution load.
- As per the re-categorization, Food and food processing including fruits and vegetable processing is considered as Orange Category (considering they are "Normal water and air pollution")
- Key requirements of CPCB which are applicable on small scale F&V industry are described below

Consent to operate	It is obligatory for the industries to obtain consent to operate from respective State Pollution Control Board
Installation of ETP	It is obligatory for the industries to install effluent treatment plants and comply with the effluent discharge standards set by CPCB.

Effluent Discharge Standards

Parameter	Effluent	Concentration not to exceed - mg/l except pH	Quantum gm/MT of product
Above 0.4 MT /Day	pH	6.5 - 8.5	-
	Suspended Solids	100	-
	Oil and Grease	10	-
	BOD [3Days at 27°C]	30	-
Synthetic (less than 0.4 MT/Day)		Disposal via septic Tank	-

1.2.3. Grains and oilseeds based processed products

xi. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 27 – Spread of Micro units across India for Grains & Oilseed processing as per FSSAI list

S No	Particular	India		
		Central	State	Registration
1	Processors	574	15665	675
2	Retailers	8	17	0
3	Transporters	2	10	0

4	*Total*	*584*	*15692*	*675*

Table 28 – Spread of Micro units across the selected districts of Punjab for Grains & Oilseed processing as per FSSAI list

S No	Particular	Punjab					
		Sangrur			Moga		
		Central	State	Registration	Central	State	Registration
1	Processors	2	22	1	1	0	0
2	Retailers	0	0	0	0	0	0
3	Transporters	0	0	0	0	0	0
4	*Total*	*2*	*22*	*1*	*1*	*0*	*0*

Table 29 – Spread of Micro units across the selected districts of Uttar Pradesh for Grains & Oilseed processing as per FSSAI list

S No	Particular	Uttar Pradesh					
		Aligarh			Fatehpur		
		Central	State	Registration	Central	State	Registration
1	Processors	1	32	0	0	20	1
2	Retailers	0	0	0	0	0	0
3	Transporters	0	0	0	0	0	0
4	*Total*	*1*	*32*	*0*	*0*	*20*	*1*

Table 30 – Spread of Micro units across the selected districts of Maharashtra for Grains & Oilseed processing as per FSSAI list

S No	Particular	Maharashtra					
		Nashik			Washim		
		Central	State	Registration	Central	State	Registration
1	Processors	1	54	2	0	7	0
2	Retailers	0	0	0	0	0	0
3	Transporters	0	0	0	0	0	0
4	*Total*	*1*	*54*	*2*	*0*	*7*	*0*

Table 31 – Spread of Micro units across the selected districts of Andhra Pradesh for Grains & Oilseed processing as per FSSAI list

S No	Particular	Andhra Pradesh					
		Vizianagaram			Prakasam		
		Central	State	Registration	Central	State	Registration
1	Processors	0	5	0	0	105	0
2	Retailers	0	0	0	0	0	0
3	Transporters	0	0	0	0	0	0
4	*Total*	*0*	*5*	*0*	*0*	*105*	*0*

xii. Similarly, the number of small and micro units associated with Grains and Oilseeds processing Industry as per MSME DIC list in the shortlisted districts is shared below:

Table 32 – Spread of Micro units across the selected districts of Punjab for Grains & Oilseed processing as per MSME list

S No	Particular	Punjab			
		Sangrur		Moga	
		Micro	Small	Micro	Small
1	Flour milling	21	2	18	3
2	Grain milling other than wheat, rice and dal	3	0	2	0
3	Grinding and processing of spices	2	0	3	1
4	Other grain milling and processing n.e.c.	8	0	4	0
5	Rice milling	0	0	8	30
6	Flour mixes and prepared blended flour and dough for bread, cakes, biscuits	0	0	1	0
7	Dal (pulses) milling	0	0	0	0
8	Manufacture of cereal breakfast foods obtained by roasting or swelling cereal grains	0	0	0	0
9	*Total*	*34*	*2*	*36*	*34*

Table 33 – Spread of Micro units across the selected districts of Uttar Pradesh for Grains & Oilseed processing as per MSME list

S No	Particular	Uttar Pradesh			
		Aligarh		Fatehpur	
		Micro	Small	Micro	Small
1	Flour milling	10	0	93	3

2	Grain milling other than wheat, rice and dal	4	0	10	0
3	Grinding and processing of spices	6	0	9	0
4	Other grain milling and processing n.e.c.	2	0	12	0
5	Rice milling	2	1	16	10
6	Flour mixes and prepared blended flour and dough for bread, cakes, biscuits	1	0	0	0
7	Dal (pulses) milling	0	0	1	0
8	Manufacture of cereal breakfast foods obtained by roasting or swelling cereal grains	0	0	0	0
9	*Total*	*25*	*1*	*141*	*13*

Table 34 – Spread of Micro units across the selected districts of Maharashtra for Grains & Oilseed processing as per MSME list

S No	Particular	Maharashtra			
		Nashik		Washim	
		Micro	Small	Micro	Small
1	Flour milling	19	1	3	1
2	Grain milling other than wheat, rice and dal	20	6	1	0
3	Grinding and processing of spices	37	3	12	0
4	Other grain milling and processing n.e.c.	18	9	3	1
5	Rice milling	22	20	0	0
6	Flour mixes and prepared blended flour and dough for bread, cakes, biscuits	1	0	0	0
7	Dal (pulses) milling	7	3	9	5
8	Manufacture of cereal breakfast foods obtained by roasting or swelling cereal grains	6	1	0	0
9	*Total*	*130*	*43*	*28*	*7*

Table 35 – Spread of Micro units across the selected districts of Andhra Pradesh for Grains & Oilseed processing as per MSME list

S No	Particular	Andhra Pradesh			
		Vizianagaram		Prakasam	
		Micro	Small	Micro	Small
1	Flour milling	0	0	2	0
2	Grain milling other than wheat, rice and dal	1	0	0	0
3	Grinding and processing of spices	0	0	0	0
4	Other grain milling and processing n.e.c.	0	0	0	0
5	Rice milling	18	30	2	5
6	Flour mixes and prepared blended flour and dough for bread, cakes, biscuits	0	0	0	0
7	Dal (pulses) milling	1	3	0	0

8	Manufacture of cereal breakfast foods obtained by roasting or swelling cereal grains	0	0	0	0
9	*Total*	*20*	*33*	*4*	*5*

Note: The AP Food Processing Society shared the details of the different units which are registered with them and the MSME Department

xiii. Out of the above, the following grains, oilseeds processing and spice manufacturing processing and units have been covered as part of the primary field survey in shortlisted districts:

Table 36 – Coverage of enterprises for Grains & Oilseeds processing across different districts of the selected states for assessment

Type of Units	Punjab		Uttar Pradesh		Maharashtra		Andhra Pradesh	
Districts	Sangrur	Moga	Aligarh	Fatehpur	Nashik	Washim	Vizianagaram	Prakasam
Total covered	15	11	4	12	8	8	0	2
Rice/Flour/Oil Milling	8	7	4	10	6	3	0	1
Spices	4	4	0	2	2	5	0	1
Soya products	3	0	0	0	0	0	0	0

1.2.3.1. Key FSSAI and Environmental Compliance requirements for grains and oilseeds products Industry

xiv. Key aspects of Grains and oilseeds processing industries is described below:

Table 37 – Key aspects of the Grains & Oilseeds industry in India

S No	Understanding the grains and oilseeds supply chain models in India
1	• Approximately 90 percent of grains undergo primary processing, with wheat being the primary processed grain in India, largely used for wheat flour. Milling of rice and pulses makes up the remainder of the grain processing sector. Most grain processing is carried out in the unorganized or informal sector; however, some large players are active in the market and sell processed grains in branded retail packs. • The major actors in the rice and wheat value chains farmers/producers; a large number of intermediaries (including collectors, traders, commission agents, and brokers); wholesalers; processors (including rice and flour millers); and retailers. (FAO –Value chain of rice and wheat in Uttar Pradesh)
2	• Majority of farmers producing wheat and oilseeds have small land holding. Farmers store and sell their marketable surplus after each cropping season • This is followed by a spectrum of aggregators includes small collectors and larger traders dealing in quantities from 10kg to minimum shipments of 10 tons. Initial contact with farmers is made at the market, where a farmer brings a sample of product, or at the farm gate, where a collector travels to arrange a sale before harvest, based on existing community relationships • The processors which include only rice/ flour mill or combined mills including oil extraction process, purchase the raw material from the most efficient (availability and cost effectiveness) market source which is present in their vicinity • The grains are processed, sold loose or packaged with / without labelling, mainly to cater to the domestic consumption demand

xv. Key activities and process involved in processing of grains and oilseeds is described below:

Table 38 – Key activites and process invovled in the Grains & Oilseeds processing industry

Key process steps involved in production	- Grains are received and stored in a dry, pest free area. - The production quantity is run through separator machines to filter out physical contaminations - The cleaned product is then passed through a milling machine to produce flour of desired quantity. - For oilseeds, post cleaning and separation of physical contaminants, extraction machines are used for pressing of oil seeds mechanically/ with use of solvent to Extract Oil. - Extracted oil is then further refined by Degumming, Neutralization, Bleaching and Deodorization of Crude Oil, which is then filled into containers/ packets and sealed - For post-production of rice milling is a crucial step. The basic objective of a rice milling system is to remove the husk and the bran layers, and produce an edible, white rice kernel that is sufficiently milled and free of impurities. Depending on the requirements of the customer, the rice should have a minimum number of broken kernels - A rice milling system can be a simple one or two step process, or a multi stage process: ○ One step milling - husk and bran removal are done in one pass ○ Two step process - removing husk and removing bran are done separately ○ Multistage milling - can be done in the village or local consumption or commercially for marketing rice; rice undergoes a number of different processing steps, such as: ▪ Pre-cleaning ▪ Dehusking or dehulling ▪ Paddy separation ▪ Whitening or polishing ▪ Grading and separation of white rice ▪ Mixing ▪ Mist polishing ▪ Weighing of rice

xvi. Key environmental concerns of rice, grains and oilseed product processing units occur within the cultivation stage. However, processing also involves certain aspects which are described below (Source: IFC EHS guidelines for food and beverage, CPCB guidelines and other research articles)

Table 39 – Key Environmental concenrs in the Grains & Oilseeds processing industry

Key environmental issues in a rice mill	- Water utilized for soaking paddy, especially for parboiled rice production can result in water pollution and odor nuisance to local community - In rice milling unit wastewater is usually generated in the parboiling stages from the soaking operation, and boiler blow down. - Effluent produced during cleaning of equipment can cause water pollution through insufficient treatment of effluent - Air pollution both on site and in the surrounding locality may result from release of dust to the atmosphere from handling or processing of the paddy or its by-products - Generation of solid wastes, particularly unused rice husk and bran, as well as other wastes generated from the cleaning process - Raw materials and by-products may be subject to pest infestation and contamination (Birds contaminated with avian flu can leave their droppings in the rice mill) - Pollution risks to water and soil from spillage and leakage of fuels that maybe stored on site

Key concern for Flour and oil mill	Generation of solid wastes in large quantities needs to be handled efficiently. Most of the waste has a high dry organic content and has a potential to be used as a fuel / animal feed The main pollutant of concern in grain milling industrial units is the particulate matter emission generated from material handling, cleaning, milling and packing operations One of the key impacts of workers employed in rice or flour mills, is reduced lung efficiency due to excessive exposure to fine organic dust prevalent in the workplace environment. The impairment in lung efficiency was increased with duration of exposure in the flour mill workers

xvii. Key requirements of FSSAI for grains and oilseeds processing Industry:

Table 40 – Key FSSAI requirementsfor the Grains & Oilseeds processing industry

- FSSAI has documented and released food industry guide to implement good manufacturing practices and good hygiene practices requirements for Flour milling industry in November 2017, which is based on Part II &III of Schedule 4 of Food Safety & Standards (Licensing & Registration of Food Businesses) Regulation, 2011.
- This guidance document is prepared with the intent to provide implementation guidance to food businesses (especially the small and medium businesses) involved in manufacturing, packing, storage and transportation of Cereals and cereal products including grains flours, to ensure that critical food safety related aspects are addressed throughout the supply chain.
- The major activities in the milling industry covered under this document comprise of the following: a) Procurement of grains from Mandi b) Transportation of the grains c) Grain Storage and Handling d) Blending/Quality Verification e) Processing f) Packaging and Labelling g) Storage/Handling of finished product
- Similarly, FSSAI has also released food industry guide to implement good manufacturing practices and good hygiene practices requirements edible vegetable oils and fats in October 2017.
- The various types of Edible vegetable oils & fats covered under the document are: a) Raw/ Crude edible vegetable oils, b) Refined edible Vegetable oils, c) Blended edible Vegetable oils, d) Hydrogenated Vegetable fats and e) Bakery fats & Margarines
- Both these documents mainly covers the following aspects, amongst other areas:

Design of facilities and control of operations	Describes the requirements for location, surroundings, building design and layout, walls ceilings, floors, equipment and utilities. It also covers storage, processing, quality testing, transportation, distribution and recall.
Maintenance and sanitation of unit	Describes the requirements for cleaning and sanitation program, animal and pest control, drainage and waste disposal
Personal hygiene and employee facilities	Covers personal cleanliness and behaviour, work wear, grooming and visitor control
Other Aspects	Other aspects include Sub-contracting of grains and oilseed products, detailed stepwise recommendatory guidelines for implementation of Hazard Analysis and Critical Control Point (HACCP) system by FBOs, an inspection checklist for FBOs to audit their operations, mandatory and recommendatory formats

xviii. Key environmental requirements for grains and oilseeds processing industry:

Table 41 – Key environmental requirements for the Grains & Oilseeds processing industry

- In March 2016, MoEFCC has released ‘Re-Categorisation of Industries based on their pollution load
  As per the Re-categorization:
- Parboiled Rice Mills are classified as Orange category as Rice Mills are generating both air and water pollution are having high strength in respect of BOD (Note: Orange category is only applicable if waste water generation <100 KLD & fuel consumption less than 12 MTD else the units gets reassigned to red category)
- Dal Mills, facility of handling, storage and transportation of food grains in bulk, Flour Mills (Dry process), Oil Mill Ghani and extraction (No hydrogenation/ refining) and Rice mills (Rice hullers only) are categorized as green category based on fugitive dust emissions and emissions of PM during handling of grains as well as small quantities of floor washings & equipment washings are generated

Consent to operate	It is obligatory for the industries to obtain consent to operate from respective State Pollution Control Board
Installation of ETP	It is obligatory for the parboiled rice industries to install effluent treatment plants and comply with the effluent discharge standards set by CPCB

Emission and Effluent Discharge Standards

Emission standards:

	Capacity (tonne per hour)	Limiting Concentration in mg/Nm 3
Particulate matter	1 to 3	150
	More than 3	100

Note: (i) All dust generating equipment’s or processes shall be provided with dust extraction arrangement.

(ii) The bag houses etc., shall be connected to chimneys/stacks of 12 metres eight or at least 02 metres above the top most point of the building or shed or plant in the industry.

(iii) The unit shall channelize shop floor/fugitive emissions trough a stack of 12 metres height or at least 02 metres above the top point of the building or shed or plant in the industry,

Effluent standards

	Limiting value for concentration in mg/l, except for pH		
	Inland surface water	Public sewer	Land for irrigation
pH	5.5 – 9.0	5.5 – 9.0	5.5 – 9.0
Suspended solids	100	600	200
Oil & Grease	10	20	10
BOD 3 days at 27 degree C	30	350	100
COD	250	-	-

Stormwater Standards

(i) Stormwater for a unit (having plot size atleast 250 square meters) shall not be allowed to mix with scrubber water, effluent and/or floor washings.

(ii) Stormwater within the battery limits of a unit shall be channelized through separate drain/pipe passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall.

1.2.4. Packaged food items such as Bakery, snacks, papad etc.

xix. As per the latest FSSAI Registration data the spread of units which are registered with FSSAI across India and target states is given below:

Table 42 – Spread of Micro units across India for Packaged food items as per FSSAI list

S No	Particular	India		
		Central	State	Registration
1	Bakery	1732	24957	13153
2	Ready to eat snacks	1166	14540	13029
3	Retailers	45	582	13
4	Transporters	0	7	1
5	*Total*	*2943*	*40086*	*26196*

Table 43 – Spread of Micro units across the selected districts of Punjab for Packaged food items as per FSSAI list

S No	Particular	Punjab					
		Sangrur			Moga		
		Central	State	Registration	Central	State	Registration
1	Bakery	0	11	12	2	3	6
2	Ready to eat snacks	4	3	0	0	1	10
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	*Total*	*4*	*14*	*12*	*2*	*4*	*16*

Table 44 – Spread of Micro units across the selected districts of Uttar Pradesh for Packaged food items as per FSSAI list

S No	Particular	Uttar Pradesh					
		Aligarh			Fatehpur		
		Central	State	Registration	Central	State	Registration
1	Bakery	2	52	13	8	13	11
2	Ready to eat snacks	0	51	6	1	12	18
3	Retailers	0	0	0	0	0	0
4	Transporters	*0*	*0*	*0*	*0*	*0*	*0*
5	*Total*	*2*	*103*	*19*	*9*	*25*	*29*

Table 45 – Spread of Micro units across the selected districts of Maharashtra for Packaged food items as per FSSAI list

S No	Particular	Maharashtra					
		Nashik			Washim		
		Central	State	Registration	Central	State	Registration
1	Bakery	35	285	59	0	6	10
2	Ready to eat snacks	11	130	72	0	10	2
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	*Total*	*46*	*415*	*131*	*0*	*16*	*12*

Table 46 – Spread of Micro units across the selected districts of Andhra Pradesh for Packaged food items as per FSSAI list

S No	Particular	Andhra Pradesh					
		Vizianagaram			Prakasam		
		Central	State	Registration	Central	State	Registration
1	Bakery	0	9	0	0	13	1
2	Ready to eat snacks	0	2	0	0	5	0
3	Retailers	0	0	0	0	0	0
4	Transporters	0	0	0	0	0	0
5	*Total*	*0*	*11*	*0*	*0*	*18*	*1*

xx. Similarly, the number of small and micro units associated with Packaged Food Industry as per MSME DIC list in the shortlisted districts is shared below:

Table 47 – Spread of Micro units across the selected districts of Punjab for Packaged food items as per MSME list

S No	Particular	Punjab			
		Sangrur		Moga	
		Micro	Small	Micro	Small
1	Bakery	7	1	7	0
2	Manufacture of other bakery products n.e.c.	1	0	7	0
3	Manufacture of papads, appalam and similar food products	0	0	0	0
4	*Total*	*8*	*0*	*14*	*0*

Table 48 – Spread of Micro units across the selected districts of Uttar Pradesh for Packaged food items as per the MSME list

S No	Particular	Uttar Pradesh			
		Aligarh		Fatehpur	
		Micro	Small	Micro	Small
1	Bakery	6	0	9	3
2	Manufacture of other bakery products n.e.c.	2	0	6	0
3	Manufacture of papads, appalam and similar food products	1	0	2	1
4	*Total*	*9*	*1*	*17*	*4*

