FEASIBILITY REPORT

ON

ESTABLISHMENT OF LOW COST MODERN ABATTOIR FOR RURAL/SEMI URBAN AREAS

FOR

MINISTRY OF FOOD PROCESSING INDUSTRIES

PREPARED BY

G.K.SEN AND ASSOCIATES

G. K. SEN
AND
ASSOCIATES

KOLKATA

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CHAPTER-1
Introduction

Based on the advice of MOFPI, this Techno-Economic Feasibility Report is prepared for establishment of low cost Modern Abattoir for rural/semi urban areas so that the same can run on sustainable way independently after its implementation through MOFPI grant by Local Bodies.

The objective of implementation of such service abattoirs by local bodies through GOI initiative are as follows:-

1. To stop illegal slaughtering and thereby to reduce pollution & environmental hazards in the locality.

2. To provide hygienically prepared wholesome meat to local population to reduce health hazards

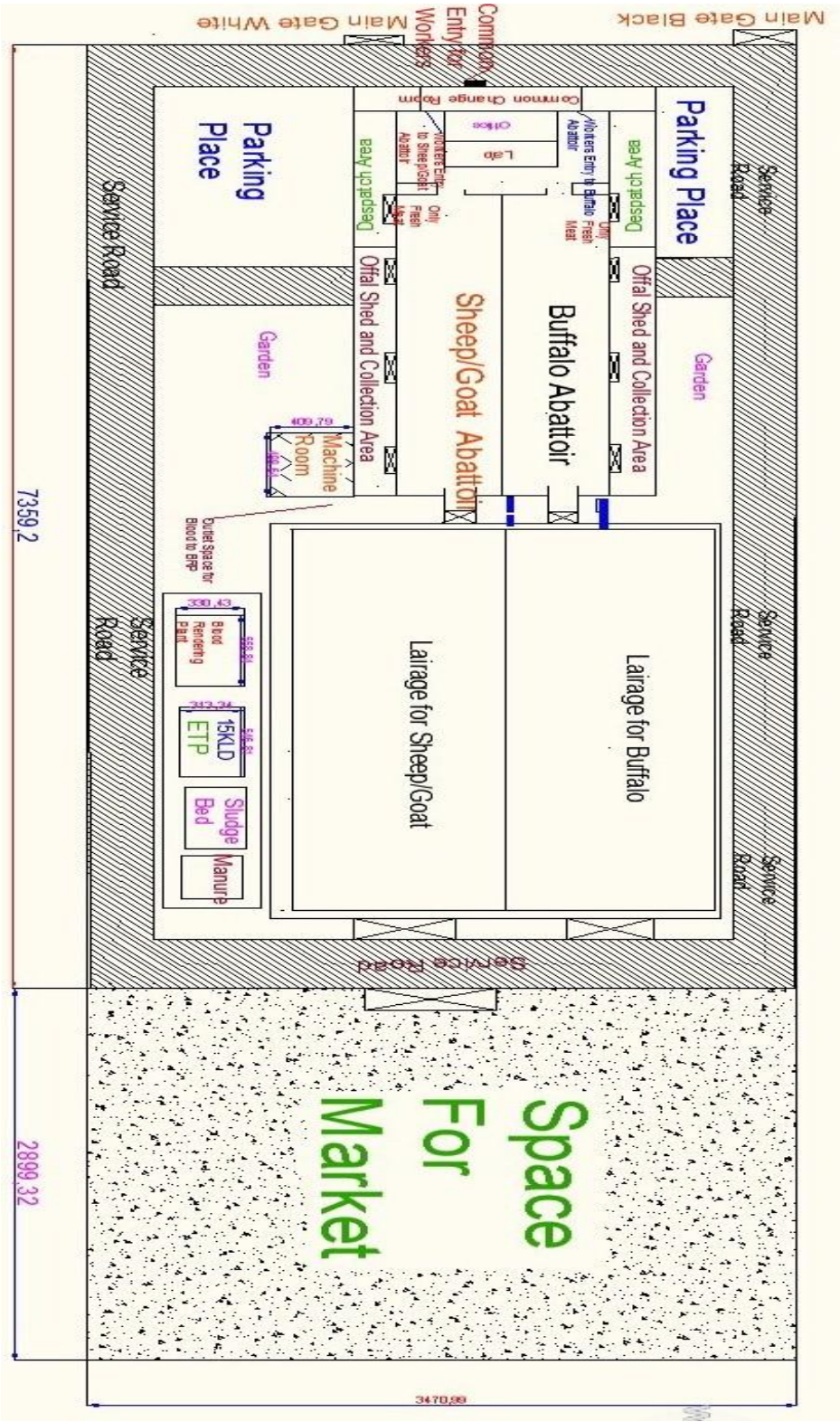
3. To benefit the animal farmers to receive remunerative prices for their farm produce at the proposed animal market /animal mandi adjacent to the proposed service abattoir where buying by the local meat sellers and selling by the farmers will take place at one point resulting reduction/elimination of middlemen in the trade.