Table 49 – Spread of Micro units across the selected districts of Maharashtra for Packaged food items as per MSME list

S No	Particular	Maharashtra			
		Nashik		Washim	
		Micro	Small	Micro	Small
1	Bakery	24	3	6	0
2	Manufacture of other bakery products n.e.c.	23	1	4	1
3	Manufacture of papads, appalam and similar food products	190	5	13	0
4	*Total*	*237*	*9*	*23*	*1*

Table 50 – Spread of Micro units across the selected districts of Andhra Pradesh for Packaged food items as per MSME list

S No	Particular	Andhra Pradesh			
		Vizianagaram		Prakasam	
		Micro	Small	Micro	Small

1	Bakery	0	0	0	0
2	Manufacture of other bakery products n.e.c.	0	0	0	0
3	Manufacture of papads, appalam and similar food products	0	0	0	0
4	*Total*	*0*	*0*	*0*	*0*

Note: The AP Food Processing Society shared the details of the different units which are registered with them and the MSME Department

xxi. Out of the above, the following packaged food manufacturing units have been covered as part of the primary field survey in shortlisted districts:

1.2.4.1. Key FSSAI and Environmental Compliance requirements for packaged food Products Industry

xxii. Key environmental concerns in preparation of packaged food items include:

Table 51 – General characterisitcs and requirements of the Packaged food items industry in India

S No	Key processes
1	Key environmental and waste related aspects for bakery industry (cakes, biscuits, buns, bread etc.) are: ○ Generation of Food waste, non-edible by product & other refuse ○ Generation of air emission specially ppm during baking and heating operations ○ Generation of packaging waste ○ Wastewater generation from cleaning of equipment and facility
2	Key processes involved in preparation of snacks and savories are: ○ Generation of Food waste, non-edible by product & other refuse ○ Generation of used and contaminated oil by product ○ Generation of packaging waste ○ Wastewater generation from cleaning of equipment and facility

xxiii. Key requirements of FSSAI for Bakery industry

Table 52 – Key FSSAI requirements for the Bakery industry

• FSSAI has documented and released food industry guide to implement good manufacturing practices and good hygiene practices requirements for bakery and bakery products in October 2017, which is based on Part II &III of Schedule 4 of Food Safety & Standards (Licensing & Registration of Food Businesses) Regulation, 2011 • This guidance document is prepared with the intent to provide implementation guidance to food businesses (especially the small and medium businesses) involved in manufacturing, packing, storage and transportation of bakery products including Biscuits b) Bread c) Cakes & pies, to ensure that critical food safety related aspects are addressed throughout the supply chain • The major activities in the milling industry covered under this document comprise of the following: a) Receiving & storing of raw material; b) Manufacturing & packing of bakery products and c) Storage/Warehousing & Transportation of bakery products • This documents mainly covers the following aspects, amongst other areas:

Design of facilities and control of operations	Describes the requirements for location, surroundings, building design and layout, walls ceilings, floors, equipment and utilities. It also covers storage, processing, quality testing, transportation, distribution and recall
Maintenance and sanitation of unit	Describes the requirements for cleaning and sanitation program, animal and pest control, drainage and waste disposal
Personal hygiene and employee facilities	Covers personal cleanliness and behaviour, work wear, grooming and visitor control
Other Aspects	Other aspects include Sub-contracting of products, detailed stepwise recommendatory guidelines for implementation of Hazard Analysis and Critical Control Point (HACCP) system by FBOs, an inspection checklist for FBOs to audit their operations, mandatory and recommendatory formats

xxiv. Key environmental requirements for packaged food processing industry:

Table 53 – Key Environmental requirements of the Packaged food items industry in India

- In March 2016, MoEFCC has released 'Re-Categorisation of Industries based on their pollution load.
- As per the re-categorization:
- Bakery and confectionery units with production capacity > 1 TPD. (with ovens/furnaces) is classified as orange category whereas Bakery/ confectionery / sweets products (with production capacity < 1 tpd (with gas or electrical oven) is classified as green category on the basis of small quantities of waste water generated from washing activities
- For various other segments, the following standards are proposed

Consent to operate	It is obligatory for the industries to obtain consent to operate from respective State Pollution Control Board.			
Effluent Discharge Standards	Parameter	Effluent	Concentration not to exceed - mg/l except pH	Quantum gm/MT of product
	Continuous process (More than 20T/day)	pH	6.5 - 8.5	-
		BOD [3Days at 27°C]	200	25

Appendix A. - Appendices

A.1. Environmental Management Plan for Dairy processing industry

S No	Section	Requirements
1	Registration, licenses and permissions	*Consent to Operate/No Objection Certificate:* • Have you applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________ *FSSAI License/Registration:* • Have you applied for/obtained the FSSAI License/Registration? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________ *Shops & Establishment Certificate:* • Have you applied for/obtained Shops & Establishment Certificate? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________

2	Basic and environmental baseline information of the unit	Full name of the applicant: (Occupier of the unit) Designation:

A.1.1. Project baseline information/ screening checklist

The following checklist is to be used at the time of appraisal of projects for consideration under the IFPVAP scheme. These details are required to be entered by individual project proponents/ beneficiaries.

These details need to be reviewed by TSP on project basis, SPIU on half yearly basis and NPMU Environmental Safeguard specialist from an overall perspective. A copy of these requirements must be maintained at the project proponents/ beneficiaries level so that they can fulfil the requirements of the Environmental Management Framework.

		Full Name of the Unit: Factory address with Pin Code: Survey Number Village Taluk District Mobile Number: Email ID: Extent of land (in Hectares): (Owned/Leased) Total area: Build up area: Nature of work (Continuous/Seasonal): In case of seasonal work, please mention the months of operations: Production capacity (T/m or KL/m or Nos/m): Average water consumption (in KL/m): Average electricity consumption: Details of raw material used:

S No	Name of the raw material	Quantity	T/m or KL/m or Nos/m	Principal use

Details of fuel used:

S No	Type of fuel	Point of Use	Quantity in T/d or KL/d

		<table><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table> Details of products manufactured:

S No	Name of the product	Quantity	T/m or KL/m or Nos/m	End use
	Products			
	Byproducts			
	Intermediate products			

Manufacturing process with a list of equipment/machinery used:

Details of sewage/effluent generation and disposal:

Outlet No	Description of Outlet (Indicate sewage or trade effluent)	Maximum daily discharge in KLD	Mode of disposal
	Sewage		

	Trade effluent		

Details of Non-hazardous Solid Waste generated by the unit:

S No	Nature of Solid Waste	Quantity (T/month)	Mode of disposal

Details of Hazardous Wastes generated by the unit

S No	**Category No**	**Name of the waste**	**Quantity (T/A)**	**Mode of disposal**

Details of emission/noise sources:

S No	Source	Control Measures	Material of Construction	Stack details					Fan/blower/pump capacity
				Diameter in M	Height above GL in Metres	Exit gas velocity in m/s	Exit gas temp in oC	Maximum discharge in M3/hr	
1. Point sources of Emission									
	DG sets								
	Boiler								

3	Implementing EMP guidelines – dairy sector	***Design and Facilities:*** • The establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • There should not be any stagnant water surrounding the facility. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • The building of the establishment shall provide sufficient protection against the entry and harbourage of rodent, insects, animals etc. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • The establishment shall have signboards directing the employees to wash and sanitize hands before entering and after each absence. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • The premises shall be free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles. (Yes/No)

		If No, when do you plan to mitigate the same Please mention duration: ______________________________ • The door shall be easy to clean, shall be close-fitting and with suitable precautions to prevent entry of pests and in case it has gaps between the door and the floor, it should be closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry. Wooden doors are not recommended as it promotes mould growth, termites with ageing. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • External opening windows, roof vents or exhaust fan, where present, shall be adequately screened to avoid any external pest ingress. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ ***Control of Operation:*** • All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • All packaged raw materials shall be checked for 'expiry date'/'best before'/'use by date', packaging integrity and storage conditions. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • The incoming vehicles that bring the raw materials, shall be checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • Transportation time for raw milk to dairy plant/MCC/BMC should be within 4 hours of milking. Ingredients and products requiring refrigeration shall be transported and stored at 5°C or less but not frozen. Frozen ingredients and products shall be transported and stored at temperatures which do not permit thawing (for example, below zero degree Celsius). (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • Food handlers will be vaccinated against the enteric group of diseases as per recommended schedule of the vaccine and a records shall be maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________

		• Raw milk receiving section shall be sufficiently separated from processing area to prevent cross contamination. (Yes/No) If No, when do you plan to mitigate the same

		Please mention duration: ______________________________ • The refrigeration system shall be equipped with necessary temperature gauges, pressure gauges, strainers and filters to ensure smooth and efficient operations. The gauges and control devices shall be functions and calibrated periodically. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • In case, the equipment & utensils are also used for purpose other than preparation of milk and milk products, adequate control measures shall be implemented such as cleaning, sanitization etc. to ensure avoidance of cross-contamination. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • Where water filters are used, they shall be regularly monitored or effectively maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • Personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment room shall be available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • The Storage of raw materials, ingredients, work-in-progress and processed/packed food products shall be subject to FIFO (First in, First out), FEFO (First Expire, First out) stock rotation system as applicable. To meet this, adequate stock rotation systems should be in place. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ ***Waste Management and Disposal:*** • Dairy has two kinds of waste disposal i.e. solid waste and liquid effluent. There shall be a separate space in the premises for collection of waste material. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • In case the enterprise does not have an ETP for the treatment of waste water, the enterprise shall have the facility to store the wastewater which then will be disposed-off to an authorized disposal agency. Under no circumstance shall the unit dispose the waste water in the drain or soil. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • Containers for holding garbage shall be of adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect. It should be kept closed, preferably foot operated. (Yes/No)

		If No, when do you plan to mitigate the same Please mention duration: ______________________________

		• Waste shall be segregated into wet and dry garbage and shall be removed periodically. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Testing and Quality Assurance:*** • Potable water quality shall be as specified in the latest edition of BIS standard on drinking water (IS 10500). Potable water shall be analyzed at least semiannually to confirm that it meets the requirements of this standard. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Quality control programme shall be in place to include inspection and testing of incoming raw materials and finished products. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Packaging:*** • Printed packaging materials shall be stored in safe, separate and secured manner. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • All materials and product should be clearly marked with their relevant Identification/ Lot Number, if possible, barcoding system should be developed. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Traceability:*** • The enterprise shall maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • The enterprise shall maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

4	EMP guidelines for occupational Health & Safety	• The establishment shall have adequate lighting and ventilation and light fixtures shall be protected with proper covering. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • The establishment's floor shall be non-slippery, sloped appropriately, to allow adequate drainage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ The establishment's floor shall be maintained in good repair with no cracks and crevices. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Necessary industrial safety precautions shall be taken to avoid mishaps occurring due to fire/refrigerant gas leakage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Sufficient number and separate toilets/urinals for male and female should be provided. Industry best practice of 1:25 is followed for facility: employee ratio. Lavatories shall be separate from other areas and shall not be directly connected to the storage and manufacturing areas. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Wherever compressed air storage tanks are used they should be tested for pressure and structural integrity at periodic intervals. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Personal protective equipment for the workforce, where required, shall be used for worker's safety. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ A fire NOC shall be obtained. All the necessary firefighting equipment shall be installed and trainings will be imparted to the workforce. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

S No	Section	Requirement / guidelines

1	Quality inspection of incoming material	• All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities • An approved vendor should be evaluated as per the quality supplied and other relevant factors • All raw materials, ingredients and packing material and processing aids, wherever applicable, shall be inspected and sorted before processing. The manufacturer shall have procedures in place to confirm that the incoming materials meet the documented specifications through certificate of analysis, visual inspection, laboratory testing, review of label for allergens etc • Incoming vehicles should be checked for cleanliness and also for any source of possible contamination

A.1.2. Best practice guidelines to be circulated to the food industry owner:

The following are some of the best practice guidelines for enhancing the performance and competitiveness of the dairy processing enterprises under the IFPVAP scheme.

S No	Section	Requirement / guidelines
		Records of incoming raw materials should be maintained
2	Storage of raw material, interim product and final produce	• Raw materials, ingredients, packing material and finished goods shall be stored separately on pallets in clean, dry, well ventilated spaces protected from dust, condensation, fumes, odors or other sources of contamination • Periodic visual checks should be made of all pallets, racks and other storage infrastructure, w.r.t structural integrity and infestations Storage area temperatures shall be maintained and monitored regularly
3	Ongoing quality inspection	• Intermediate in-process samples to be tested for critical parameters and their test results shall be maintained • Process water, steam and drinking water should conform to potability standard (IS 10500) • Preventive maintenance of equipment and machinery shall be carried out regularly as per the instructions of the manufacturer
4	Waste management	• All milk and milk product waste and other waste materials shall be removed regularly from the places where milk and milk products are handled, or processed or packed. • Adequate drainage and waste disposal systems and facilities shall be designed and constructed so that the risk of contaminating milk/milk products or potable water supply is avoided • Drains shall be equipped with appropriate traps • Segregation of non-biodegradable waste like plastics /metals / glass materials, bags, containers should be done, before disposal Waste disposal shall be done in accordance with local rules and regulations in a hygienic manner
5	Pest control and infestation prevention	• Windows, doors and ventilation openings shall be designed to minimize pest entry • The pest control will be carried out with permissible chemical, physical or biological agents, within the appropriate limits. Records of pesticides/insecticides used shall be maintained to show the type, quantity and concentrations used; where, when and how applied, and the target pest

S No	Section	Requirement / guidelines
8	Monitoring and review	FBO shall also undertake a complete review of the systems including self- evaluation results, customer feedback, complaints, new technologies and regulatory updates at periodic intervals, but at least once in a year for continual improvement
9	Product traceability and recall	• Batch wise production and sale records needs to be maintained • Damaged/ returned goods should be placed in a designated area, labelled and physically segregated for appropriate disposal. • Records for such returned or recalled materials, with action taken, shall be properly maintained as per the FSSR recall regulation 2017
6	Employee health and hygiene	• Milk and milk product handlers of the manufacturing facility shall undergo a medical examination by a registered medical practitioner before joining for work and thereafter annually • Food handlers shall report the following conditions to the management for possible exclusion from Milk and milk product handling areas – jaundice, diarrhoea, vomiting, fever, sore throat with fever, visibly infected lesions, (boils, cuts or sores) and discharges from ear, eye or nose. Medical examination of a Milk and milk product handler shall be carried out apart from the periodic medical examination, if clinically or epidemiologically indicated • Food handlers must wear clean and washable or disposable overclothing (including headgear, nose mask, shoe cover and where appropriate, neckcovering and/or beard snood) • Personal effects such as jewelry, watches, pins, perfumes or other items should not be worn or brought into food handling areas if they pose a threat to the safety and suitability of food • Work wear shall provide adequate coverage to ensure that hair, perspiration, etc. cannot contaminate the product • Each new employee should receive training upon employment. This training should be repeated, modified or extended as required
7	Product labelling	• All packaged food products shall carry a label and requisite information as per provisions of Food Safety and Standards Act, 2006 • This should also include information that identifies food allergens in the product as ingredients

A.1.3. Auditor's checklist for monitoring and evaluation:

The following checklist is to be used at the time of monitoring of projects for inclusion under the IFPVAP scheme.
A copy of the checklist will be filled by the monitoring agency auditors and information received from the screening checklist will be verified.

S No	Section	Requirements
1	Registration, licenses and permissions	1. Has the enterprise applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) 2. Has the enterprise applied for/obtained the FSSAI License/Registration? (Yes/No) 3. Has the enterprise applied for/obtained the Shops & Establishment Certificate? (Yes/No)

2	Baseline Environmental data	Check the following documents for the baseline assessment: 1. Six monthly environmental testing reports submitted to the State Pollution Control Board 2. Environmental Statement (Form-5) submitted to the State Pollution Control Board 3. Electricity bill for the last 3 months 4. Water bill for the last 3 months 5. Contract for the authorized waste disposal contractor with the related waste disposal paperwork
3	Implementing EMP guidelines – dairy sector	***Design and Facilities:*** • Does the establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises? (Yes/No) • Is there any stagnant water surrounding the facility? (Yes/No) • Does the building of the establishment provide sufficient protection against the entry and harbourage of rodent, insects, animals etc? (Yes/No) • Does the establishment have signboards directing the employees to wash and sanitize hands before entering and after each absence? (Yes/No) • Is the premises free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles? (Yes/No) • Is the door easy to clean, close-fitting and with suitable precautions to prevent entry of pests? (Yes/No)

- In case the door has gaps between the door and the floor, is it closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry? (Yes/No)
- Are wooden doors being used at the enterprise? (Yes/No)
- Are the external opening windows, roof vents or exhaust fan, where present, adequately screened to avoid any external pest ingress? (Yes/No)

Control of Operation:

- Is all the raw material, processing aids, ingredients consignments procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities? (Yes/No)
- Does all packaged raw materials checked for 'expiry date'/'best before'/'use by date', packaging integrity and storage conditions? (Yes/No)
- Are the incoming vehicles that bring the raw materials, checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material? (Yes/No)
- Is the transportation time for raw milk to dairy plant/MCC/BMC within 4 hours of milking? (Yes/No)
- Does the ingredients and products requiring refrigeration transported and stored at 5°C or less but not frozen? (Yes/No)
- Does the frozen ingredients and products transported and stored at temperatures which do not permit thawing (for example, below zero degree Celsius)? (Yes/No)
- Are the food handlers vaccinated against the enteric group of diseases as per recommended schedule of the vaccine? Are the records maintained? (Yes/No)
- Is the raw milk receiving section sufficiently separated from processing area to prevent cross contamination? (Yes/No)
- Is the refrigeration system equipped with necessary temperature gauges, pressure gauges, strainers and filters to ensure smooth and efficient operations? (Yes/No)
- Are the gauges and control devices functions and calibrated periodically? (Yes/No)
- In case, the equipment & utensils are also used for purpose other than preparation of milk and milk products, are there adequate control measures implemented such as cleaning, sanitization etc. to ensure avoidance of cross-contamination? (Yes/No)
- Where water filters are used, are they regularly monitored or effectively maintained? (Yes/No)

		• Are personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination? (Yes/No)

		• Is the Storage of raw materials, ingredients, work-in-progress and processed/packed food products subject to FIFO (First in, First out), FEFO (First Expire, First out) stock rotation system as applicable? To meet this, adequate stock rotation systems are in place? (Yes/No) ***Waste Management and Disposal:*** • Dairy has two kinds of waste disposal i.e. solid waste and liquid effluent. Is there a separate space in the premises for collection of waste material? (Yes/No) • In case the enterprise does not have an ETP for the treatment of waste water, does the enterprise have the facility to store the wastewater which then is being disposed-off to an authorized disposal agency? (Yes/No) • Does the unit dispose the untreated waste water in the drain or soil? (Yes/No) • Does the containers for holding garbage adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect? • Is it kept closed, preferably foot operated? (Yes/No) • Is the waste segregated into wet and dry garbage and removed periodically? (Yes/No) ***Testing and Quality Assurance:*** • Is the potable water tested for BIS standard for IS 10500? (Yes/No) • Is the potable water analyzed at least semi-annually to confirm that it meets the requirements of this standard? (Yes/No) • Is there a quality control programme in place to include inspection and testing of incoming raw materials and finished products? (Yes/No) ***Packaging:*** • Is the printed packaging materials stored in safe, separate and secured manner? (Yes/No) • Does all the materials and product clearly marked with their relevant Identification/ Lot Number? Does the unit have barcoding? (Yes/No) ***Traceability:***

		• Does the enterprise maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability? (Yes/No) • Does the enterprise maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability? (Yes/No)
4	EMP guidelines for occupational Health & Safety	• Did the establishment have adequate lighting and ventilation? (Yes/No) • Were the light fixtures protected with proper covering? (Yes/No)

		Are the establishment's floor non-slippery, sloped appropriately, to allow adequate drainage? (Yes/No) Are the establishment's floor maintained in good repair with no cracks and crevices? (Yes/No) Does necessary industrial safety precautions taken to avoid mishaps occurring due to fire/refrigerant gas leakage? (Yes/No) Were there sufficient number and separate toilets/urinals for male and female provided? Industry best practice of 1:25 is followed for facility: employee ratio. Was the lavatories separate from other areas and not directly connected to the storage and manufacturing areas? (Yes/No) Wherever compressed air storage tanks are used, were they tested for pressure and structural integrity at periodic intervals? (Yes/No) Were the workers provided with Personal protective equipment? (Yes/No) Has the enterprise obtained a fire NOC? (Yes/No) Does the enterprise have all the necessary firefighting equipment installed and trainings imparted to the workforce? (Yes/No)

Please note that this is an indicative list. FSSAI's FSMS guidance document covers all the regulatory as well as the suggested best practices for this food processing category. The document is available at https://archive.fssai.gov.in/home/safe-food-practices/FSMS-GUIDANCE-DOCUMENTS-FOR-THE-FOOD-BUSINESSES.html

A.2. Environmental Management Plan for Fruits & vegetable processing industry

A.2.1. Project baseline information/ screening checklist

S No	Section	Requirements
1	Registration, licenses and permissions	*Consent to Operate/No Objection Certificate:* • Have you applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ___________________________________ *FSSAI License/Registration:* • Have you applied for/obtained the FSSAI License/Registration? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ___________________________________ *Shops & Establishment Certificate:* • Have you applied for/obtained Shops & Establishment Certificate? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ___________________________________

2	Basic and environmental baseline information of the unit	Full name of the applicant: (Occupier of the unit) Designation: Full Name of the Unit: Factory address with Pin Code: Survey Number Village Taluk District Mobile Number: Email ID: Extent of land (in Hectares): (Owned/Leased)

Total area:
Build up area:

Nature of work (Continuous/Seasonal):

In case of seasonal work, please mention the months of operations:

Production capacity (T/m or KL/m or Nos/m):

Average water consumption (in KL/m):

Average electricity consumption:

Details of raw material used:

S No	Name of the raw material	Quantity	T/m or KL/m or Nos/m	Principal use

Details of fuel used:

S No	Type of fuel	Point of Use	Quantity in T/d or KL/d

Details of products manufactured:

S No	Name of the product	Quantity	T/m or KL/m or Nos/m	End use
	Products			
	Byproducts			

		<table><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>**Intermediate products**</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table> Manufacturing process with a list of equipment/machinery used:

Details of sewage/effluent generation and disposal:

Outlet No	Description of Outlet (Indicate sewage or trade effluent)	Maximum daily discharge in KLD	Mode of disposal
	Sewage		
	Trade effluent		

Details of Non-hazardous Solid Waste generated by the unit:

S No	Nature of Solid Waste	Quantity (T/month)	Mode of disposal

Details of Hazardous Wastes generated by the unit

S No	Category No	Name of the waste	Quantity (T/A)	Mode of disposal

Details of emission/noise sources:

	Source		Material of	Stack details	

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<tr><td>S No</td><td></td><td>Control Measures</td><td>Construction</td><td>Diameter in M</td><td>Height above GL in Metres</td><td>Exit gas velocity in m/s</td><td>Exit gas temp in oC</td><td>Maximum discharge in M3/hr</td><td>Fan/blower/pump capacity</td></tr>
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<tr>
<td>3</td>
<td>Implementing EMP guidelines – fruits & vegetable sector</td>
<td>
Design and Facilities:

The establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
There should not be any stagnant water surrounding the facility. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The building of the establishment shall provide sufficient protection against the entry and harbourage of rodent, insects, animals etc. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The establishment shall have signboards directing the employees to wash and sanitize hands before entering and after each absence. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The premises shall be free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The door shall be easy to clean, shall be close-fitting and with suitable precautions to prevent entry of pests and in case it has gaps between the door and the floor, it should be closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry. Wooden doors are not recommended as it promotes mould growth, termites with ageing. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
External opening windows, roof vents or exhaust fan, where present, shall be adequately screened to avoid any external pest ingress. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________

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		Control of Operation:

			All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ Raw materials should be purchased in quantities that correspond to storage/ preservation capacity. Receiving temperature of potentially high risk food should be at or below 50C or below; or 600C or above. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ Receiving temperature of frozen food should be -180C or below. Records of the receiving temperatures of potentially hazardous and frozen foods must be maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ The Storage of raw materials, ingredients, work-in-progress and processed/packed food products shall be subject to FIFO (First in, First out), FEFO (First Expire, First out) stock rotation system as applicable. To meet this, adequate stock rotation systems should be in place. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ All packaged raw materials shall be checked for ‘expiry date’/’best before’/’use by date’, packaging integrity and storage conditions. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ The incoming vehicles that bring the raw materials, shall be checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ Food handlers will be vaccinated against the enteric group of diseases as per recommended schedule of the vaccine and a records shall be maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

		- Where water filters are used, they shall be regularly monitored or effectively maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: _______________________________ - Personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment room shall be available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: _______________________________

- Fruits & vegetables should be washed as needed to remove soil or other contamination. Water used for washing, rinsing, or conveying final food products should be of potable quality. Fruits and vegetables that are already cleaned & sanitized for microbial reduction should be stored separately from untreated fruits and vegetables. (Yes/No)
  If No, when do you plan to mitigate the same
  Please mention duration: _______________________________

Waste Management and Disposal:

- In case the enterprise does not have an ETP for the treatment of waste water, the enterprise shall have the facility to store the wastewater which then will be disposed-off to an authorized disposal agency. Under no circumstance shall the unit dispose the waste water in the drain or soil. (Yes/No)
  If No, when do you plan to mitigate the same
  Please mention duration: _______________________________

- Containers for holding garbage shall be of adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect. It should be kept closed, preferably foot operated. (Yes/No)
  If No, when do you plan to mitigate the same
  Please mention duration: _______________________________

- Waste shall be segregated into wet and dry garbage and shall be removed periodically. (Yes/No) If No, when do you plan to mitigate the same
  Please mention duration: _______________________________

Testing and Quality Assurance:

- Potable water quality shall be as specified in the latest edition of BIS standard on drinking water (IS 10500). Potable water shall be analyzed at least semiannually to confirm that it meets the requirements of this standard. (Yes/No)
  If No, when do you plan to mitigate the same
  Please mention duration: _______________________________

- Quality control programme shall be in place to include inspection and testing of incoming raw materials and finished products. (Yes/No)
  If No, when do you plan to mitigate the same
  Please mention duration: _______________________________

Packaging:

- Printed packaging materials shall be stored in safe, separate and secured manner. (Yes/No)
  If No, when do you plan to mitigate the same
  Please mention duration: _______________________________

		• All materials and product should be clearly marked with their relevant Identification/ Lot Number, if possible, barcoding system should be developed. (Yes/No)

		If No, when do you plan to mitigate the same Please mention duration: ______________________________ • Only Food grade packaging materials shall be used. Packaging materials like aluminium, tin and plastic shall conform to the Indian standards as mentioned under the FSS Regulations. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ ***Traceability:*** • The enterprise shall maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ • The enterprise shall maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________

		Personal protective equipment for the workforce, where required, shall be used for worker's safety. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________ A fire NOC shall be obtained. All the necessary firefighting equipment shall be installed and trainings will be imparted to the workforce. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________
4	EMP guidelines for occupational Health & Safety	• The establishment shall have adequate lighting and ventilation and light fixtures shall be protected with proper covering. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________ • The establishment's floor shall be non-slippery, sloped appropriately, to allow adequate drainage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________ • The establishment's floor shall be maintained in good repair with no cracks and crevices. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________ • Necessary industrial safety precautions shall be taken to avoid mishaps occurring due to fire/refrigerant gas leakage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________ • Sufficient number and separate toilets/urinals for male and female should be provided. Industry best practice of 1:25 is followed for facility: employee ratio. Lavatories shall be separate from other areas and shall not be directly connected to the storage and manufacturing areas. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________ • Wherever compressed air storage tanks are used they should be tested for pressure and structural integrity at periodic intervals. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ___________________________

A.2.2. Best practice guidelines to be circulated to the food industry owner:

S No	Section	Requirement / guidelines
1	Quality inspection of incoming material	• All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities. • An approved vendor should be evaluated as per the quality supplied and other relevant factors • All raw materials, ingredients and packing material and processing aids, wherever applicable, shall be inspected and sorted before processing. The manufacturer shall have procedures in place to confirm that the incoming materials meet the documented specifications through certificate of analysis, visual inspection, laboratory testing, review of label for allergens etc. • Incoming vehicles should be checked for cleanliness and also for any source of possible contamination Records of incoming raw materials should be maintained
2	Storage of raw material, interim product and final produce	• Raw materials, ingredients, packing material and finished goods shall be stored separately on pallets in clean, dry, well ventilated spaces protected from dust, condensation, fumes, odors or other sources of contamination • Periodic visual checks should be made of all pallets, racks and other storage infrastructure, w.r.t structural integrity and infestations Storage area temperatures shall be maintained and monitored regularly
3	Ongoing quality inspection	• Intermediate in-process samples to be tested for critical parameters and their test results shall be maintained • Process water, steam and drinking water should conform to potability standard (IS 10500) • Preventive maintenance of equipment and machinery shall be carried out regularly as per the instructions of the manufacturer
4	Waste management	• All product waste and other waste materials shall be removed regularly from the places where the products are handled, or processed or packed. • Adequate drainage and waste disposal systems and facilities shall be designed and constructed so that the risk of contaminating fruits & vegetable products or potable water supply is avoided • Drains shall be equipped with appropriate traps • Segregation of non-biodegradable waste like plastics /metals / glass materials, bags, containers should be done, before disposal Waste disposal shall be done in accordance with local rules and regulations in a hygienic manner

S No	Section	Requirement / guidelines
5	Pest control and infestation prevention	• Windows, doors and ventilation openings shall be designed to minimize pest entry • The pest control will be carried out with permissible chemical, physical or biological agents, within the appropriate limits. Records of pesticides/insecticides used shall be maintained to show the type, quantity and concentrations used; where, when and how applied, and the target pest

6	Employee health and hygiene	• Fruits & vegetable product handlers of the manufacturing facility shall undergo a medical examination by a registered medical practitioner before joining for work and thereafter annually • Food handlers must wear clean and washable or disposable overclothing (including headgear, nose mask, shoe cover and where appropriate, neckcovering and/or beard snood) • Personal effects such as jewelry, watches, pins, perfumes or other items should not be worn or brought into food handling areas if they pose a threat to the safety and suitability of food • Work wear shall provide adequate coverage to ensure that hair, perspiration, etc. cannot contaminate the product • Each new employee should receive training upon employment. This training should be repeated, modified or extended as required
7	Product labelling	• All packaged food products shall carry a label and requisite information as per provisions of Food Safety and Standards Act, 2006 • This should also include information that identifies food allergens in the product as ingredients
8	Monitoring and review	• FBO shall also undertake a complete review of the systems including self- evaluation results, customer feedback, complaints, new technologies and regulatory updates at periodic intervals, but at least once in a year for continual improvement
9	Product traceability and recall	• Batch wise production and sale records needs to be maintained • Damaged/ returned goods should be placed in a designated area, labelled and physically segregated for appropriate disposal. • Records for such returned or recalled materials, with action taken, shall be properly maintained as per the FSSR recall regulation 2017

S No	Section	Requirements
1	Registration, licenses and permissions	1. Has the enterprise applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) 2. Has the enterprise *a*pplied for/obtained the FSSAI License/Registration? (Yes/No) 3. Has the enterprise applied for/obtained the Shops & Establishment Certificate? (Yes/No)

2	Baseline Environmental data	Check the following documents for the baseline assessment: 6. Six monthly environmental testing reports submitted to the State Pollution Control Board 7. Environmental Statement (Form-5) submitted to the State Pollution Control Board 8. Electricity bill for the last 3 months 9. Water bill for the last 3 months

A.2.3. *Auditor's checklist for monitoring and evaluation:*

The following checklist is to be used at the time of monitoring of projects for inclusion under the IFPVAP scheme.
A copy of the checklist will be filled by the monitoring agency auditors and information received from the screening checklist will be verified.

		10. Contract for the authorized waste disposal contractor with the related waste disposal paperwork

3	Implementing EMP guidelines – Fruits & vegetable sector	***Design and Facilities:*** • Does the establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises? (Yes/No) • Is there any stagnant water surrounding the facility? (Yes/No) • Does the building of the establishment provide sufficient protection against the entry and harbourage of rodent, insects, animals etc? (Yes/No) • Does the establishment have signboards directing the employees to wash and sanitize hands before entering and after each absence? (Yes/No) • Is the premises free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles? (Yes/No) • Is the door easy to clean, close-fitting and with suitable precautions to prevent entry of pests? (Yes/No) • In case the door has gaps between the door and the floor, is it closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry? (Yes/No) • Are wooden doors being used at the enterprise? (Yes/No) • Are the external opening windows, roof vents or exhaust fan, where present, adequately screened to avoid any external pest ingress? (Yes/No) ***Control of Operation:*** • Is all the raw material, processing aids, ingredients consignments procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities? (Yes/No) • Is the raw materials purchased in quantities that correspond to storage/ preservation capacity? Is the receiving temperature of potentially high risk food at or below 50C or below; or 600C or above? (Yes/No) • Is the receiving temperature of frozen food -180C or below? Are the records of the receiving temperatures of potentially hazardous and frozen foods maintained? (Yes/No) • Is the storage of raw materials, ingredients, work-in-progress and processed/packed food products subject to FIFO (First in, First out), FEFO (First Expire, First out) stock rotation system as applicable? To meet this, does the adequate stock rotation systems is in place? (Yes/No) • Does all packaged raw materials checked for 'expiry date'/'best before'/'use by date', packaging integrity and storage conditions? (Yes/No)

		• Are the incoming vehicles that bring the raw materials, checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material? (Yes/No) • Is the incoming vehicles that bring the raw materials, checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material? (Yes/No) • Are the food handlers vaccinated against the enteric group of diseases as per recommended schedule of the vaccine? Are the records maintained? (Yes/No) • Is the raw milk receiving section sufficiently separated from processing area to prevent cross contamination? (Yes/No) • Is the refrigeration system equipped with necessary temperature gauges, pressure gauges, strainers and filters to ensure smooth and efficient operations? (Yes/No) • Are the gauges and control devices functions and calibrated periodically? (Yes/No) • In case, the equipment & utensils are also used for purpose other than preparation of milk and milk products, are there adequate control measures implemented such as cleaning, sanitization etc. to ensure avoidance of cross-contamination? (Yes/No) • Where water filters are used, are they regularly monitored or effectively maintained? (Yes/No) • Are personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination? (Yes/No) • Fruits & vegetables should be washed as needed to remove soil or other contamination. Is the water used for washing, rinsing, or conveying final food products of potable quality? Does the fruits and vegetables that are already cleaned & sanitized for microbial reduction should be stored separately from untreated fruits and vegetables? (Yes/No) ***Waste Management and Disposal:*** • In case the enterprise does not have an ETP for the treatment of waste water, does the enterprise have the facility to store the wastewater which then is being disposed-off to an authorized disposal agency? (Yes/No) • Does the unit dispose the untreated waste water in the drain or soil? (Yes/No) • Does the containers for holding garbage adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect?