4. The PIA/Local Bodies shall be benefitted due to more revenue earnings by way of collection of slaughter fees, selling of Blood meal & Manure.

A model of such abattoir as considered in the report is having the following features:-

- It is a service abattoir where animals are to be brought by the local meat sellers for slaughtering and shall take away everything including offal leaving behind only Dung, Ingesta & Blood

- Slaughter capacity as per Halal method: - Min. 50 large animals & Min. 100 small animals per day of 8hours operations.
- Reasonable hygiene & sanitary conditions are considered for wholesome meat production without contamination.
- Manual mode of operation is considered to keep electrical load requirement as low as possible so that Plant running expenses are minimal.
- A small DG Set of 35 KVA is considered as stand –by power arrangement.
- Normal LT Power from State Electricity Boards is considered for around 50 KW power requirements in the plant.
- No Chiller is considered.
- Suitable Effluent Treatment Plant (ETP) of capacity 15 KLD is considered along with Blood Processing System to handle 1 KLD Blood.
- Conventional Civil Building is considered for Abattoir construction with adequate Lairage, Water Distribution System, required Ventilation & Exhaust, Drainage, Veterinary Inspection Facilities, Lab, Utilities, Workers Entry / Exit Block followed by internal Road, Storm Water Drainage as per requirement.
- Typical Plant Layout is provided which is having land requirement min 102 mtr X 35 mtr which includes Animal market



Legends	
Buffalo Abattior	30 mtr * 5 mtr
Sheep Abattior	30 mtr * 5 mtr
Buffalo lairage	29.67 mtr * 10 mtr
Sheep Lairage	29.67 mtr * 10.5 mtr
Space for Market	29 mtr * 34.70 mtr
Service Road	Running road 230 mtr * 3 mtr Width
Machine Room	5 mtr * 4 mtr
Blood Rendering Plant	5.5 mtr * 3.3 mtr
ETP	5.5 mtr * 3 mtr
Common Change Room	7.5 mtr * 2 mtr
Shed for offal(sheep)	30 mtr * 2 mtr
Shed for offal(Buffalo)	30 mtr * 2 mtr

CHAPTER-2

Plant Description

The proposed project is subdivided into 4 major sections. These are as follows:-

- Sheep/Goat abattoir of capacity min 100 heads per day of 8hours operation
- Buffalo abattoir of capacity min 50 heads per day of 8hours operation
- Custom built Effluent treatment plant of capacity 15KLD
- Blood processing plant of capacity 1KLD

The product will be Meat carcasses that is Bone in Meat and by product will be Blood Meal and Manure. The process of producing finished product from live animals takes place in series of operations. Generally the steps are defined as follows:-

Step 1 : Receiving & Anti-mortem inspection of animals in open Lairage.

Step 2 : Checked & passed animals are put to Covered Lairage / Holding Pen.

Step 3 : Forwarding the animals to Abattoir through Raceway.

Step 4 : Abattoir where Slaughtering & Dressing of animals are carried out.

Step 5 : Removal of Hoof, Horn, De-hiding, De-skinning and removal of Head are carried out.

Step 6 : Splitting of Animal's abdomen to remove various organs / Viscera / Offal.