		• Is it kept closed, preferably foot operated? (Yes/No) • Is the waste segregated into wet and dry garbage and removed periodically? (Yes/No)

		Testing and Quality Assurance: • Is the potable water tested for BIS standard for IS 10500? (Yes/No) • Is the potable water analyzed at least semi-annually to confirm that it meets the requirements of this standard? (Yes/No) • Is there a quality control programme in place to include inspection and testing of incoming raw materials and finished products? (Yes/No) ***Packaging:*** • Is the printed packaging materials stored in safe, separate and secured manner? (Yes/No) • Does all the materials and product clearly marked with their relevant Identification/ Lot Number? Does the unit have barcoding? (Yes/No) • Are only Food grade packaging materials used? Packaging materials like aluminium, tin and plastic conform to the Indian standards as mentioned under the FSS Regulations? (Yes/No) ***Traceability:*** • Does the enterprise maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability? (Yes/No) • Does the enterprise maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability? (Yes/No)

4	EMP guidelines for occupational Health & Safety	Did the establishment have adequate lighting and ventilation? (Yes/No) Were the light fixtures protected with proper covering? (Yes/No) Are the establishment's floor non-slippery, sloped appropriately, to allow adequate drainage? (Yes/No) Are the establishment's floor maintained in good repair with no cracks and crevices? (Yes/No) Does necessary industrial safety precautions taken to avoid mishaps occurring due to fire/refrigerant gas leakage? (Yes/No) Were there sufficient number and separate toilets/urinals for male and female provided? Industry best practice of 1:25 is followed for facility: employee ratio. Was the lavatories separate from other areas and not directly connected to the storage and manufacturing areas? (Yes/No) Wherever compressed air storage tanks are used, were they tested for pressure and structural integrity at periodic intervals? (Yes/No) Were the workers provided with Personal protective equipment? (Yes/No) Has the enterprise obtained a fire NOC? (Yes/No) Does the enterprise have all the necessary firefighting equipment installed and trainings imparted to the workforce? (Yes/No)

Please note that this is an indicative list. FSSAI's FSMS guidance document covers all the regulatory as well as the suggested best practices for this food processing category. The document is available at https://archive.fssai.gov.in/home/safe-food-practices/FSMS-GUIDANCE-DOCUMENTS-FOR-THE-FOOD-BUSINESSES.html

A.3. Environmental Management Plan for Grains & Oilseed processing industry

A.3.1. Project baseline information/ screening checklist

S No	Section	Requirements
1	Registration, licenses and permissions	*Consent to Operate/No Objection Certificate:* • Have you applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________ *FSSAI License/Registration:* • Have you applied for/obtained the FSSAI License/Registration? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________ *Shops & Establishment Certificate:* • Have you applied for/obtained Shops & Establishment Certificate? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________

2	Basic and environmental baseline information of the unit	Full name of the applicant: (Occupier of the unit) Designation: Full Name of the Unit: Factory address with Pin Code: Survey Number Village Taluk District Mobile Number: Email ID:

Extent of land (in Hectares): (Owned/Leased) Total
area:
Build up area:

Nature of work (Continuous/Seasonal):

In case of seasonal work, please mention the months of operations:

Production capacity (T/m or KL/m or Nos/m):

Average water consumption (in KL/m):

Average electricity consumption:

Details of raw material used:

S No	**Name of the raw material**	**Quantity**	**T/m or KL/m or Nos/m**	**Principal use**

Details of fuel used:

S No	**Type of fuel**	**Point of Use**	**Quantity in T/d or KL/d**

Details of products manufactured:

S No	**Name of the product**	**Quantity**	**T/m or KL/m or Nos/m**	**End use**
	Products			

				Byproducts				
				Intermediate products				

Manufacturing process with a list of equipment/machinery used:

Details of sewage/effluent generation and disposal:

Outlet No	Description of Outlet (Indicate sewage or trade effluent)	Maximum daily discharge in KLD	Mode of disposal
	Sewage		
	Trade effluent		

Details of Non-hazardous Solid Waste generated by the unit:

S No	Nature of Solid Waste	Quantity (T/month)	Mode of disposal

Details of Hazardous Wastes generated by the unit

S No	Category No	Name of the waste	Quantity (T/A)	Mode of disposal

Details of emission/noise sources:

	Source		Material of	Stack details	

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<td>Implementing EMP guidelines – grains & oilseed sector</td>
<td>
Design and Facilities:

The establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
There should not be any stagnant water surrounding the facility. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The building of the establishment shall provide sufficient protection against the entry and harbourage of rodent, insects, animals etc. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The establishment shall have signboards directing the employees to wash and sanitize hands before entering and after each absence. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The premises shall be free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The door shall be easy to clean, shall be close-fitting and with suitable precautions to prevent entry of pests and in case it has gaps between the door and the floor, it should be closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry. Wooden doors are not recommended as it promotes mould growth, termites with ageing. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
External opening windows, roof vents or exhaust fan, where present, shall be adequately screened to avoid any external pest ingress. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________

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		Control of Operation:

			- All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ - The Storage of raw materials, ingredients, work-in-progress and processed/packed food products shall be subject to FIFO (First in, First out), FEFO (First Expire, First out) stock rotation system as applicable. To meet this, adequate stock rotation systems should be in place. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ - Equipment such as sieves, carter disks, treur cylinders, de stoners, separators, combinators, scourers, magnets and metal detectors should be used to control foreign body contamination by cleaning the incoming wheat as well as to protect the final product. Equipment such as sifters, purifiers, roller stands etc. should be designed in such a manner as to allow both inspection and cleaning simultaneously. Equipment such as a flashlight, equipment opening tools, spatula, sample containers, sieves, pans etc. should be available for inspection. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ - The incoming vehicles that bring the raw materials, shall be checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ - Food handlers will be vaccinated against the enteric group of diseases as per recommended schedule of the vaccine and a records shall be maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ - Where water filters are used, they shall be regularly monitored or effectively maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ - Personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment room shall be available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

		- Mills should also have a good dust collecting and discharge system. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: _______________________________ - Spices are susceptible to mould contamination and/or growth if storage conditions are not appropriate. Spices should be stored in an environment with humidity that does not result in product moisture that can support the growth of moulds. Storage areas shall be dry and well ventilated. (Yes/No)

		If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Waste Management and Disposal:*** • Containers for holding garbage shall be of adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect. It should be kept closed, preferably foot operated. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Waste shall be segregated into wet and dry garbage and shall be removed periodically. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Testing and Quality Assurance:*** • Potable water quality shall be as specified in the latest edition of BIS standard on drinking water (IS 10500). Potable water shall be analyzed at least semiannually to confirm that it meets the requirements of this standard. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Quality control programme shall be in place to include inspection and testing of incoming raw materials and finished products. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Packaging:*** • All materials and product should be clearly marked with their relevant Identification/ Lot Number, if possible, barcoding system should be developed. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Only Food grade packaging materials shall be used. Packaging materials like aluminium, tin and plastic shall conform to the Indian standards as mentioned under the FSS Regulations. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Traceability:***

		• The enterprise shall maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability. (Yes/No) If No, when do you plan to mitigate the same

		Please mention duration: ________________________________ □ The enterprise shall maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________
4	EMP guidelines for occupational Health & Safety	□ The establishment shall have adequate lighting and ventilation and light fixtures shall be protected with proper covering. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ □ The establishment's floor shall be non-slippery, sloped appropriately, to allow adequate drainage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ □ The establishment's floor shall be maintained in good repair with no cracks and crevices. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ □ Necessary industrial safety precautions shall be taken to avoid mishaps occurring due to fire/refrigerant gas leakage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ □ Sufficient number and separate toilets/urinals for male and female should be provided. Industry best practice of 1:25 is followed for facility: employee ratio. Lavatories shall be separate from other areas and shall not be directly connected to the storage and manufacturing areas. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ □ Personal protective equipment for the workforce, where required, shall be used for worker's safety. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ □ A fire NOC shall be obtained. All the necessary firefighting equipment shall be installed and trainings will be imparted to the workforce. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ □ Machine guards for the moving parts of the machinery shall be installed. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

A.3.2. Best practice guidelines to be circulated to the food industry owner:

The following are some of the best practice guidelines for enhancing the performance and competitiveness of the Grain & oilseed processing enterprises under the IFPVAP scheme.

S No	Section	Requirement / guidelines
1	Quality inspection of incoming material	• All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities. • An approved vendor should be evaluated as per the quality supplied and other relevant factors • All raw materials, ingredients and packing material and processing aids, wherever applicable, shall be inspected and sorted before processing. The manufacturer shall have procedures in place to confirm that the incoming materials meet the documented specifications through certificate of analysis, visual inspection, laboratory testing, review of label for allergens etc. • Incoming vehicles should be checked for cleanliness and also for any source of possible contamination Records of incoming raw materials should be maintained
2	Storage of raw material, interim product and final produce	• Raw materials, ingredients, packing material and finished goods shall be stored separately on pallets in clean, dry, well ventilated spaces protected from dust, condensation, fumes, odors or other sources of contamination • Periodic visual checks should be made of all pallets, racks and other storage infrastructure, w.r.t structural integrity and infestations Storage area temperatures shall be maintained and monitored regularly
3	Ongoing quality inspection	• Intermediate in-process samples to be tested for critical parameters and their test results shall be maintained • Process water, steam and drinking water should conform to potability standard (IS 10500) • Preventive maintenance of equipment and machinery shall be carried out regularly as per the instructions of the manufacturer
4	Waste management	• All product waste and other waste materials shall be removed regularly from the places where the products are handled, or processed or packed. • Adequate drainage and waste disposal systems and facilities shall be designed and constructed so that the risk of contaminating fruits & vegetable products or potable water supply is avoided • Drains shall be equipped with appropriate traps • Segregation of non-biodegradable waste like plastics /metals / glass materials, bags, containers should be done, before disposal Waste disposal shall be done in accordance with local rules and regulations in a hygienic manner
5	Pest control and infestation prevention	• Windows, doors and ventilation openings shall be designed to minimize pest entry • The pest control will be carried out with permissible chemical, physical or biological agents, within the appropriate limits. Records of pesticides/insecticides used shall be maintained to show the type, quantity and concentrations used; where, when and how applied, and the target pest

S No	Section	Requirement / guidelines
7	Product labelling	• All packaged food products shall carry a label and requisite information as per provisions of Food Safety and Standards Act, 2006 • This should also include information that identifies food allergens in the product as ingredients
8	Monitoring and review	FBO shall also undertake a complete review of the systems including self- evaluation results, customer feedback, complaints, new technologies and regulatory updates at periodic intervals, but at least once in a year for continual improvement
9	Product traceability and recall	• Batch wise production and sale records needs to be maintained • Damaged/ returned goods should be placed in a designated area, labelled and physically segregated for appropriate disposal. • Records for such returned or recalled materials, with action taken, shall be properly maintained as per the FSSR recall regulation 2017
6	Employee health and hygiene	• Grains & oilseed product handlers of the manufacturing facility shall undergo a medical examination by a registered medical practitioner before joining for work and thereafter annually • Food handlers must wear clean and washable or disposable overclothing (including headgear, nose mask, shoe cover and where appropriate, neckcovering and/or beard snood) • Personal effects such as jewelry, watches, pins, perfumes or other items should not be worn or brought into food handling areas if they pose a threat to the safety and suitability of food • Work wear shall provide adequate coverage to ensure that hair, perspiration, etc. cannot contaminate the product • Each new employee should receive training upon employment. This training should be repeated, modified or extended as required

A.3.3. Auditor's checklist for monitoring and evaluation:

The following checklist is to be used at the time of monitoring of projects for inclusion under the IFPVAP scheme.
A copy of the checklist will be filled by the monitoring agency auditors and information received from the screening checklist will be verified.

S No	Section	Requirements
1	Registration, licenses and permissions	1. Has the enterprise applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) 2. Has the enterprise applied for/obtained the FSSAI License/Registration? (Yes/No) 3. Has the enterprise applied for/obtained the Shops & Establishment Certificate? (Yes/No)
2	Baseline Environmental data	Check the following documents for the baseline assessment: 4. Six monthly environmental testing reports submitted to the State Pollution Control Board 5. Environmental Statement (Form-5) submitted to the State Pollution Control Board 6. Electricity bill for the last 3 months 7. Water bill for the last 3 months

		8. Contract for the authorized waste disposal contractor with the related waste disposal paperwork
3	Implementing EMP guidelines – grains & oilseed sector	***Design and Facilities:*** • Does the establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises? (Yes/No) • Is there any stagnant water surrounding the facility? (Yes/No) • Does the building of the establishment provide sufficient protection against the entry and harbourage of rodent, insects, animals etc? (Yes/No) • Does the establishment have signboards directing the employees to wash and sanitize hands before entering and after each absence? (Yes/No) • Is the premises free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles? (Yes/No)

		• Is the door easy to clean, close-fitting and with suitable precautions to prevent entry of pests? (Yes/No) • In case the door has gaps between the door and the floor, is it closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry? (Yes/No) • Are wooden doors being used at the enterprise? (Yes/No) • Are the external opening windows, roof vents or exhaust fan, where present, adequately screened to avoid any external pest ingress? (Yes/No) ***Control of Operation:*** • Is all the raw material, processing aids, ingredients consignments procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities? (Yes/No) • Is the storage of raw materials, ingredients, work-in-progress and processed/packed food products subject to FIFO (First in, First out), FEFO (First Expire, First out) stock rotation system as applicable? To meet this, does the adequate stock rotation systems is in place? (Yes/No) • Does equipment such as sieves, carter disks, treur cylinders, de stoners, separators, combinators, scourers, magnets and metal detectors used to control foreign body contamination by cleaning the incoming wheat as well as to protect the final product? (Yes/No) • Is the equipment such as sifters, purifiers, roller stands etc. designed in such a manner as to allow both inspection and cleaning simultaneously? (Yes/No) • Are the equipment such as a flashlight, equipment opening tools, spatula, sample containers, sieves, pans etc. available for inspection. (Yes/No) • Does all packaged raw materials checked for 'expiry date'/'best before'/'use by date', packaging integrity and storage conditions? (Yes/No) • Are the incoming vehicles that bring the raw materials, checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material? (Yes/No) • Is the incoming vehicles that bring the raw materials, checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material? (Yes/No) • Are the food handlers vaccinated against the enteric group of diseases as per recommended schedule of the vaccine? Are the records maintained? (Yes/No) • Where water filters are used, are they regularly monitored or effectively maintained? (Yes/No)

		• Are personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination? (Yes/No)

		• Do the mills have a good dust collecting and discharge system? (Yes/No) • Are spices storage areas dry and well ventilated? (Yes/No) ***Waste Management and Disposal:*** • Does the containers for holding garbage adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect? • Is it kept closed, preferably foot operated? (Yes/No) • Is the waste segregated into wet and dry garbage and removed periodically? (Yes/No) ***Testing and Quality Assurance:*** • Is the potable water tested for BIS standard for IS 10500? (Yes/No) • Is the potable water analyzed at least semi-annually to confirm that it meets the requirements of this standard? (Yes/No) • Is there a quality control programme in place to include inspection and testing of incoming raw materials and finished products? (Yes/No) ***Packaging:*** • Does all the materials and product clearly marked with their relevant Identification/ Lot Number? Does the unit have barcoding? (Yes/No) • Are only Food grade packaging materials used? Packaging materials like aluminium, tin and plastic conform to the Indian standards as mentioned under the FSS Regulations? (Yes/No) ***Traceability:*** • Does the enterprise maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability? (Yes/No) • Does the enterprise maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability? (Yes/No)

4	EMP guidelines for occupational Health & Safety	• Did the establishment have adequate lighting and ventilation? (Yes/No) • Were the light fixtures protected with proper covering? (Yes/No) • Are the establishment's floor non-slippery, sloped appropriately, to allow adequate drainage? (Yes/No) • Are the establishment's floor maintained in good repair with no cracks and crevices? (Yes/No)
		• Does necessary industrial safety precautions taken to avoid mishaps occurring due to fire/refrigerant gas leakage? (Yes/No) • Were there sufficient number and separate toilets/urinals for male and female provided? Industry best practice of 1:25 is followed for facility: employee ratio. Was the lavatories separate from other areas and not directly connected to the storage and manufacturing areas? (Yes/No) • Wherever compressed air storage tanks are used, were they tested for pressure and structural integrity at periodic intervals? (Yes/No) • Were the workers provided with Personal protective equipment? (Yes/No) • Has the enterprise obtained a fire NOC? (Yes/No) • Does the enterprise have all the necessary firefighting equipment installed and trainings imparted to the workforce? (Yes/No) • Have machine guards for the moving parts of the machinery been installed? (Yes/No)

Please note that this is an indicative list. FSSAI's FSMS guidance document covers all the regulatory as well as the suggested best practices for this food processing category. The document is available at https://archive.fssai.gov.in/home/safe-food-practices/FSMS-GUIDANCE-DOCUMENTS-FOR-THE-FOOD-BUSINESSES.html

A.4. Environmental Management Plan for Packaged food processing industry

A.4.1. Project baseline information/ screening checklist:

S No	Section	Requirements
1	Registration, licenses and permissions	*Consent to Operate/No Objection Certificate:* • Have you applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________ *FSSAI License/Registration:* • Have you applied for/obtained the FSSAI License/Registration? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________ *Shops & Establishment Certificate:* • Have you applied for/obtained Shops & Establishment Certificate? (Yes/No) • If No, when do you plan to obtain the same Please mention duration: ________________________________

2	Basic and environmental baseline information of the unit	Full name of the applicant: (Occupier of the unit) Designation: Full Name of the Unit: Factory address with Pin Code: Survey Number Village Taluk District Mobile Number: Email ID:

Extent of land (in Hectares): (Owned/Leased) Total
area:
Build up area:

Nature of work (Continuous/Seasonal):

In case of seasonal work, please mention the months of operations:

Production capacity (T/m or KL/m or Nos/m):

Average water consumption (in KL/m):

Average electricity consumption:

Details of raw material used:

S No	Name of the raw material	Quantity	T/m or KL/m or Nos/m	Principal use

Details of fuel used:

S No	Type of fuel	Point of Use	Quantity in T/d or KL/d

Details of products manufactured:

S No	Name of the product	Quantity	T/m or KL/m or Nos/m	End use
	Products			

				Byproducts				
				Intermediate products				

Manufacturing process with a list of equipment/machinery used:

Details of sewage/effluent generation and disposal:

Outlet No	Description of Outlet (Indicate sewage or trade effluent)	Maximum daily discharge in KLD	Mode of disposal
	Sewage		
	Trade effluent		

Details of Non-hazardous Solid Waste generated by the unit:

S No	Nature of Solid Waste	Quantity (T/month)	Mode of disposal

Details of Hazardous Wastes generated by the unit

S No	Category No	Name of the waste	Quantity (T/A)	Mode of disposal

Details of emission/noise sources:

	Source		Material of	Stack details	

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<tr><th>S No</th><th></th><th>Control Measures</th><th>Construction</th><th>Diameter in M</th><th>Height above GL in Metres</th><th>Exit gas velocity in m/s</th><th>Exit gas temp in oC</th><th>Maximum discharge in M3/hr</th><th>Fan/blower/pump capacity</th></tr>
<tr><td colspan="10">1. Point sources of Emission</td></tr>
<tr><td></td><td>DG sets</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Boiler</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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<td>Implementing EMP guidelines – Packaged food sector</td>
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Design and Facilities:

The establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
There should not be any stagnant water surrounding the facility. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The building of the establishment shall provide sufficient protection against the entry and harbourage of rodent, insects, animals etc. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The establishment shall have signboards directing the employees to wash and sanitize hands before entering and after each absence. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The premises shall be free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
The door shall be easy to clean, shall be close-fitting and with suitable precautions to prevent entry of pests and in case it has gaps between the door and the floor, it should be closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry. Wooden doors are not recommended as it promotes mould growth, termites with ageing. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________
External opening windows, roof vents or exhaust fan, where present, shall be adequately screened to avoid any external pest ingress. (Yes/No)
If No, when do you plan to mitigate the same
Please mention duration: ________________________________

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		Control of Operation:

			▯ All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ The finished products shall be stored in covered containers in the chiller at 4°C and below. It shall be ensured that it is stored on separate shelves above raw food (including shell eggs). (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ All the containers for storing raw materials shall be kept covered. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Food colours and additives should be used within the safe limits prescribed in FSS Act 2006. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Fruit cuts should be washed with ozonized water before use. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Potassium sorbate to be dissolved thoroughly in water before use. Only freshly prepared sorbate solution to be used. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ The Storage of raw materials, ingredients, work-in-progress and processed/packed food products shall be subject to FIFO (First in, First out) stock rotation system as applicable. To meet this, adequate stock rotation systems should be in place. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ All packaged raw materials shall be checked for 'expiry date'/'best before'/'use by date', packaging integrity and storage conditions. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

		▯ The incoming vehicles that bring the raw materials, shall be checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________ ▯ Food handlers will be vaccinated against the enteric group of diseases as per recommended schedule of the vaccine and a records shall be maintained. (Yes/No)

		If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Where water filters are used, they shall be regularly monitored or effectively maintained. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment room shall be available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • The ambient room used for cooling cakes should be clean & dry and mopping of floor to be done with 500ppm hypochlorite solution at least once in each shift. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Temperature of cake slabs at the time of packing out from the Slab cooling room should be within the range of 14 – 190C. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Packing room temperature should be maintained at 22-24 deg Centigrade. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Packers handling naked cakes should use sterilized gloves. Disinfectant solutions to be used by all packers as and when required. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Slicer blades & conveyor belts should be sterilized with isopropyl alcohol at least 3 times in each shift or as & when required. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Waste Management and Disposal:*** • Containers for holding garbage shall be of adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect. It should be kept closed, preferably foot operated. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

		• Waste shall be segregated into wet and dry garbage and shall be removed periodically. (Yes/No) If No, when do you plan to mitigate the same

		Please mention duration: ________________________________ ***Testing and Quality Assurance:*** • Potable water quality shall be as specified in the latest edition of BIS standard on drinking water (IS 10500). Potable water shall be analyzed at least semiannually to confirm that it meets the requirements of this standard. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Quality control programme shall be in place to include inspection and testing of incoming raw materials and finished products. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Packaging:*** • Printed packaging materials shall be stored in safe, separate and secured manner. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • All materials and product should be clearly marked with their relevant Identification/ Lot Number, if possible, barcoding system should be developed. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • Only Food grade packaging materials shall be used. Packaging materials like aluminium, tin and plastic shall conform to the Indian standards as mentioned under the FSS Regulations. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ***Traceability:*** • The enterprise shall maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ • The enterprise shall maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability. (Yes/No) If No, when do you plan to mitigate the same

		Please mention duration: ______________________________
4	EMP guidelines for occupational	The establishment shall have adequate lighting and ventilation and light fixtures shall be protected with proper covering. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ______________________________

	Health & Safety	▯ The establishment's floor shall be non-slippery, sloped appropriately, to allow adequate drainage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ The establishment's floor shall be maintained in good repair with no cracks and crevices. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Necessary industrial safety precautions shall be taken to avoid mishaps occurring due to fire/refrigerant gas leakage. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Sufficient number and separate toilets/urinals for male and female should be provided. Industry best practice of 1:25 is followed for facility: employee ratio. Lavatories shall be separate from other areas and shall not be directly connected to the storage and manufacturing areas. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ Personal protective equipment for the workforce, where required, shall be used for worker's safety. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________ ▯ A fire NOC shall be obtained. All the necessary firefighting equipment shall be installed and trainings will be imparted to the workforce. (Yes/No) If No, when do you plan to mitigate the same Please mention duration: ________________________________

S No	Section	Requirement / guidelines

1	Quality inspection of incoming material	• All raw material, processing aids, ingredients consignments shall be procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities. • An approved vendor should be evaluated as per the quality supplied and other relevant factors • All raw materials, ingredients and packing material and processing aids, wherever applicable, shall be inspected and sorted before processing. The manufacturer shall have procedures in place to confirm that the incoming materials meet the documented specifications through certificate of analysis, visual inspection, laboratory testing, review of label for allergens etc. • Incoming vehicles should be checked for cleanliness and also for any source of possible contamination Records of incoming raw materials should be maintained

A.4.2. *Best practice guidelines to be circulated to the food industry owner:*

The following are some of the best practice guidelines for enhancing the performance and competitiveness of the packaged food processing enterprises under the IFPVAP scheme.

S No	Section	Requirement / guidelines
2	Storage of raw material, interim product and final produce	• Raw materials, ingredients, packing material and finished goods shall be stored separately on pallets in clean, dry, well ventilated spaces protected from dust, condensation, fumes, odors or other sources of contamination • Periodic visual checks should be made of all pallets, racks and other storage infrastructure, w.r.t structural integrity and infestations Storage area temperatures shall be maintained and monitored regularly
3	Ongoing quality inspection	• Intermediate in-process samples to be tested for critical parameters and their test results shall be maintained • Process water, steam and drinking water should conform to potability standard (IS 10500) • Preventive maintenance of equipment and machinery shall be carried out regularly as per the instructions of the manufacturer
4	Waste management	• All product waste and other waste materials shall be removed regularly from the places where the products are handled, or processed or packed. • Adequate drainage and waste disposal systems and facilities shall be designed and constructed so that the risk of contaminating packaged food products or potable water supply is avoided • Drains shall be equipped with appropriate traps • Segregation of non-biodegradable waste like plastics /metals / glass materials, bags, containers should be done, before disposal Waste disposal shall be done in accordance with local rules and regulations in a hygienic manner
5	Pest control and infestation prevention	• Windows, doors and ventilation openings shall be designed to minimize pest entry • The pest control will be carried out with permissible chemical, physical or biological agents, within the appropriate limits. Records of pesticides/insecticides used shall be maintained to show the type, quantity and concentrations used; where, when and how applied, and the target pest

6	Employee health and hygiene	• Food product handlers of the manufacturing facility shall undergo a medical examination by a registered medical practitioner before joining for work and thereafter annually • Food handlers must wear clean and washable or disposable overclothing (including headgear, nose mask, shoe cover and where appropriate, neckcovering and/or beard snood) • Personal effects such as jewelry, watches, pins, perfumes or other items should not be worn or brought into food handling areas if they pose a threat to the safety and suitability of food • Work wear shall provide adequate coverage to ensure that hair, perspiration, etc. cannot contaminate the product • Each new employee should receive training upon employment. This training should be repeated, modified or extended as required
7	Product labelling	• All packaged food products shall carry a label and requisite information as per provisions of Food Safety and Standards Act, 2006 • This should also include information that identifies food allergens in the product as ingredients
8	Monitoring and review	FBO shall also undertake a complete review of the systems including self- evaluation results, customer feedback, complaints, new technologies and regulatory updates at periodic intervals, but at least once in a year for continual improvement
9	Product traceability and recall	• Batch wise production and sale records needs to be maintained • Damaged/ returned goods should be placed in a designated area, labelled and physically segregated for appropriate disposal. • Records for such returned or recalled materials, with action taken, shall be properly maintained as per the FSSR recall regulation 2017

A.4.3. Auditor's checklist for monitoring and evaluation:

The following checklist is to be used at the time of monitoring of projects for inclusion under the IFPVAP scheme.
A copy of the checklist will be filled by the monitoring agency auditors and information received from the screening checklist will be verified.

S No	Section	Requirements
1	Registration, licenses and permissions	1. Has the enterprise applied for/obtained a Consent to Operate/No Objection Certificate from the State Pollution Control Board? (Yes/No) 2. Has the enterprise applied for/obtained the FSSAI License/Registration? (Yes/No) 3. Has the enterprise applied for/obtained the Shops & Establishment Certificate? (Yes/No)
2	Baseline Environmental data	Check the following documents for the baseline assessment: 4. Six monthly environmental testing reports submitted to the State Pollution Control Board 5. Environmental Statement (Form-5) submitted to the State Pollution Control Board 6. Electricity bill for the last 3 months 7. Water bill for the last 3 months 8. Contract for the authorized waste disposal contractor with the related waste disposal paperwork

3	Implementing EMP guidelines – Packaged food sector	***Design and Facilities:*** • Does the establishment shall have clearly identified site boundaries with appropriate access control to prevent dogs, cats or other pet/stray animals from entering the premises? (Yes/No) • Is there any stagnant water surrounding the facility? (Yes/No) • Does the building of the establishment provide sufficient protection against the entry and harbourage of rodent, insects, animals etc? (Yes/No) • Does the establishment have signboards directing the employees to wash and sanitize hands before entering and after each absence? (Yes/No) • Is the premises free of flaking paint and plaster to prevent the accumulation of dust, minimize condensation, and shredding of particles? (Yes/No) • Is the door easy to clean, close-fitting and with suitable precautions to prevent entry of pests? (Yes/No) • In case the door has gaps between the door and the floor, is it closed with suitable material like rubber strips, polyurethane etc. to avoid pest entry? (Yes/No) • Are wooden doors being used at the enterprise? (Yes/No) • Are the external opening windows, roof vents or exhaust fan, where present, adequately screened to avoid any external pest ingress? (Yes/No) ***Control of Operation:***
		□ Is all the raw material, processing aids, ingredients consignments procured from the vendors approved by FSSAI/FDA/ Ayush and registered or licensed from other regulatory authorities? (Yes/No) □ Is the finished products stored in covered containers in the chiller at 4°C and below? Is it ensured that it is stored on separate shelves above raw food (including shell eggs)? (Yes/No) □ Do all the containers for storing raw materials kept covered? (Yes/No) □ Is food colours and additives used within the safe limits prescribed in FSS Act 2006? (Yes/No)

		- Do the fruit cuts washed with ozonized water before use? (Yes/No) - Potassium sorbate to be dissolved thoroughly in water before use. Does only freshly prepared sorbate being used? (Yes/No) - Is the storage of raw materials, ingredients, work-in-progress and processed/packed food products subject to FIFO (First in, First out) stock rotation system as applicable? To meet this, does the adequate stock rotation systems is in place? (Yes/No) - Does all packaged raw materials checked for 'expiry date'/'best before'/'use by date', packaging integrity and storage conditions? (Yes/No) - Are the incoming vehicles that bring the raw materials, checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material? (Yes/No) - Is the incoming vehicles that bring the raw materials, checked for cleanliness and hygiene i.e. the trucks are clean, with no pests or dirt, with no strong odour other than that of the raw material? (Yes/No) - Are the food handlers vaccinated against the enteric group of diseases as per recommended schedule of the vaccine? Are the records maintained? (Yes/No) - Is the refrigeration system equipped with necessary temperature gauges, pressure gauges, strainers and filters to ensure smooth and efficient operations? (Yes/No) - Are the gauges and control devices functions and calibrated periodically? (Yes/No) - Where water filters are used, are they regularly monitored or effectively maintained? (Yes/No) - Are personnel hygiene facilities including - hand washing, lavatories, changing facility, rest and refreshment available to ensure that an appropriate degree of personal hygiene can be maintained to avoid any cross contamination? (Yes/No) - Is the ambient room used for cooling cakes clean & dry and mopping of floor is being done with 500ppm hypochlorite solution at least once in each shift? (Yes/No) - Does the temperature of cake slabs at the time of packing out from the Slab cooling room within the range of 14 – 190C? (Yes/No)

		• Is the packing room temperature maintained at 22-24 deg Centigrade? (Yes/No) • Do packers handling naked cakes use sterilized gloves? Is disinfectant solutions used by all packers as and when required? (Yes/No) • Is the slicer blades & conveyor belts sterilized with isopropyl alcohol at least 3 times in each shift or as & when required? (Yes/No) ***Waste Management and Disposal:*** • Does the containers for holding garbage adequate size, made of impervious material, leak-proof, clearly identified, easy to clean, and to disinfect? • Is it kept closed, preferably foot operated? (Yes/No) • Is the waste segregated into wet and dry garbage and removed periodically? (Yes/No) ***Testing and Quality Assurance:*** • Is the potable water tested for BIS standard for IS 10500? (Yes/No) • Is the potable water analyzed at least semi-annually to confirm that it meets the requirements of this standard? (Yes/No) • Is there a quality control programme in place to include inspection and testing of incoming raw materials and finished products? (Yes/No) ***Packaging:*** • Is the printed packaging materials stored in safe, separate and secured manner? (Yes/No) • Does all the materials and product clearly marked with their relevant Identification/ Lot Number? Does the unit have barcoding? (Yes/No) • Are only Food grade packaging materials used? Packaging materials like aluminium, tin and plastic conform to the Indian standards as mentioned under the FSS Regulations? (Yes/No) ***Traceability:*** • Does the enterprise maintain records of raw materials or ingredients or any other material used in processing as well as their source of procurements for traceability? (Yes/No) • Does the enterprise maintain records of finished products, as well as their batch and lot details along with the point of sale for traceability? (Yes/No)

4	EMP guidelines for occupational Health & Safety	• Did the establishment have adequate lighting and ventilation? (Yes/No) • Were the light fixtures protected with proper covering? (Yes/No)

		- Are the establishment's floor non-slippery, sloped appropriately, to allow adequate drainage? (Yes/No) - Are the establishment's floor maintained in good repair with no cracks and crevices? (Yes/No) - Does necessary industrial safety precautions taken to avoid mishaps occurring due to fire/refrigerant gas leakage? (Yes/No) - Were there sufficient number and separate toilets/urinals for male and female provided? Industry best practice of 1:25 is followed for facility: employee ratio. Was the lavatories separate from other areas and not directly connected to the storage and manufacturing areas? (Yes/No) - Wherever compressed air storage tanks are used, were they tested for pressure and structural integrity at periodic intervals? (Yes/No) - Were the workers provided with Personal protective equipment? (Yes/No) - Has the enterprise obtained a fire NOC? (Yes/No) - Does the enterprise have all the necessary firefighting equipment installed and trainings imparted to the workforce? (Yes/No)

Please note that this is an indicative list. FSSAI's FSMS guidance document covers all the regulatory as well as the suggested best practices for this food processing category. The document is available at https://archive.fssai.gov.in/home/safe-food-practices/FSMS-GUIDANCE-DOCUMENTS-FOR-THE-FOOD-BUSINESSES.html

A.5. List of food processing industries surveyed during field visits

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
1	Dairy processing	Dairy products	Punjab	Sangrur	Proprietorship	Paneer, butter, khoya, desi ghee, lassi, dahi	No	No	No	No	2
2	Dairy processing	Dairy products	Punjab	Sangrur	Proprietorship	Paneer, butter, khoya, desi ghee, lassi, dahi, kulfi (seasonal)	Yes	No	No	No	1
3	Dairy processing	Dairy products	Punjab	Sangrur	Proprietorship	Cheese, butter, ghee, cream, etc.	Yes	No	No	No	6
4	Dairy processing	Dairy products	Punjab	Sangrur	Proprietorship	Paneer, butter, khoya, desi ghee, lassi, dahi	No	No	No	No	5
5	Dairy processing	Dairy products	Punjab	Moga	Sole	Paneer, butter, lassi, dahi	No	No	No	No	0
6	Dairy processing	Dairy products	Punjab	Moga	Sole	Paneer, butter, khoya, desi ghee, lassi, dahi	Yes	No	No	No	3
7	Dairy processing	Dairy products	Punjab	Moga	Sole	Paneer, butter, khoya, desi ghee, lassi, dahi	No	No	No	No	1
8	Dairy processing	Dairy products	Punjab	Moga	Sole	Paneer, butter, khoya, desi ghee, lassi, dahi	Yes	No	No	No	5
9	Dairy processing	Ice cream	Punjab	Moga	Sole	Ice-cream	No	No	No	No	4
10	Dairy processing	Ice cream	Punjab	Moga	Sole	Kulfi	No	No	No	No	4
11	Dairy processing	Dairy products	Uttar pradesh	Aligarh	Proprietorship	Khoya, paneer, dahi, milk	Yes	No	No	No	3
12	Dairy processing	Dairy products	Uttar pradesh	Aligarh	Proprietorship	Khoya, paneer, dahi, milk	Yes	No	Yes	No	2
13	Dairy processing	Dairy products	Uttar pradesh	Aligarh	Proprietorship	Khoya, paneer, dahi, milk	Yes	No	No	No	14
14	Dairy processing	Dairy products	Uttar pradesh	Aligarh	Proprietorship	Khoya, paneer, dahi, milk, cream	Yes	Yes	Yes	No	5
15	Dairy processing	Ice cream	Uttar pradesh	Aligarh	Rented space	Ice cream	Yes	No	No	No	0
16	Dairy processing	Dairy products	Uttar pradesh	Fatehpur	Partnership	Milk	Yes	Yes	No	No	7

17	Dairy processing	Ice cream	Uttar pradesh	Fatehpur	Proprietorship	Ice-cream	No	No	No	No	12
18	Dairy processing	Ice cream	Uttar pradesh	Fatehpur	Proprietorship	Ice-cream	No	No	No	No	2

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
19	Dairy processing	Ice cream	Uttar pradesh	Fatehpur	Family business	Ice cream	Yes	No	No	No	10
20	Dairy processing	Dairy products	Maharashtra	Nashik	Proprietorship	Ghee,butter milk, curd	No	No	No	No	3
21	Dairy processing	Dairy products	Maharashtra	Nashik	Proprietorship	Paneer, sweets, khoa	No	No	Yes	No	5
22	Dairy processing	Dairy products	Maharashtra	Nashik	Proprietorship	Paneer, ghee, curd, packaged milk	Yes	No	No	No	3
23	Dairy processing	Dairy products	Maharashtra	Nashik	Proprietorship	Ghee,curd	Yes	No	No	No	2
24	Dairy processing	Dairy products	Maharashtra	Nashik	Proprietorship	In process to set up processing for ghee,paneer, milk & curd products	No	No	No	No	6
25	Dairy processing	Dairy products	Maharashtra	Washim	Proprietorship	Milk, curd, panner, khoya	No	No	No	No	5
26	Dairy processing	Dairy products	Maharashtra	Washim	Proprietorship	Panner,curd, milk, srikhand	No	No	No	No	0
27	Dairy processing	Dairy products	Maharashtra	Washim	Proprietorship	Milk, panner, khoya, peda	Yes	No	No	No	7
28	Dairy processing	Dairy products	Maharashtra	Washim	Proprietorship	Sweets	Yes	No	No	No	8
29	Dairy processing	Dairy products	Maharashtra	Washim	Proprietorship	Paneer, curd, lassis, srikhand, sweets	Yes	No	No	No	12
30	Dairy processing	Ice cream	Maharashtra	Washim	Proprietorship	Ice cream, kulfi	Yes	No	No	No	3
31	Dairy processing	Ice cream	Maharashtra	Washim	Proprietorship	Ice cream, kulfi	Yes	No	No	No	3

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
32	Dairy processing	Ice cream	Maharashtra	Washim	Proprietorship	Ice cream, kulfi	Yes	No	Yes	No	5
33	Dairy processing	Dairy products	Andhra pradesh	Prakasham	Proprietorship	Sweets, khoa, mysore pak, laddu, sonpapdi, halva	No	No	No	No	5
34	Fruits and Vegetables Processing	Pickle	Punjab	Sangrur	SHG Owned	Pickles	Yes	No	No	No	4
35	Fruits and Vegetables Processing	Pickle	Punjab	Sangrur	Proprietorship	Sherbet, pickels	Yes	No	No	No	10
36	Fruits and Vegetables Processing	Pickle	Punjab	Moga	Sole	Pickels, murabba, ketchup, sherbet, squash, vinegar	Yes	No	No	No	12
37	Fruits and Vegetables Processing	Pickle	Punjab	Moga	Sole	Pickels, murabba, sherbet, vinegar	Yes	No	No	No	4
38	Fruits and Vegetables Processing	Pickle	Punjab	Moga	Sole	Sherbet, squash, achar, murabba	Yes	No	No	No	2
39	Fruits and Vegetables Processing	Pickle	Punjab	Moga	Sole	Pickels, murabba, ketchup, sherbet, lemon juice, vinegar	Yes	No	No	No	2
40	Fruits and Vegetables Processing	Pickle	Punjab	Moga	SHGWomen Group	Pickles, syrups, chutney,	Yes	No	No	No	2
41	Fruits and Vegetables Processing	Pickle	Uttar Pradesh	Aligarh	Sole	Pickles, Murraba	No	No	No	No	2
42	Fruits and Vegetables Processing	Pickle	Uttar Pradesh	Aligarh	SHG	Pickle	No	No	No	No	13