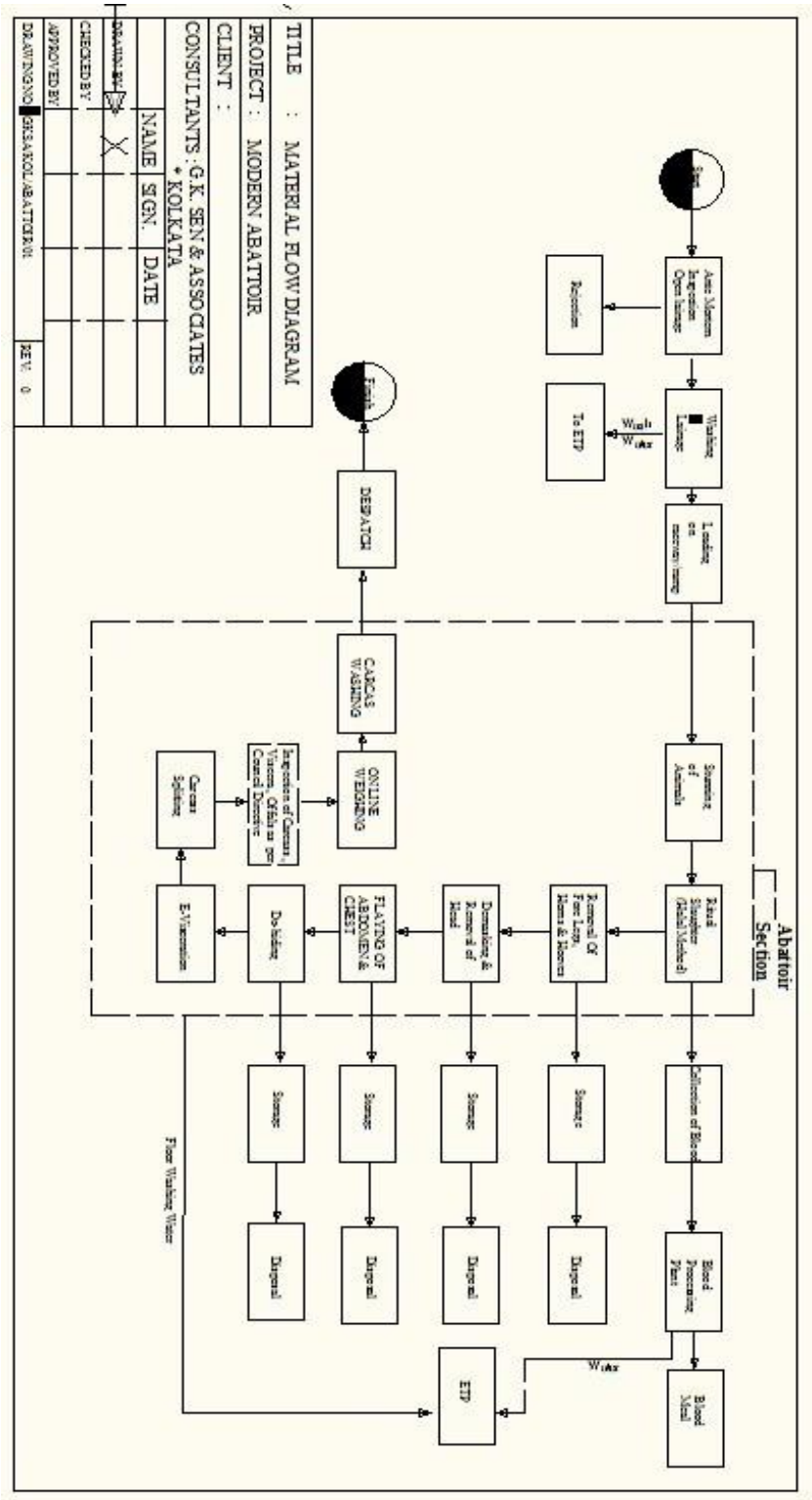
Step 7 : Post Mortem inspection followed by washing of Carcass before dispatch.

SLAUGHTERING PROCESS:

An Abattoir is a building where a well defined systematically planned sequential operation is carried out scientifically to produce hygienic wholesome meat from an animal for human consumption. The humane slaughtering process is carried out by knowledgeable and skilful operators based on Halal method with modern technique.

Meat for human consumption must come not only from disease free animal but also to adapt scientific techniques during process of operations so that meat should be produced hygienically. All the operations should be carried out in clean and sanitized place.

A typical flow chart of Slaughter Operation is enclosed.