43	Fruits and Vegetables Processing	Pickle	Uttar Pradesh	Aligarh	SHG	Pickle	No	No	No	No	12
44	Fruits and Vegetables Processing	Pickle	Uttar Pradesh	Fatehpur	Proprietorship	Pickle and Murabba	Yes	No	No	No	5
45	Fruits and Vegetables Processing	Pickle	Uttar Pradesh	Fatehpur	Proprietorship	Pickle and Murabba	Yes	No	No	No	1
46	Fruits and Vegetables Processing	Pickle	Uttar Pradesh	Fatehpur	Proprietorship	Pickles, Aawla candy and Murabba	Yes	NO	Yes	No	10
47	Fruits and Vegetables Processing	Pickle	Uttar Pradesh	Fatehpur	SHG Owned	Pickle, Sauce, Squash, Jam and Muraba	No	NO	No	No	*

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
48	Fruits and Vegetables Processing	Pickle	Maharashtra	Washim	SHG	Achar, ambla candy, masale, papad	Yes	No	No	No	14
49	Fruits and Vegetables Processing	Pickle	Maharashtra	Washim	SHG	Pickle	No	No	No	No	5
50	Fruits and Vegetables Processing	Pickle	Maharashtra	Washim	Proprietorship	Massala, papad, achar, muraba	NO	No	No	No	0
51	Fruits and Vegetables Processing	Pickle	Andhra Pradesh	Vizianagaram	Self	Mango pickle (Spicy & Sweet), Tomato pickle, ginger pickle, lemon pickle, rice papad, badi	No	No	No	No	5
52	Fruits and Vegetables Processing	Pickle	Andhra Pradesh	Vizianagaram	Proprietorship	Pickle (Chicken, Prawn, Mango, tomato etc.)	No	No	Yes	No	6

53	Fruits and Vegetables Processing	Pickle	Andhra Pradesh	Prakasham	Proprietorship	Mushroom, Mushroom Pickles, Mushroom papad	No	No	No	No	1
54	Fruits and Vegetables Processing	Pickle	Andhra Pradesh	Prakasham	Proprietorship	10 types of Pickles	No	No	No	No	2
55	Fruits and Vegetables Processing	Jaggery	Maharashtra	Nashik	Proprietorship	Organic Jaggery	No	No	No	No	9
56	Fruits and Vegetables Processing	Jaggery	Maharashtra	Nashik	Proprietorship	Jaggery	Yes	NO	No	No	1
57	Fruits and Vegetables Processing	Vegetables	Uttar Pradesh	Fatehpur	Proprietorship	Canned Mushroom	Yes	NO	Yes	No	3
58	Fruits and Vegetables Processing	Vegetables	Maharashtra	Nashik	Proprietorship	Maual	No	No	No	No	9
59	Fruits and Vegetables Processing	Vegatables	Maharashtra	Nashik	Proprietorship	The raw vegetables are dried in sun and then crushed and powdered. The powder is then sold in market	Yes	No	No	No	6

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
60	Grains and Oilseeds	Milling	Punjab	Sangrur	Proprietorship	Flour, Rice, Mustard oil	No	No	No	No	0
61	Grains and Oilseeds	Milling	Punjab	Sangrur	Proprietorship	Wheat flour, multigrain flour, mustard oil	No	No	No	No	0
62	Grains and Oilseeds	Milling	Punjab	Sangrur	Partnership	Wheat flour	No	No	No	No	3
63	Grains and Oilseeds	Milling	Punjab	Sangrur	Proprietorship	Wheat flour, multigrain flour, besan, mustard oil	No	No	No	No	3
64	Grains and Oilseeds	Milling	Punjab	Sangrur	Rented	Wheat flour, multigrain flour, mustard oil	No	No	No	No	2

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
65	Grains and Oilseeds	Milling	Punjab	Sangrur	Proprietorship	Wheat flour, multigrain flour, mustard oil	No	No	No	No	0
66	Grains and Oilseeds	Milling	Punjab	Sangrur	SHG Owned	Spices	Yes	No	No	No	4
67	Grains and Oilseeds	Milling	Punjab	Sangrur	Proprietorship	Canola oil	Yes	No	No	No	2
68	Grains and Oilseeds	Milling	Punjab	Moga	Sole	Flour, Dalia, cattle feed	No	No	No	No	0
69	Grains and Oilseeds	Milling	Punjab	Moga	Sole	Wheat flour, multigrain flour, besan, mustard oil, rice, cattle feed	No	No	Applied for	No	7
70	Grains and Oilseeds	Milling	Punjab	Moga	Partnership	Besan, mustard oil	Yes	No	No	No	20
71	Grains and Oilseeds	Milling	Punjab	Moga	Proprietorship	Flour,Spice, Mustard oil	No	No	No	No	3
72	Grains and Oilseeds	Milling	Punjab	Moga	Joint family business	Besan, wheat flour, multigrain flour, spices (turmeric, chilli, garam masala), rice	Yes	No	Yes	No	0
73	Grains and Oilseeds	Milling	Punjab	Moga	Partnership	Flour,Spice,Besan,Mustard oil	Yes	No	No	No	4
74	Grains and Oilseeds	Milling	Punjab	Moga	Proprietorship	Flour,Spice,Rice,Mustard oil	No	Yes	No	No	4
75	Grains and Oilseeds	Milling	Uttar Pradesh	Aligarh	Proprietorship	Mustard Oil	Yes	Yes	Yes	No	3
76	Grains and Oilseeds	Milling	Uttar Pradesh	Aligarh	Proprietorship	Flour and mustard oil	Yes	No	Yes	No	3
77	Grains and Oilseeds	Milling	Uttar Pradesh	Aligarh	Proprietorship	Mustard Oil	Yes	Yes	Yes	No	3
78	Grains and Oilseeds	Milling	Uttar Pradesh	Aligarh	Proprietorship	Flour and mustard oil	Yes	No	Yes	No	3

79	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietary	Oil mill and Flour mill	Yes	NO	No	No	2
80	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietary	Rice mill	Yes	NO	Yes	No	25
81	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietary	Oil mill and Flour mill	Yes	NO	No	No	2
82	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietary	Oil mill and Flour mill	Yes	NO	No	No	1
83	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietorship	Flour (packed in 50 kg bags)	Yes	NO	Yes	No	2
84	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Partnership	Rice	Yes	No	No	No	46
85	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietary	Oil mill	Yes	NO	No	No	15
86	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietary	Oil mill and Flour mill	Yes	NO	No	No	10
87	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Proprietary	Oil mill	Yes	NO	No	No	3
88	Grains and Oilseeds	Milling	Uttar Pradesh	Fatehpur	Partnership	Rice	Yes	Yes	No	No	2
89	Grains and Oilseeds	Milling	Maharashtra	Nashik	Proprietorship	Rice, Rice tusk and Rice polish	No	No	No	No	3
90	Grains and Oilseeds	Milling	Maharashtra	Nashik	Proprietorship	Nirgudi oil and Ragi papad	NO	No	No	No	0
91	Grains and Oilseeds	Milling	Maharashtra	Nashik	Proprietorship	Groundnut oil, sesame oil, coconut oil and flaxseed oil	No	No	No	No	0
92	Grains and Oilseeds	Milling	Maharashtra	Nashik	Proprietorship	Groundnut oil, sesame oil, coconut oil and flaxseed oil	No	No	No	No	20
93	Grains and Oilseeds	Milling	Maharashtra	Nashik	Proprietorship	Groundnut oil, sesame oil, coconut oil and flaxseed oil	Yes	No	No	No	1
94	Grains and Oilseeds	Milling	Maharashtra	Nashik	Proprietorship	Rice and Rice husks	No	No	No	No	8
95	Grains and Oilseeds	Milling	Maharashtra	Washim	Proprietorship	Ground nut oil, sunflower oil	Yes	NO	Yes	No	2
96	Grains and Oilseeds	Milling	Maharashtra	Washim	Proprietorship	Dals	No	No	Yes	No	8

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
97	Grains and Oilseeds	Milling	Maharashtra	Washim	Proprietorship	Dal, wheat	NO	No	Yes	No	2
98	Grains and Oilseeds	Milling	Andhra Pradesh	Prakasham	Proprietorship	Multi grain powder, Ragi, Jowar, Perrel Millet,White Jowar	Yes	No	No	No	3
99	Grains and Oilseeds	Soya products	Punjab	Sangrur	Proprietorship	Tofu, Soya Milk	Yes	No	No	No	2
100	Grains and Oilseeds	Soya products	Punjab	Sangrur	Proprietorship	Soya Tofu, Soya milk (strawberry, elaichi, etc.)	Yes	No	Yes	No	2
101	Grains and Oilseeds	Soya products	Punjab	Sangrur	Proprietary	Tofu (Soya Paneer)	Yes	No	No	No	3
102	Grains and Oilseeds	Spices	Punjab	Sangrur	Proprietorship	Spices	No	No	No	No	2
103	Grains and Oilseeds	Spices	Punjab	Sangrur	Proprietorship	Organic Turmeric powder	No	No	No	No	8
104	Grains and Oilseeds	Spices	Punjab	Sangrur	SHG Owned	Spices	Yes	No	No	No	8
105	Grains and Oilseeds	Spices	Punjab	Sangrur	Proprietorship	Chilli garlic onion paste	Yes	No	No	No	7
106	Grains and Oilseeds	Spices	Punjab	Moga	Partnership	Biscuits, spices	Yes	No	No	No	3
107	Grains and Oilseeds	Spices	Punjab	Moga	Proprietorship	Spice	No	No	No	No	3
108	Grains and Oilseeds	Spices	Punjab	Moga	Partnership	Spice	Yes	No	No	No	9
109	Grains and Oilseeds	Spices	Punjab	Moga	Proprietorship	Spice	No	Yes	No	No	8
110	Grains and Oilseeds	Spices	Uttar Pradesh	Fatehpur	Family run	Spices (Haldi, Chilly and Dhaniya)	No	NO	No	No	4
111	Grains and Oilseeds	Spices	Uttar Pradesh	Fatehpur	SHG Owned	Spices (Haldi, Chilly and Dhaniya) and Bari	No	NO	No	No	17
112	Grains and Oilseeds	Spices	Maharashtra	Nashik	Proprietorship	Fried Onion	No	No	Yes	No	4

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
113	Grains and Oilseeds	Spices	Maharashtra	Nashik	Proprietorship	Turmeric powder, Beetroot powder, Curry leaves powder, Papaya powder	No	No	No	No	4
114	Grains and Oilseeds	Spices	Maharashtra	Washim	Proprietorship	Papad, Vadi, Savai, Masala, floor, dal	Yes	No	No	No	2
115	Grains and Oilseeds	Spices	Maharashtra	Washim	Proprietorship	Papad, Vadi, Savai, Masala	Yes	No	No	No	8
116	Grains and Oilseeds	Spices	Maharashtra	Washim	Proprietorship	Massala, papad, achar, muraba	NO	No	No	No	3
117	Grains and Oilseeds	Spices	Maharashtra	Washim	Proprietorship	Masala, mirchi, haldi	NO	No	No	No	7
118	Grains and Oilseeds	Spices	Maharashtra	Washim	SHG	Masala	No	No	No	No	2
119	Grains and Oilseeds	Spices	Andhra Pradesh	Prakasham	Proprietorship	Chilly Powder, Cerpow skotch Powder	No	No	No	No	1
120	Packaged food	Bakery	Punjab	Sangrur	Proprietary	Bakery & confectionery items	No	No	No	No	4
121	Packaged food	Bakery	Punjab	Sangrur	Proprietorship	Biscuits, cakes, patties, kulche, bun	Yes	No	No	No	3
122	Packaged food	Bakery	Punjab	Sangrur	Proprietorship	Biscuits, buns, patties, pastry	No	No	No	No	2
123	Packaged food	Bakery	Punjab	Sangrur	Proprietorship	Biscuits, buns, patties, pastry	Yes	No	No	No	6
124	Packaged food	Bakery	Punjab	Moga	Sole	Biscuits, pizza base, pao, kulche, bun	Yes	Yes	No	No	2
125	Packaged food	Bakery	Punjab	Moga	Partnership	Biscuits, spices	Yes	No	No	No	20
126	Packaged food	Bakery	Punjab	Moga	Proprietorship	Bakery & confectionery items	Yes	No	No	No	2
127	Packaged food	Bakery	Punjab	Moga	Sole	Biscuits, cakes, pao, kulche, bun, hotdog	Yes	No	No	No	9
128	Packaged food	Bakery	Punjab	Moga	Sole	Bun, patties, bread	Yes	No	Yes	No	4
129	Packaged food	Bakery	Punjab	Moga	Sole	Bun, cream-roll, patties, biscuits	No	No	Yes	No	10

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
130	Packaged food	Bakery	Uttar pradesh	Aligarh	Proprietorship	Biscuits and rusks	Yes	No	No	No	8
131	Packaged food	Bakery	Uttar pradesh	Aligarh	Sole	Matri, rusk	No	No	No	No	5
132	Packaged food	Bakery	Uttar pradesh	Aligarh	Sole	Biscuits, rusks	Yes	Yes	Yes	No	25
133	Packaged food	Bakery	Uttar pradesh	Aligarh	Proprietorship	Cookies, rusk and fan	Yes	No	No	No	10
134	Packaged food	Bakery	Uttar pradesh	Fatehpur	Proprietary	Bun	Yes	No	Yes	No	10
135	Packaged food	Bakery	Uttar pradesh	Fatehpur	Proprietorship	Bread and buns	Yes	No	No	No	7
136	Packaged food	Bakery	Uttar pradesh	Fatehpur	Private limited	Brea, bun and rusk	Yes	Yes	No	No	24
137	Packaged food	Bakery	Uttar Pradesh	Fatehpur	Proprietorship	Bun, rusk and biscuit (Bakery)	Yes	NO	Yes	No	8
138	Packaged food	Bakery	Maharashtra	Washim	Proprietorship	Cakes, toast, pav	Yes	No	Yes	No	3
139	Packaged food	Bakery	Maharashtra	Washim	Proprietorship	Cake, bread, biscuit	Yes	No	No	No	2
140	Packaged food	Bakery	Maharashtra	Washim	Proprietorship	Cake, Bread, Rusk	No	No	No	No	15
141	Packaged food	Bakery	Andhra pradesh	Vizianagaram	Self	Bakery and confectionary laddoo jaggery mysore pak boondi mixture normal mixture khoya	No	No	No	No	2
142	Packaged food	Papad	Maharashtra	Nashik	Proprietorship	Papad and sewai	No	No	No	No	0
143	Packaged food	Papad	Maharashtra	Nashik	Proprietorship	Nirgudi oil and ragi papad	No	No	No	No	0
144	Packaged food	Papad	Maharashtra	Washim	Proprietorship	Papad and dal snacks	Yes	No	No	No	1

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
145	Packaged food	Papad	Maharashtra	Washim	Proprietorship	Papad, Vadi, Savai, Masala, floor, dal	Yes	No	No	No	0
146	Packaged food	Papad	Maharashtra	Washim	Proprietorship	Papad, mirchi, halad, ata	Yes	No	No	No	4
147	Packaged food	Papad	Maharashtra	Washim	Proprietorship	Papad, vadi, savai, masala	Yes	No	No	No	3
148	Packaged food	Papad	Maharashtra	Washim	Proprietorship	Massala, papad, achar, muraba	No	No	No	No	4
149	Packaged food	Papad	Maharashtra	Washim	Shg	Papad	No	No	No	No	10
150	Packaged food	Papad	Andhra pradesh	Vizianagaram	Proprietorship	Papad	No	No	No	No	6
151	Packaged food	Papad	Andhra pradesh	Vizianagaram	Proprietorship	Papad	No	No	No	No	2
152	Packaged food	Papad	Andhra pradesh	Vizianagaram	Self	Coconut laddoo, chikodu, papads	No	No	No	No	5
153	Packaged food	Papad	Andhra pradesh	Vizianagaram	Proprietorship of the same family	Papad, baddi (mung daal), rice starch papad	No	No	No	No	2
154	Packaged food	Snacks	Punjab	Sangrur	Proprietorship	Namkeen, gajak	Yes	No	No	No	5
155	Packaged food	Snacks	Punjab	Sangrur	Proprietorship	Namkeen, biscuit, gajak (seasonal)	Yes	No	No	No	6
156	Packaged food	Snacks	Punjab	Sangrur	Proprietorship	Patisa and son papadi	No	No	Yes	No	11
157	Packaged food	Snacks	Punjab	Moga	Sole	Namkeen, gajak	Yes	No	Yes	No	9
158	Packaged food	Snacks	Uttar pradesh	Aligarh	Proprietorship	Mathri	No	No	Yes	No	3
159	Packaged food	Snacks	Maharashtra	Washim	Proprietorship	Pani Puri	NO	No	No	No	2
160	Packaged food	Snacks	Maharashtra	Washim	Proprietorship	Namkeen	Yes	No	No	No	0

S. No	Category	Sub Category	State	District	Type of ownership	Products manufactured/processed	FSSAI Registered	Obtained CTO from SPCB	MSME/SSI registration Status	NoC from CGWB	Number of employees
161	Packaged food	Snacks	Andhra pradesh	Vizianagaram	Proprietorship	Chikki	No	No	No	No	5
162	Packaged food	Snacks	Andhra pradesh	Vizianagaram	Self	Pootharekulu (rice coated sheet), cashew	No	No	No	No	5
163	Packaged food	Snacks	Andhra pradesh	Vizianagaram	Proprietorship	Pootharekulu (rice coated sheet)	No	No	No	No	6
164	Packaged food	Snacks	Andhra pradesh	Vizianagaram	Self	Snacks - different kinds of mixtures (masala peanuts, chikodi)	No	No	No	No	3
165	Packaged food	Snacks	Andhra pradesh	Vizianagaram	Proprietorship	Chikodi(snacks)	No	No	No	No	1
166	Packaged food	Snacks	Andhra Pradesh	Prakasham	Proprietorship	Sweets, Khoa, Mysore pak, Laddu, sonpapdi, Halva	No	No	No	No	1
167	Packaged food	Snacks	Andhra pradesh	Prakasham	Proprietorship	Sweet, chakhna, namkeen food items	No	No	No	No	10
168	Packaged food	Snacks	Andhra pradesh	Prakasham	Proprietorship	Namkeen & snacks	No	No	No	No	10
169	Packaged food	Snacks	Andhra pradesh	Prakasham	Proprietorship	Popcorns	No	No	No	No	3
170	Packaged food	Snacks	Andhra pradesh	Prakasham	Proprietorship	Sweets, khoa,	No	No	No	No	8
171	Packaged food	Snacks	Andhra pradesh	Prakasham	Proprietorship	Ice cream nuts, butter scotch nuts	No	No	No	No	2
172	Packaged food	Snacks	Andhra pradesh	Prakasham	Proprietorship	Chikky, laddu	No	No	No	No	1

A.6. Questionnaire used during field survey regarding Environment, Health, Safety and food Safety

Questionnaire for Environmental Assessment (EA) for INDIA- Proposed India Food Processing and Value Addition Programme [IFVAPP]: GRAM SAMRIDHI YOJANA

Name of the surveyor:_______________ Date:____________________ Time:_____________________

QUESTIONNAIRE	
Section 1- About the unit	
a. Name of the unit/representative, the address and the contact number:	**b. Owner's details: Age** **_____________ : Education** **_____________ : Marital Status**
c. Year of establishment: ______________________________	**d. Type of firm (Proprietorship, Partnership, SHG, unregistered):**
e. What is the land area presently required for the unit?	**f. How much land was initially acquired?**
g. Average monthly Production (Volume):	**h. Average monthly sales and profit:**
	j. Type of raw material consumption:

i. **Product manufactured/ processed:**	

k. **Association with any trade bodies:**	l. **Number of employees:**
m. **Loans/Financial assistance (Values):**	n. **Capital Investment/Details of machines:**
Category of food unit: 1. Fruit and vegetable processing 2. Meat and Poultry / seafood 3. Grains and oil seeds 4. Packaged foods including (snacks and bakeries) 5. Spices and condiments 6. Milk and Dairy Products 7. Other – please specify	**Has the unit obtained CTO from pollution control board** 1. Yes 2. No

Section 2- Value Chain Analysis *– Understanding the overall process of the production/ processing including what raw material is consumed and from where they are procured, processes carried out in the unit and where are they sold and to whom.*		
Raw material procured	*In house process*	*Forward linkages / Market linkages*

List of raw material procured: Mode of transport used in procuring: Challenges in procuring: Middle men/suppliers involved/ Negotiations	Process carried in house Process 1: Type of wastage: Process 2: Type of wastage: Process 3: Type of wastage: Process 4: Type of wastage: Process 5: Type of wastage: Equipment's/ machine used	Processed product is sold to whom Mode of transport used Support from family members/ government/ NGO's Challenges in selling Involvement of middlemen

Section3- Environmental assessment

1. What are the types of emissions/wastes generated due to processing its quantity (if available) and mitigation/disposal?