BLOOD PROCESSING SYSTEM

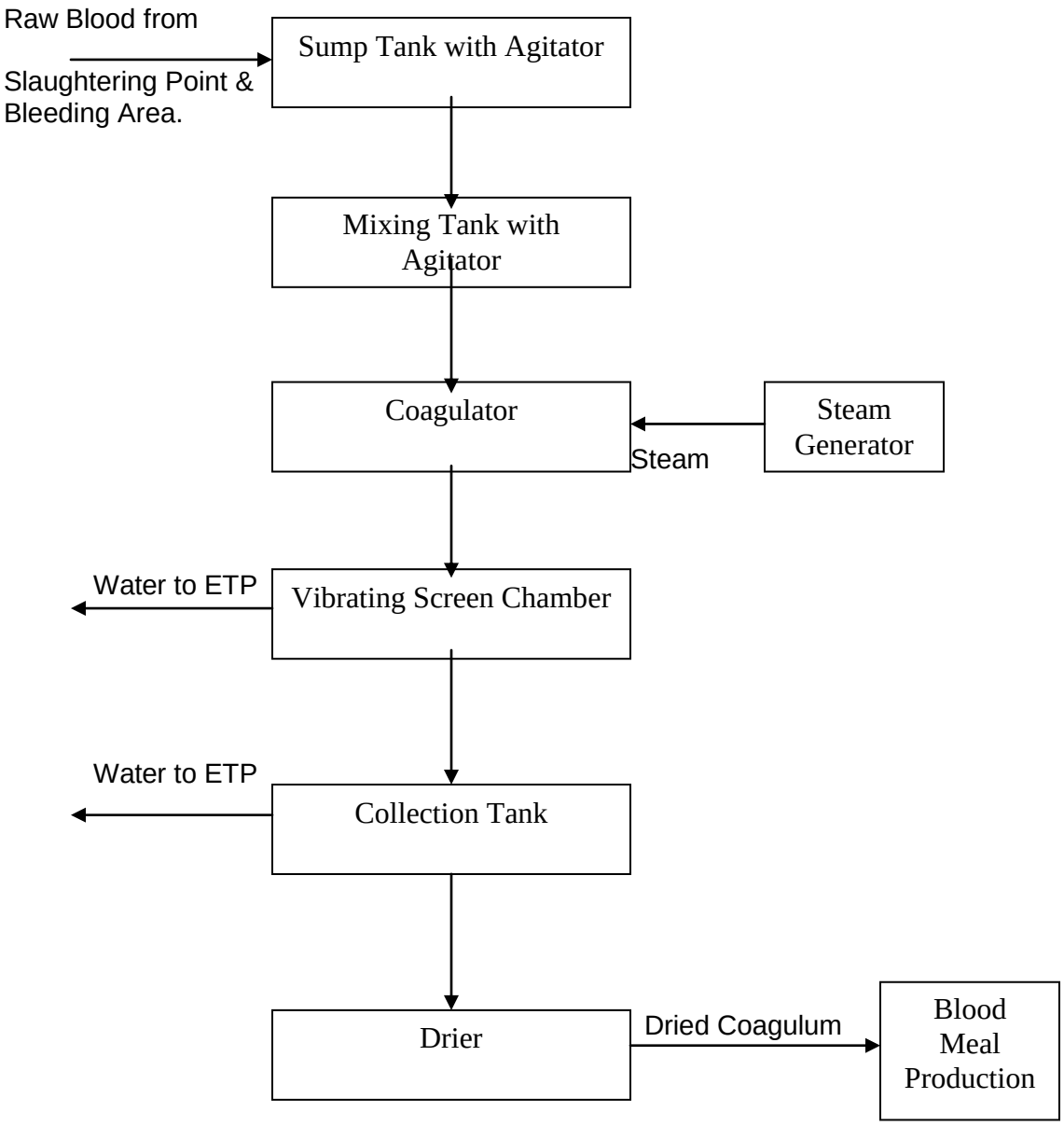
Animal blood will be separately collected from the slaughter point and bleeding area to ensure major blood separation for feeding to proposed Blood Processing Plant of capacity 1,000 Ltr per day.

The major blood from Halal point and bleeding area of the slaughter house to be stored in a sump tank. There will be a mixing devise in the tank to keep the blood homogeneous. The above raw blood is to be transferred for processing.

The above blood will be transferred through pump from blood collection tank/sump tank to a coagulator fitted with agitators where steam through a Steam Generator will be injected for cooking the blood.
The coagulator will cook the blood when coagulum will be formed and the coagulum will then be taken to a vibrating screen chamber. The water from the vibrating screen chamber will be discharged to ETP which will be having around 500mg/Ltr. BOD concentration. The coagulum / cooked blood cells from the vibrating screen will then be discharged to a Drier for producing Blood Meal. The product Blood Meal is very rich in protein and used mainly for Fish Meal Production and Poultry Feed production.

A typical flow diagram of Blood Processing Plant is enclosed:

Flow Diagram for Blood Processing:



EFFLUENT TREATMENT PLANT:

The floor washing water from Lairages, Slaughter Halls and Blood Processing Plant are to be treated in a custom built Effluent Treatment Plant. It is envisaged that around max 15 KLD effluent water will be available for treatment in the proposed ETP.

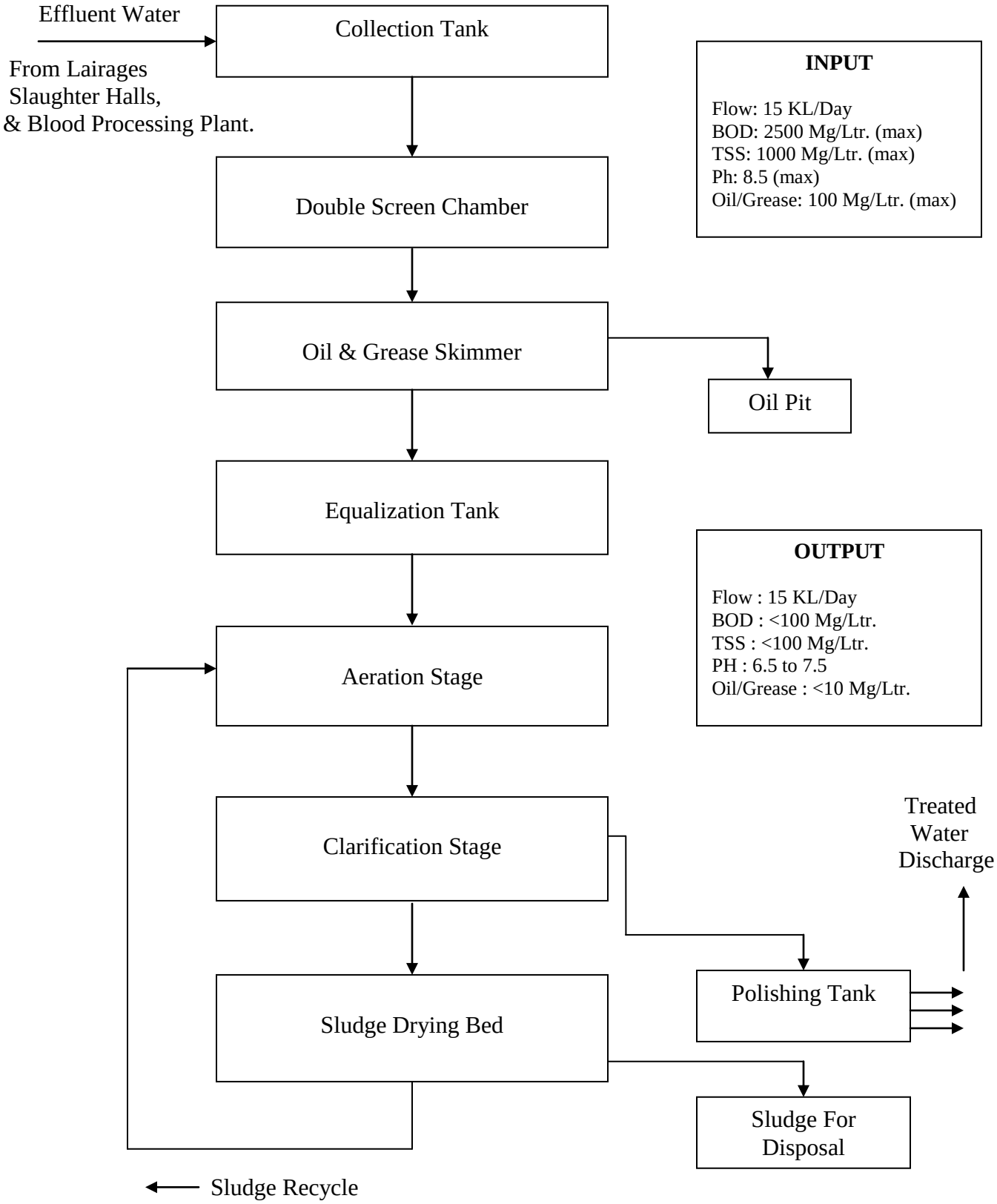
Treatment Concept:

The treatment should be decided keeping in mind the raw Effluent quality and desired discharge quality. It is envisaged to set up an ETP of adequate capacity of minimum 15 KLD for treatment of raw influent.

The BOD of raw influent is envisaged around 2500 mg/liter. The desired treated effluent BOD should be less than 100 mg/Liter or as per the norms and standards of respective State Pollution Control Board. Biological method of treatment of the influent is envisaged to be adopted providing adequate aeration and clarification.

The treated effluent from the proposed ETP should conform to the standards laid down by respective State Pollution Control Board and to be used for Lairage washing, gardening purposes and for inland surface drains.