Types of emissions/wastes	Source	Emission level	Mitigation/Disposal
Air Emission			

Noise generation			
Odour			
Liquid waste/ waste water			

Solid Waste (including Organic/Inorganic & Hazardous/e-waste)			

Following Questions will be for units having consent from pollution control board

2. If the unit has obtained consent then, what are the requirements to mitigate pollution as per consent given by pollution control board? Write "NA" whichever is not applicable.
    - Air-
    - Water-
    - Solid waste-

3. If the unit has obtained consent then, what is the permissible quantity of emission? Write "NA" whichever is not applicable.
    - Air-
    - Water-
    - Solid waste-

4. Has there been regular inspection from pollution control board? If yes, then what was the last time
    - Yes
    - No

5. Have you conducted any testing of environmental components like air quality, water, effluent etc.?
    - Yes
    - No

Below questions should be ask to the units who have not obtained CTO

6. Are you aware of requirement for consent from pollution control board
    - Yes
    - No

7. Do you agree that your production process can cause environmental pollution
    - Yes
    - No

8. What are the reasons for not obtaining consent from pollution control board No pollution sources so do not require consent • Not aware of requirement of consent from pollution control board • Aware but not interested because of complex process
Below questions should be asked from all units
9. Any environmental concern caused by the unit (like contamination of nearby waterbody, agricultural field, improper dumping of waste etc.)
10. Is the worker aware of pollution being generated from their unit? • Yes • No
11. Is the owner aware of pollution being generated at the unit? • Yes • No
12. Do you think it is important for you for your business to be aware of environmental norms • Yes • No
13. Have you attended any kind of environmental awareness program or training Yes No
14. Describe from your observation the pollution prevention mechanisms adopted at the unit

<u>Section 4- Revenue Management - Understanding the challenges faced by the enterprise in revenue management</u>

1. Is the revenue continuous or seasonal? Please give explanation for the response

- Yes
- No

2. How do you manage and meet the working capital requirement? Please give explanation for the responses. (Can select multiple options which are applicable)

- Loan from bank
- Loan from family/friend
- Government funding scheme
- Loan from unorganized financial institutions
- Any others (Please specify)

3. What mode of finance do you prefer most? Please give explanation for the responses. (Can select multiple options which are applicable)

- Loan from Bank
- Loan from family
- Government funding schemes
- Any others (Please specify)

4. If you have taken loan from bank, then do they check environmental compliance?

- Yes

- ▯ No

Section 5- Access to Market

1. Who is your customer? Please mention the percentage share of consumption if there are multiple type of customer.

- ▯ Local community
- ▯ Dealers/Retailers
- ▯ Wholesalers
- ▯ Trade fare/ exhibitions
- ▯ Others

2. How are you selling the product? Please select multiple options if applicable

- ▯ Own Shop
- ▯ Online channels
- ▯ Through third party/dealers
- ▯ Self/ Family member

3. Rank the following challenges (descending order) in selling your product? Please give explanation for the response

- ▯ Logistics
- ▯ Access to markets

- Peer competition
- Quality of product
- Others (Specify)

4. Do you advertise your products? If yes what are the initiatives and investment made

- Yes
- No

Section 6- Regulatory Assessment

1. Different registration/license you have obtained/applied for?
    a. GST
    b. FSSAI
    c. Factory License (Factories act)
    d. License under Shop and establishment Act
    e. MSME/SSI registration
    f. CGWB
    g. SPCB (CTE/CTO)
    h. Any other state regulatory body registration
    i. Others (Please specify)
2. Quality mark/certification body you are accredited to/applied for? a. ISI Mark
    b. AGMARK
    c. Organic Certification and Symbols for Organic Food in India
    d. ECOMARK
    e. Others (Please specify)

3. Reason for not getting the unit registered?
    a. Not interested
    b. Not aware
    c. No incentive
    d. Others (Please specify)

4. Are you aware about the process of converting the unit from unregistered to registered? Its benefits, challenges and cost involved Registration under MSME
    Registration under FSSAI
    Registration under Factories Act

5. Have you registered your organization with any trade bodies? If yes, what are its advantages

6. Do you think certifications and associations with trade bodies help in growth of your business? Please give explanation for the response

- Yes
- No

7. What challenges do you find in registration and getting certification?

8. Have you registered your organization with any trade bodies/ association? Please give explanation for the response

- Yes
- No

9. If you are registered with any trade bodies then what kind of support do you get from them

Section 7- Quality Control – Assessing the overall quality of unit for different areas by your observation of unit. Please take sufficient photographs for the same.
1. Does the unit has an updated FSSAI license and is displayed at a prominent location.
2. Does the unit have adequate working space for the workers
3. Is adequate ventilation provided within the premises.
4. Food manufactured/processed is packed in a hygienic manner – Are all the workers wearing apron, gloves, head gear etc.
5. Cleaning chemicals & other hazardous substance are clearly identified & stored separately from food.
6. No person suffering from a disease or illness or with open wounds or burns is involved in handling of food or materials which come in contact with food.
7. Food handlers maintain personal cleanliness (clean clothes, trimmed nails &water proof bandage etc.) and personal behaviour (hand washing, no loose jewelry, no smoking, no spitting etc.).
8. Food handlers equipped with suitable aprons, gloves, headgear, shoe cover etc.; wherever necessary.
9. Provision for basic amenities to workers like a. Drinking water b. separate toilet for male & female c. first aid etc.

Observational questions (Write Yes/No)	Raw material storage	Processing/ production area	Finished goods storage area

10. Does the unit is well maintained & clean and also prevents the entry of dust, pests and dirt (rate them in the scale of 1 to 5; 1 being the best and 5 the worst)			
11. Walls, ceilings & doors are free from flaking paint or plaster, condensation & shedding particles.			
12. Floors are non-slippery & sloped appropriately.			
13. Windows are kept closed & fitted with insect proof screen when opening to an external environment.			
14. Doors are close fitted to avoid entry of pests.			
15. Premise has sufficient lighting (rate them in the scale of 1 to 5; 1 being the best and 5 the worst)			
16. Food waste and other refuse are removed periodically from food handling areas to avoid accumulation.			

Section 8- Resource Consumption
1. Quantity of water consumption per day/ month?

2. Source of water supply?
   a. Ground water
   b. Municipal water
   c. Water from water bodies (pond, river and Lake Etc.)
   d. Others
3. Do you test the potability of the water used?
   a. Yes
   b. No
4. What is the source of electricity for your unit (even during power failure)?
   a. Commercial electricity from GRID
   b. DG sets
   c. Renewable energy in form of solar panels
   d. Others
5. Any special tariff or subsidy received?
   a. Yes
   b. No

Section 9- Raw material area (Storage)

1. What type of raw material are stored in the are

- Solid
- Semi-solid
- Liquid

2. Is the raw material storage area air conditioned/cooled • Yes • No
3. Are the raw materials segregated properly • Yes • No
4. What type of utensils were used to store raw materials • Food grade plastic containers • Nonfood grade plastic containers • Metal containers • Ceramics • Others
5. What is the regular cleaning process of raw material area • Daily • Weekly • Monthly • Others
Quality checks
6. Do you check quality of incoming raw material? • Yes • No
7. How do you check quality of raw material • Physical inspection • Chemical test • Quality standard test • Others
8. Do you have adopted any standard to check quality of raw material? If yes, please explain • Yes • No

9. What is the average shelf life of your raw material
- One day
- Up to 1 week
- 1-2 week
- More than 2 weeks

10. Do you have installed any facility to preserve your raw material? If yes, please explain what are those?
- Yes
- No

11. Any instance when you faced challenge in preserving your raw material? If yes what are those challenges and how do you address those challenges?

Section 10- Packing area (Storage Finished goods)

1. What type of finished products are stored?
- Solid
- Semi-solid
- Liquid

2. Is the finished goods storage area air conditioned/cooled
- Yes
- No

3. Are the finished goods segregated properly from semi finished and scrap materials
- Yes
- No

4. <u>What type of utensils were used to store finished goods</u>
- <u>Food grade plastic containers</u>
- <u>Non food grade plastic containers</u>
- <u>Metal containers</u>
- <u>Ceramics</u>
- <u>Others</u>

5. <u>What is the regular cleaning process of finished goods area</u>
- <u>Daily</u>
- <u>Weekly</u>
- <u>Monthly</u>
- <u>Others</u>

<u>Quality checks (Quality as per food safety standard)</u>

6. <u>Do you check quality of outgoing finished product?</u>
- <u>Yes</u>
- <u>No</u>

7. <u>How do you check quality of finished product</u>
- <u>Physical inspection (Visual, smell and taste)</u>
- <u>Chemical test</u>
- <u>Quality standard test</u>
- <u>Others</u>

8. <u>Do you have adopted any standard to check quality of finished product? If yes, then what are those standards? Please explain.</u>
- <u>Yes</u>
- <u>No</u>

9. <u>What is the average shelf life of your finished product</u>
- <u>One day</u>
- <u>up to 1 week</u>
- <u>1-2 week</u>
- <u>More than 2 weeks</u>

10. Do you have installed any facility to preserve your finished product? If yes, please explain what are those?
- Yes
- No

11. Do you use pesticide and chemicals to preserve your food materials
- Yes
- No

12. If yes, are pest control activities are carried out by trained and experienced personnel. Check for records.
- Yes
- No

Section 11- Processing area

1. What process do you use to manufacture your product?

2. How many processing machines/equipment do you have. Please list all the machineries and equipment in the facility.

3. Do you require skilled person to use equipment and manufacture product? If yes, what are those skill
- Yes
- No

4. Please select the potential risks from your manufacturing process
- Fire
- Hot water/material spillage
- Minor/major mechanical accidents
- Short circuits
- Others

5. What type of wastage is generated from your manufacturing process
- Food waste
- Liquid/semi solid waste
- Packaging waste
- Chemicals
- Others

Quality checks (Process standardization)

6. Do you have any standard manufacturing process adopted?
- Yes
- No

7. Do you have obtained any certification for your manufacturing process?
- Yes
- No

8. If you have any standard manufacturing process, are the workers trained to produce as per the set standard?
- Yes
- No

9. How do you store work-in-process or semi-finished product
10. What is the shelf life of semi-finished products
- Few hours
- 1 day
- up to 1 week
- More than 1 week

11. Generally how long do you keep your semi-finished produce
- Few hours
- 1 day
- up to 1 week
- More than 1 week

12. Do you have installed any facility to preserve your semi-finished product? If yes, please explain what are those? • Yes • No
Section 12- Workers related
1. Are you happy with the skill level of workers? • Yes • No
2. What kind of skill you think workers should be given to improve your production and overall business.
3. Do you think there is need for health and safety awareness among the workers Yes No
4. Do you think your workers should use PPEs (like gloves, hair caps, shoes etc.) to protect themselves as well as product quality • Yes • No
5. What are the reasons workers are not wearing PPEs (If they are not wearing) PPEs not provided Workers are not aware
6. Do you think there is need of protective equipment like Fire extinguishers, First aid kits at your facility

• Yes • No
7. Do you conduct annual medical examination & vaccination of food handlers against the enteric group of diseases as per recommended schedule of the vaccine. Check for records. • Yes • No

8. What type of wastage is generated from your manufacturing process • Food waste • Liquid/semi solid waste • Packaging waste • Chemicals • Others
9. On the basis of your observation what was the average cleanliness level being maintained at finished goods storage area Very clean • Clean • Untidy • Very untidy

A.7. Clauses to be included in the Bid document for construction related activities

S. No	Section	Proposed clauses for inclusion in works contract
1	Protection of Environment	• The Contractor shall be responsible for implementation of environmental provisions outlined in the Environmental Management Framework or task specific environmental management plan. • The costs towards environmental management as per EMP unless otherwise provided as a separate head, will be deemed to be part of the BoQ of the project. The scope of works of the contractor towards the implementation of the environmental provisions shall be as follows: o Compliance with all existing environmental regulations and requirements of the Government of India and compliance with all mitigation measures and monitoring requirements set out in the EMF or task specific EMP o Obtain all necessary regulatory permits as required by various construction activity, before start of construction o Monitoring of project environmental performance and periodic submission of monitoring reports o The Contractor shall consult with local residents and local government before locating project offices, sheds, and construction plant. The work camps shall not be located near settlements, near drinking water supply intakes, protected areas, or wildlife habitats. o The Contractor shall maintain all borrow sites, stockpiles, and spoil disposal areas so as to assure the stability and safety of the works and that any adjacent feature is not endangered, and to assure free and efficient natural and artificial drainage, and to prevent erosion o Muck shall be disposed of at approved disposal sites prepared, filled, and restored in accordance with the related specification requirements o All precautionary measures shall be taken to prevent the wastewater that is generated during construction from entering into streams, water bodies or the irrigation channels o Permission for the extraction of water should be obtained prior to the commencement of the project, from the relevant authority o Hazardous waste must be handled as per hazardous waste management rule 2016 o Construction material such as sand, aggregates and other quarry material should only be sourced from licensed quarries as per consent from PWD o Storage of Oil and chemicals that are to be used during construction work shall be stored at a designated confined place on a impervious layer so no leakage could occur such that contamination of water bodies and soil is prevented
2	Transportation of material	• All materials should be transported in fully covered trucks. • Overloading of vehicles with materials should be controlled • Vehicles should comply with the relevant local legislation

3	Occupational Health and Safety during construction	The Contractor shall, in accordance with the safety and health provisions specified in the EMF or site specific EMP, provide workers with a safe and healthy working environment, in the work areas. In this regards the contractor shall: ○ provide appropriate equipment to minimize risks and requiring and enforcing its use ○ train workers to comply with health and safety procedures and use protective equipment; ○ establish a system to document and report occupational accidents, diseases, and incidents; ○ establish an emergency prevention, preparedness, and response arrangements in place
		○ The contractor should arrange adequate supply of water throughout the construction period. ○ Provision of temporary toilet facilities for worker; contractors can identify suitable locations in close proximity to construction site.

A.8. List of Recommended Pesticides

Sl. No	Name of pesticides	Main use	Effective against	Class as per WHO
1.	Iprodione	F	Fungal pathogens	Class III[79]
2.	Penconazole	F	Fungal pathogens	Class III
3.	Malathion, Dust/EC	I	Insect pests	Class III
4.	Hexaconazole	F	Fungal pathogens	Class III
5.	Chloropyriphos	I	Insect pests	Class III
6.	Spinosad	I	Insect pests	Class III
7.	Propergite	I	Insect pests	Class III
8.	Captan	F	Fungal pathogens	Class IV[80]
9.	Mancozeb	F	Fungal pathogens	Class IV
10.	Propineb	F	Fungal pathogens	Class IV
11.	Thiophanate-methyl	F	Fungal pathogens	Class IV
12.	Carbendazim	F	Fungal pathogens	Class IV
13.	Benomyl	F	Fungal pathogens	Class IV
14.	Cholorthalonil	F	Fungal pathogens	Class IV
15.	Dimethomorph	F	Fungal pathogens	Class IV

Source: WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2009
Note: F - Fungicide, I – Insecticide

A.9. List of Banned Pesticides

Sl. No	Name of pesticides	Main use	Effective against
1	Phorate	I	Insect pests
2	Phosphamidon	I	Insect pests
3	Carbofuran	I	Insect pests
4	Dichlorvos	I	Insect pests
5.	Edifenphos	I	Insect pests
6.	Monocrotophos	I	Insect pests
7	Triazophos	I	Insect pests
8	Zinc phosphide	I	Insect pests
9	Carbaryl	I	Insect pests
10	Carbosulfan	I	Insect pests
11	Copper oxychloride	F	Fungal pathogens
12	Cymoxanil	F	Fungal pathogens
13	Cypermethrin	I	Insect pests
14	Deltamethrin	I	Insect pests
15	Fipronil	I	Insect pests
16	Imidacloprid	I	Insect pests
17	Metalaxyl	F	Fungal pathogens
18	Profenophos	I	Insect pests
19	Propiconazole	F	Fungal pathogens
20	Quinalphos	I	Insect pests
21	Tebuconazole	F	Fungal pathogens
22	Tridemorph	F	Fungal pathogens

Source: WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2009
Note: F - Fungicide, I – Insecticide

A.10. Class II (Moderate Hazard) technical grade active ingredients in the pesticide (Source: WHO)

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Acephate [ISO]	30560-19-1		OP	S	I	4	945	JMPR 1991, 2003b, *2006b; ICSC 748*
Acifluorfen [ISO]	50594-66-6			S	H	4	1370	Strong irritant to eyes
Alachlor [ISO]	15972-60-8	2588		S	H	4	930	See note 1; DS 86; IARC 19, 36, 63; ICSC 371
Alanycarb [ISO]	83130-01-2		C	S	I	4	330	
Allethrin [ISO]	584-79-2		PY	Oil	I	4	c685	See note 9, page 8; EHC 87; HSG 24; ICSC 212; JMPR 1965a
Ametryn [ISO]	834-12-8		T	S	H	4	110	
Amitraz [ISO]	33089-61-1			S	AC	4	800	ICSC 98; JMPR 1999
Anilofos [ISO]	64249-01-0		OP	S	H	4	472	
Azaconazole	60207-31-0			S	F	4	308	
Azamethiphos [ISO]	35575-96-3		OP	S	I	4	1010	
Azocyclotin [ISO]	41083-11-8	2786	OT	S	AC	3	80	JMPR 1990, 1995b, *2006b*
Bendiocarb [ISO]	22781-23-3	2757	C	S	I	3	55	DS 52
Benfuracarb [ISO]	82560-54-1	2992	C	L	I	3	205	
Bensulide [ISO]	741-58-2	2902		L	H	3	270	ICSC 383
Bensultap [ISO]	17606-31-4			S	I	4	1100	
Bentazone [ISO]	25057-89-0			S	H	4	1100	HSG 48; ICSC 828; JMPR 1999, 2005
Bifenthrin	82657-04-3	3349	PY	S	I	3	c55	JMPR 1993
Bilanafos [ISO]	71048-99-2			S	H	3	268	
Bioallethrin [C]	584-79-2		PY	L	I	4	c700	See note 2; note 9, p. 8; ICSC 227
Bromoxynil [ISO]	1689-84-5	2588		S	H	3	190	
Bromuconazole	116255-48-2			S	F	4	365	ICSC 1264
Bronopol	52-51-7			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	