A typical Flow Diagram of ETP is given below:


Effluent Water
From Lairages
Slaughter Halls,
& Blood Processing Plant.
Collection Tank
Double Screen Chamber
Oil & Grease Skimmer
Oil Pit
Equalization Tank
Aeration Stage
Clarification Stage
Sludge Drying Bed
Polishing Tank
Treated
Water
Discharge
Sludge For
Disposal
Sludge Recycle
INPUT
Flow: 15 KL/Day
BOD: 2500 Mg/Ltr. (max)
TSS: 1000 Mg/Ltr. (max)
Ph: 8.5 (max)
Oil/Grease: 100 Mg/Ltr. (max)
OUTPUT
Flow : 15 KL/Day
BOD : <100 Mg/Ltr.
TSS : <100 Mg/Ltr.
PH : 6.5 to 7.5
Oil/Grease : <10 Mg/Ltr.

BIO-COMPOSTING:

In any Service Abattoir it is noticed that animal owners take away each and every Body Parts including edible and non-edible offal along with the main product meat carcasses after slaughtering leaving behind only dung and ingesta (undigested paunch contents). An area has been earmarked in the enclosed typical Plant Layout Drawing where the above left-over dung and ingesta may be composted for producing saleable Bio-Fertilizer by-product. The above process is a manual mode operation where no electricity for process is required.

CHAPTER-3
Brief Specification of Proposed Slaughter House Equipments.

Sheep/Goat Slaughter House:

1. **Killing Box**

   Stunning Box shall be tipping type stunning box to hold sheep/goat still for stunning tongs. The box shall be of adequate size and fabricated from suitable steel tubular structures properly galvanized. The tilting shall be manual and with proper counter weight / spring arrangement. A 2 mm thick stainless steel trough of matching size and sloping properly for blood collection shall be included.

2. **Bleeding Platform**

   Bleeding Platform shall be made of 3mm SS plate approximately 1 meter long which will fix into the floor level. There will be pipe line connection up to outside the building for collection of blood.

3. **Elevator**

   Elevator shall be made of MS for lifting sheep/ goat from killing area on to the bleeding rail.

4. **Fixed Dressing platform with knife sterilizer & hand wash basin**

   Fixed dressing platform shall be made of adequate size and fabricated from suitable MS Steel tubular structures properly galvanized and will be used to perform various dressing operations on dressing rail.

5. **Dressing rail**

   Dressing rail, Galvanized iron pipe, with manual stoppage shall be made of GI pipe and MS plate properly galvanized and will be used to transfer whole animal for de-skinning and other dressing operations.

6. **Trolley**

   Trolley (Galvanized wheel type) shall be fabricated and mounded on M.S pipe with swiveling castor. They shall have a handle.

7. Hand Wash Basin

Hand Wash Basin shall be complete with hot water and cold water connections and valves. The base frame shall be fabricated and properly galvanized (SS-304 make). Proper drainage will be provided.

8. Dressing Hooks

Dressing Hooks of SS-304 make for hanging and moving carcass on to the dispatch rail.

11. Electrical Control Panel

As per the requirement of the slaughterhouse will be designed and installed.

12. Hose rack With Hose

Hose Rack for dressing high pressure water piping.

13. High Pressure Jet pumps, Pipe, Hose

High Pressure Pipe shall be connected to the above high pressure pump for cleaning of carcass

14. Dispatch rail work

Dispatch rail work Complete Set shall be fabricated from 40 mm GI pipe and MS plate properly galvanized supported at every 1.0 m from top beams by suitable MS brackets and hangers.

15. Insecticutors/ Insect Killers

Electrically operated to catch the fly and other insects.

16. Cleaning Table

Cleaning Table shall be stationery table frame with SS Top.

Buffalo Slaughter House

1. Killing Box

Stunning Box shall be tipping type stunning box to hold animal still for stunning tongs. The box shall be of adequate size and fabricated from suitable steel tubular structures properly galvanized. The tilting shall be manual and with proper counter weight / spring

arrangement. A 2 mm thick stainless steel trough of matching size and sloping properly for blood collection shall be included.

2. Bleeding Platform

Bleeding Platform shall be made of 3mm SS plate approximately 1 meter long which will fix into the floor level. There will be pipe line connection up to outside the building for collection of blood.

3. Electric hoist -1 Ton cap

Electric Hoist shall be of 1 ton capacity for lifting buffalo from killing area on to the bleeding rail.

4. Fixed Dressing platform with knife sterilizer & hand wash basin

Fixed dressing platform shall be made of adequate size and fabricated from suitable MS Steel tubular structures properly galvanized and will be used to perform various dressing operations on dressing rail.

5. **Dressing rail,**

Dressing rail, Galvanized iron pipe, with manual stoppage shall be made of GI pipe and MS plate properly galvanized and will be used to transfer whole animal for de-hiding and other dressing operations.

6. **Trolley**

Trolley (Galvanized wheel type) shall be fabricated and mounded on M.S.pipe with swiveling castor. They shall have a handle.

7. Hand Wash Basin

Hand Wash Basin shall be complete with hot water and cold water connections and valves. The base frame shall be fabricated and properly galvanized (SS-304 make). Proper drainage will be provided.

8. Dressing Hooks

Dressing Hooks of SS-304 make for hanging and moving carcass on to the dispatch rail.

9. Electrical Control Panel

As per the requirement of the slaughterhouse will be designed and installed.

10. Hose rack With Hose

Hose Rack for dressing high pressure water piping.

11. High Pressure Jet pumps, Pipe, Hose

High Pressure Pipe shall be connected to the above high pressure pump for cleaning of carcass

12. Dispatch rail work

Dispatch rail work Complete Set shall be fabricated from 40 mm GI pipe and MS plate properly galvanized supported at every 1.0 m from top beams by suitable MS brackets and hangers.

13. Insecticutors/ Insect Killers

Electrically operated to catch the fly and other insects.

14. Cleaning Table

Cleaning Table shall be stationery table frame with SS Top.

CHAPTER-4

Particulars of Civil Building Works & Their Cost Estimates

Sl. No	Item	Brief Specification	Covered Area in Sq. mtr	Rate Rs/Sq mtr	Total Cost
1	Open Lairage for Sheep(100) & Buffalo(50) with total segregation as per drawing	Ramp for animal unloading, **Floor:** Elevated PCC base with top rough finish,	(150 sq mtr*2)=300	3000	900,000
2	Covered Lairage for sheep(100) & buffalo(50) with total segregation as per drawing with ante mortem inspection facilities	**Floor:** Elevated PCC base with corrugation/top rough. **Railing:** M.S. Pipe Railing with proper painting & finishing all around the lairage with 4 feet height with partitions. **Shed:** Colored GI/Pre-coated Sheet roof covering with MS pipe truss and supports. Height-10 feet **Water 7 Fodder troughs:** Brick work and neat coat cement plaster in water and fodder trough. It must have proper slope for drainage and water feeding pipelines. **Floor drainage:** Open drains on all sides with good slope to carry the semi solids into the ETP. **Retention Area:** It is to be made separately by pipe railing and gate to retain the suspected animals.	(150 sq mtr*2)=300	5000	1,500,000
3	Raceway for buffalo & Sheep with total segregation as per drawing	Elevated PCC base with top rough finish with both sides MSW pipe railings with GI shade and tubular structure.	As per requirement		3,00,000 (L.S)

4	Complete Slaughter House building as per drawing (For Sheep & Buffalo)	RCC Roof Structure of 4.5 mtr height with brick walls ,ceramic tiles on walls up to ceiling height, Ironite RCC smooth flooring with proper slope as per IS 4393,para 7.2.2, central open drainage with hot dipped galvanized gratings duly fitted with exhaust fans and sky lights, ventilation.	(10 m x 30 m) =300 sq mtr	18,000	5,400,000
5	Common Change room with 1 toilets , 1 showers, and 1 urinals	RCC Columns, RCC Roof, Brick walls with ceramic tiles and kota stone flooring with proper slope on floor.	(7.5 m x 2 m) = 15 sq mtr	18,000	270,000
6	Offal Rooms	Colored GI/Pre coated Sheet roof covering with MS Pipe Truss and support with brick partition wall complete with smooth and strong flooring with proper slopes	(30 m x 2 m) = 60 sq mtr 30 m x 2 m = 60 sqmtr Total: 120 sq mtr	5000	600,000
7	Common Foot Bath at Entry to Slaughter House from change room	Brick Machinery work	As per the requirement		35,000 (L.S)
8	Machine Room	RCC columns, RCC Roof, Brick walls, IPS flooring with trench as per the guidelines of Directorate Of Electrical & Safety with ceramic tiles and kota stone flooring with proper slope on floor.	(5 m x 4 m) = 20 sq mtr	18,000	360,000
9	Blood Processing Plant Building	MS tubular structure with GI sheet roofing and PCC flooring with brick masonry walls.	(5.5 m x 3.5) m = 19.25 sq mtr	8000	154,000

10	Drainage System	As per requirement			4,00,000 (L.S)
11	Borewell with complete fittings	As per requirement			1,00,000 (L.S)
12	10 KL Main Water Storage tank (Semi underground with distribution system)	As per requirement			3,00,000 (LS)
13	Internal roads	Well compacted WBM road duly carpeted with Tar	(230 m x 3 m)= 690 sq mtr	3000	2,070,000
14	Boundary wall with gates	Brick Masonry work of 2 mtr height, and 4 gates	275 running mtr (approx)	5000	1,375,000
15	Animal Market (open) with market office, toilet block, rest room and canteen		Around 1000 sq mtr		15,00,000 (LS)
		Estimated Total Civil Cost			**15,264,000**