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Butroxydim [ISO]	138164-12-2			S	H	4	1635	
Butylamine [ISO]	13952-84-6	1992		L	F	4	380	Irritant to skin; ICSC 401; JMPR 1982, 1985b
Carbaryl [ISO]	63-25-2	2757	C	S	I	3	c300	DS 3; EHC 153; HSG 78; IARC 12, Suppl.7; ICSC 121; JMPR 1997b, 2002
Carbosulfan [ISO]	55285-14-8	2992	C	L	I	3	250	JMPR 1987a, 2004
Cartap [ISO]	15263-53-3			S	I	4	325	EHC 76; JMPR 1996a
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; DS 36; EHC 34; HSG 13; IARC 79; ICSC 740; JMPR 1995a
Chlorfenapyr [ISO]	122453-73-0			S	I,MT	4	441	
Chlormequat (chloride) [ISO]	999-81-5			S	PGR	4	670	ICSC 781; JMPR 2000
Chloroacetic acid [C]	79-11-8	1751		S	H	4	650	Irritant to skin and eyes; data refer to sodium salt; ICSC 235
Chlorphonium chloride [ISO]	115-78-6	2588		S	PGR	3	178	Irritant to skin and eyes
Chlorpyrifos [ISO]	2921-88-2	2783	OP	S	I	3	135	DS 18; ICSC 851; JMPR 2000
Clomazone [ISO]	81777-89-1			L	H	4	1369	
Copper hydroxide [C]	20427-59-2		CU	S	F	4	1000	
Copper oxychloride [C]	1332-40-7		CU	S	F	4	1440	
Copper sulfate [C]	7758-98-7		CU	S	F	3	300	*ICSC 751*
4-CPA [ISO]	122-88-3		PAA	S	PGR	4	850	
Cuprous oxide [C]	1317-39-1		CU	S	F	4	470	ICSC 421, EHC 200
Cyanazine [ISO]	21725-46-2		T	S	H	3	288	ICSC 391
Cyanophos [ISO]	2636-26-2		OP	L	I	4	610	
Cyhalothrin [ISO]	68085-85-8	3352	PY	Oil	Ix	3	c144	See note 9, p. 8; EHC 99; HSG 38; ICSC 858; JMPR 1985c; JECFA 2000b
Cyhexatin [ISO]	13121-70-5		OT	S	AC	3	*265*	EHC 15; JMPR 1995b, *2006b*
Cymoxanil [ISO]	57966-95-7			S	F	4	1196	

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Cypermethrin [ISO]	52315-07-8	3352	PY	L	I	3	c250	See note 9, p. 8; DS 58; EHC 82; HSG 22; ICSC 246; JECFA 1996
Alpha-cypermethrin [ISO]	67375-30-8	3349	PY	S	I	3	c79	See note 9, p 8; EHC 142; JECFA 1996; *JMPR 2008*
Cyphenothrin [(1R)-isomers] [ISO]	39515-40-7	3352	PY	L	I	4	318	
Cyproconazole	94361-06-5			S	F	4	1020	
2,4-D [ISO]	94-75-7	3345	PAA	S	H	4	375	DS 37; EHC 29, 84; HSG 5; IARC 41, Suppl. 7; ICSC 33; JMPR 1998b
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; DS 21; EHC 9, 83; IARC 53; ICSC 34; JMPR 1985c, 2001
Deltamethrin [ISO]	52918-63-5	3349	PY	S	I	3	c135	See note 9, p. 8; DS 50; EHC 97; HSG 30; IARC 53; ICSC 247; JMPR 2001
Diazinon [ISO]	333-41-5	3018	OP	L	I	4	*300*	DS 45, EHC 198; ICSC 137; JMPR 1994, 2002, *2008*
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]	7547-66-2			S	H	4	800	ICSC 38
Diclofop [ISO]	40483-25-2			S	H	4	565	
Dicofol [ISO]	115-32-2		OC	S	AC	4	c690	DS 81; IARC 30; ICSC 752; JMPR 1993
Difenoconazole [ISO]	119446-68-3			S	F	4	1453	*JMPR 2009b*
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 2000, 2005

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Dimethenamid [ISO]	*87674-68-8*			*L*	*H*	*4*	*371*	*LD_{50} of P isomer is 429 mg/kg bw; JMPR 2006b*
Dimethylarsinic acid [C]	75-60-5	1572	AS	S	H	4	1350	
Dimethoate [ISO]	60-51-5	2783	OP	S	I	3	c150	DS 42; EHC 90; HSG 20; ICSC 741; JMPR 1997b, 2004
Diniconazole [ISO]	83657-24-3			S	F	4	639	
Dinobuton [ISO]	973-21-7	2779	NP	S	AC,F	3	140	
Dinocap [ISO]	39300-45-3		NP	S	AC,F	4	980	ICSC 881; JMPR 1999
Diphenamid [ISO]	957-51-7			S	H	4	970	ICSC 763
Diquat [ISO]	2764-72-9	2781	BP	S	H	3	231	Irritant to skin and eyes and damages nails; DS 40; EHC 39; HSG 52; JMPR 1994; *ICSC 1363*
Dithianon [ISO]	3347-22-6			S	F	4	640	JMPR 1993
Dodine [ISO]	2439-10-3			S	F	4	1000	JMPR 2001
Endosulfan [ISO]	115-29-7	2761	OC	S	I	3	80	DS 15; EHC 40; HSG 17; ICSC 742; JMPR 1999
Endothal-sodium [(ISO)]	125-67-9	2588		S	H	3	51	
EPTC [ISO]	759-94-4		TC	L	H	4	1652	ICSC 469
Esfenvalerate [ISO]	66230-04-4	3349	PY	S	I	3	87	JMPR 2003b; *ICSC 1516*
Ethion [ISO]	563-12-2	3018	OP	L	I	3	208	ICSC 888; JMPR 1991
Fenazaquin [ISO]	120928-09-8	2588		S	AC	3	134	
Fenitrothion [ISO]	122-14-5		OP	L	I	4	503	DS 30; EHC 133; HSG 65; ICSC 622; JMPR 2001
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]	64257-84-7	3349	PY	S	I	3	c66	See note 9, p. 8; JMPR 1994
Fenpyroximate [ISO]	*134098-61-6*			*S*	*AC*	*3*	*245*	*Highly toxic by inhalation (LC_{50} = 0.21-0.36 mg/l); JMPR 2007*
Fenthion [ISO]	55-38-9	3018	OP	L	I,L	3	D586	DS 23; ICSC 655; JMPR 1998b
Fentin acetate[(ISO)]	900-95-8	2786	OT	S	F	3	125	DS 22; EHC 15; JMPR 1992; CICAD 13

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Fentin hydroxide[(ISO)]	76-87-9	2786	OT	S	F	3	108	DS 22; EHC 15; ICSC 1283; JMPR 1992; *CICAD 13*
Fenvalerate [ISO]	51630-58-1	3352	PY	L	I	4	c450	See note 9, p. 8; DS 90; EHC 95, HSG 34; IARC 53; ICSC 273; JMPR 1986c
Ferimzone [ISO]	89269-64-7			S	F	4	725	
Fipronil	120068-37-3	2588		S	I	3	92	JMPR 1998b, 2001; *ICSC 1503*
Fluchloralin [ISO]	33245-39-5			S	H	4	1550	
Flufenacet [ISO]	142459-58-3			S	H	4	600	May cause skin sensitization
Fluoroglycofen	77501-60-1			S	H	4	1550	
Flurprimidol [ISO]	56425-91-3			S	PGR	4	709	
Flusilazole	85509-19-9			S	F	4	*672*	JMPR 1996b, *2009b*
Flutriafol [ISO]	76674-21-0			S	F,FST	4	1140	
Fluxofenim [ISO]	88485-37-4			oil	H	4	670	
Fomesafen [ISO]	72178-02-0		OC	S	H	4	1250	
Fuberidazole [ISO]	3878-19-1			S	F	4	336	
Furalaxyl [ISO]	57646-30-7			S	F	4	940	
Gamma-HCH [ISO], Lindane	58-89-9	2761	OC	S	I	3	88	*ICSC 53*; JMPR 2003b; See note 3
Glufosinate [ISO]	53369-07-6			S	H	4	1625	JMPR 2000
Guazatine	108173-90-6			S	FST	3	230	LD_{50} value refers to triacetate; JMPR 1998b
Haloxyfop	69806-34-4			S	H	4	*300*	JMPR 1996b, *2008 (includes Haloxyfop-R and esters)*
HCH [ISO]	608-73-1	2761	OC	S	I	3	100	See notes 3, 4 and 5; EHC 123; IARC 5, 20, 42; ICSC 487; JMPR 1974
Hexazinone [ISO]	51235-04-2			S	H	4	1690	
Hydramethylnon	67485-29-4			S	I	4	1200	
Imazalil [ISO]	35554-44-0	2588		S	F	3	*227*	ICSC 1303; JMPR 2001, 2002, *2006b*
Imidacloprid [ISO]	138261-41-3			S	I	4	450	JMPR 2002; *ICSC 1501*

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Iminoctadine [ISO]	13516-27-3			S	F	3	300	Eye irritant
Indoxacarb [ISO]	*173584-44-6*			*S*	*I*	*3*	*268*	*JMPR 2006b; LD_{50} applies to 3:1 mixture of isomers in commercial use*
Ioxynil [ISO]	1689-83-4	2588		S	H	3	110	ICSC 900
Ioxynil octanoate [(ISO)]	3861-47-0			S	H	4	390	
Iprobenfos	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	1190	
Isoproturon [ISO]	34123-59-6			S	H	4	1800	
Isouron [ISO]	55861-78-4			S	H	4	630	
Lambda-cyhalothrin	2164-08-1	3349	PY	S	I	3	c56	See note 9, p. 8; EHC 142; HSG 38; *JMPR 2009b; ICSC 859*
MCPA [ISO]	94-74-6		PAA	S	H	4	700	IARC 30, 41; 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 1983, 2003b
Metaldehyde [ISO]	108-62-3			S	M	3	227	DS 93
Metamitron [ISO]	41394-05-2			S	H	4	1183	*ICSC 1361*
Metam-sodium [(ISO)]	137-42-8	2771		S	F-S	3	285	
Metconazole [ISO]	125116-23-6			S	F	4	660	
Methacrifos [ISO]	62610-77-9		OP	L	I	4	678	JMPR 1991

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD$_{50}$ mg/kg	Remarks
Methasulfocarb [ISO]	66952-49-6	2757		S	F	3	112	
Methylarsonic acid [ISO]	124-58-3		AS	S	H	4	1800	ICSC 755; EHC 224
Methyl isothiocyanate [ISO]	556-61-6	2588		S	F-S	3	72	Skin and eye irritant; see note 6
Metolcarb [ISO]	1129-41-5		C	S	I	3	268	
Metribuzin [ISO]	21087-64-9			S	H	4	322	*ICSC 516*
Molinate [ISO]	2212-67-1		TC	L	H	4	720	
Myclobutanil	88671-89-0			S	F	4	1600	JMPR 1993
Nabam [ISO]	142-59-6	2771		S	F	4	395	Goitrogenic in rats
Naled [ISO]	300-76-5	3018	OP	L	I	4	430	DS 39; ICSC 925
2-Napthyloxyacetic acid [ISO]	120-23-0			S	PGR	4	600	
Nitrapyrin [ISO]	1929-82-4			S	B-S	4	1072	*ICSC 1658*
Nuarimol [ISO]	63284-71-9			S	F	4	1250	
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 1989
Paraquat [ISO]	1910-42-5	2781	BP	S	H	3	150	See note 7; DS 4; EHC 39; HSG 51; ICSC 5; JMPR 1987a, 2004
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	4	c500	See note 9, p. 8; DS 51; EHC 94; HSG 33; IARC 53; ICSC 312; JMPR 2000
Phenthoate [ISO]	2597-03-7	3018	OP	L	I	4	c400	DS 48; JMPR 1985c
Phosalone [ISO]	2310-17-0	2783	OP	S	I	3	120	ICSC 797; JMPR 1998b, 2002
Phosmet [ISO]	732-11-6	2783	OP	S	I,AC	3	113	ICSC 543; JMPR 1999, 2004
Phoxim [ISO]	14816-18-3		OP	L	I	4	D1975	DS 31; JECFA 2000a
Piperophos [ISO]	24151-93-7	3018	OP	oil	H	4	324	

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Pirimicarb [ISO]	23103-98-2	2757	C	S	AP	3	147	JMPR 1983, 2005
Pirimiphos-methyl [ISO]	29232-93-7		OP	L	I	4	*1667*	DS 49; JMPR 1993, *2008*
Prallethrin [ISO]	23031-36-9	3352	PY	oil	I	4	460	
Prochloraz [ISO]	67747-09-5			S	F	4	1600	JMPR 1985a
Profenofos [ISO]	41198-08-7	3018	OP	L	I	4	358	JMPR 1991, 2008
Propachlor [ISO]	1918-16-7			S	H	4	1500	DS 78; EHC 147; HSG 77; JMPR 2002
Propanil [ISO]	709-98-8			S	H	4	c1400	ICSC 552
Propiconazole [ISO]	60207-90-1			L	F	4	1520	JMPR 1988, 2005
Propoxur [ISO]	114-26-1	2757	C	S	I	3	95	DS 25; ICSC 191; JMPR 1990
Prosulfocarb [ISO]	52888-80-9		TC	L	H	4	1820	
Prothiofos [ISO]	34643-46-4		OP	L	I	4	925	
Pyraclofos [ISO]	77458-01-6	3018	OP	L	I	3	237	
Pyrazophos [ISO]	13457-18-6	2784		S	F	4	435	JMPR 1993
Pyrazoxyfen [ISO]	71561-11-0			S	H	4	1644	
Pyrethrins [C]	8003-34-7			L	I	4	500-1000	See note 8; DS 11; JMPR 2000, 2004; *ICSC 1475*
Pyridaben [ISO]	96489-71-3			S	AC	4	820	
Pyridaphenthion	119-12-0		OP	S	I	4	769	
Pyroquilon [ISO]	57369-32-1			S	F	4	320	
Quinalphos [ISO]	13593-03-8	2783	OP	S	I	3	62	
Quinoclamine [ISO]	2797-51-5			S	H	4	1360	
Quizalofop	76578-12-6			S	H	4	1670	
Quizalofop-p-tefuryl [ISO]	119738-06-6			L	H	4	1012	
Rotenone [C]	83-79-4	2588		S	I	3	132-1500	See note 9; HSG 73; ICSC 944
Simetryn [ISO]	1014-70-6		T	S	H	4	1830	
Sodium chlorate [ISO]	7775-09-9	1495		S	H	4	1200	ICSC 1117

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Spiroxamine [ISO]	118134-30-8			L	F	4	500	Dermal LD_{50} 1068 mg/kg; may cause skin sensitisation
Sulfluramid [ISO]	4151-50-2			S	I	4	543	
2,3,6-TBA [ISO]	50-31-7			S	H	4	1500	
TCA [ISO] (acid)	76-03-9	1839		S		4	400	See note 5 to Table 4, p. 38; ICSC 586
Tebuconazole [ISO]	107534-96-3			S	F	4	1700	JMPR 1995b
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 2008*
Thiobencarb [ISO]	28249-77-6		TC	L	H	4	1300	
Thiocyclam [ISO]	31895-22-4			S	I	4	310	
Thiodicarb [ISO]	59669-26-0	2757	C	S	I	3	66	JMPR 2001
Thiram [ISO]	137-26-8			S	F	4	560	DS 71; EHC 78; IARC 12, 53; ICSC 757; JMPR 1993; See note 3
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 1986b, 2005
Triadimenol [ISO]	55219-65-3			S	FST	4	900	JMPR 1990, 2005
Triazamate [ISO]	112143-82-5	2588		S	AP	3	50-100	
Trichlorfon [ISO]	52-68-6		OP	S	I	3	250	DS 27; EHC 132; HSG 66; IARC 30, Suppl 7; ICSC 585; JMPR 1979; JECFA 2000b, 2003
Triclopyr [ISO]	55335-06-3			S	H	4	710	
Tricyclazole [ISO]	41814-78-2			S	F	4	305	
Tridemorph [ISO]	81412-43-3			Oil	F	4	650	
Triflumizole	99387-89-0			S	F	4	695	ICSC 1252

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Uniconazole [ISO]	83657-22-1			S	PGR	4	1790	
XMC	2655-14-3		C	S	I	4	542	
Xylylcarb	2425-10-7		C	S	I	4	380	
Ziram [ISO]	137-30-4			S	F	4	1400	Irritant to skin; DS 73; EHC 78; IARC 12, 53; ICSC 348; JMPR 1997b

EHC = Environmental Health Criteria Monograph; DS= Pesticide Data Sheet; HSG = Health and Safety Guide; IARC = IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; ICSC = International Chemical Safety Card; JECFA = Evaluation by the Joint FAO/WHO Expert Committee on Food Additives; JMPR = Evaluation by the Joint FAO/WHO Meeting on Pesticide Residues.

Notes to Class II

1. Alachlor was previously classified as a Class Ia pesticide due to its carcinogenicity in rats. However mechanistic studies have indicated that tumors are induced by a mechanism not relevant to humans.
2. Bioallethrin, esbiothrin, esbiol, and esdepalléthrine are members of a series; their toxicity varies considerably within this series, according to concentrations of isomers.
3. The international trade of chlordane, DDT, Gamma-HCH (lindane), HCH, mercury compounds and thiram is regulated by the Rotterdam convention on Prior Informed Consent (see http://www.pic.int/), which entered into force on 24 February 2004. See Table 7, p. 51.
4. The production and use of chlordane, DDT, *Gamma-HCH (lindane) and HCH (specifically alpha-HCH and beta-HCH)* are strictly limited by the Stockholm convention on persistent organic pollutants, which entered into force on 17 May, 2004 *and has subsequently been amended*. See http://www.pops.int/.
5. HCH: The LD_{50} varies according to the mixture of isomers. The value shown has been chosen, and the technical product placed in Class II, as a result of the cumulative properties of the beta isomer.
6. The melting point of methyl isothiocyanate (S) is 35°C.
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.
8. Mixture of compounds present in *Pyrethrum cineraefolium* and other flowers.
9. Compounds from roots of *Derris* and *Lonchocarpus* spp.

A.11. Images from National level stakeholder consultation organized by the Ministry of Food Processing Industries