CHAPTER -5
Particulars of Plant & Equipment & Their Estimated Cost

Sheep/Goat Line			
Sl. No	**Item**	**Quantity**	**Installed cost**
1	Killing Box(manual type)	1 no	550,000
2	Bleeding grating (trough)- SS-304	1 no	150,000
3	Electric hoist-0.5 Ton cap	2 no	400,000
4	Shackles hooks (SS-304)	50 nos	100,000
5	Bleeding Rail (manual - 12 mtr	1 set	850,000
6	Hooks return line(manual)-12 mtr	1 set	650,000
7	Fixed dressing Platform (Railings of SS 304)- 4.5 mtr length	2 no	1,000,000
8	Fixed de-hiding platform(railings of SS-304) -4.5 mtr length	2 no	1,000,000
9	Dressing rail (Manual)-12 mtr	1 lot	900,000
10	Dressing Hooks(SS-304)	100 nos.	150,000
11	Stoppers (SS-304)	5 nos.	100,000
12	Despatch Rail(manual)-9 mtr	1 lot	500,000
13	Trolley (galvanized-wheel type)(SS-304)	5 nos.	300,000
14	Hand wash Basin with electric knife sterilizers (SS304)	4 nos.	320,000
15	Electrical control panel(MCCB/MCB) for slaughter house	1 no	250,000
16	High Pressure Jet pumps	1 no	30,000
17	Hose rack with Hose	1 no	20,000
18	Insect Killer(Pesto flash)	1 lot	50,000
19	Cleaning tables (SS-304)	1 no	200,000
20	Water pipe Line	1 set	500,000
21	Electrical Cable works	1 set	750,000
22	Support Steel Structure	1 set	500,000
Buffalo Line			
23	Killing Box (manual type)	1 no	750,000
24	Bleeding Grating (trough)-SS-304	1 no	150,000
25	Electric hoist- 1 ton cap	2 no	600,000
26	Shackles hooks (SS-304)	50 nos.	125,000
27	Bleeding Rail (manual type)- 12 mtr	1 set	1,000,000
28	Hooks Return Line(manual)-12 mtr	1 set	700,000
29	Fixed dressing platform(railings of SS-304)-4.5 mtr length	2 nos.	1,000,000

30	Fixed Dehiding platform (Railings of SS-304) -4.5 mtr length	2 no	1,000,000
31	Dressing rail line(manual)-12 mtr	1 lot	1,000,000
32	Dressing Hooks(SS-304)	50 nos.	150,000
33	Stoppers (SS-304)	5 nos.	100,000
34	Brisket cutter(Electric)(Imported)	1 no	1,500,000
35	Brisket Cutter Platform(Railings of SS-304)	1 no	500,000
36	Despatch Rail(Manual)-9mtr	1 lot	500,000
37	Trolley(galvanized-wheel type)(SS-304)	5 nos.	300,000
38	Hand Wash basin with electric knife sterilizers (SS304)	4 nos.	320,000
39	Electrical Control panel (MCCB/MCB) for slaughter house	1 no	250,000
40	High Pressure Jet pumps	1 no	30,000
41	Hose rack with Hose	1 no	20,000
42	Insect Killer(Pesto flash)	1 lot	50,000
43	Cleaning table(SS-304)	1 no	200,000
44	Water pipe line	1 set	500,000
45	Electrical Cable Works	1 set	750,000
46	Support Steel Structure section	1 set	500,000
	Common Facilities		
47	ETP-15 KLD a. Bar Screen b. Solid Separator c. Grease Trap d. Aerator tank and motors e. Clarification tank & motors f. Sludge circulation pump g. Sludge drying beds h. sludge pumps i. Chlorine pump j. Blower	1 set	4,500,000
48	Silent D G Set(35 KVA)	1 no	450,000
49	Exhaust fans, tube lights and other electrical fittings	1 set	400,000
50	Blood Processing Plant (capacity: 1000 Ltr/day) 1.Blood collection tank (3mm sheet-SS-304) capacity- 1000 Ltr 2.Blood Pump 3. Agitator 4. Coagulator 5. Vibrating Screen 6.Steam generator with pipes and fittings	1 set	11,000,000
51	Gumboots, Aprons, caps, face Mask 9made of cloth)	25 set	25,000
	Total		**37,640,000**

CHAPTER-6

Manpower Requirement with Estimated Remuneration

The Estimated Manpower Requirement:

Sl. No	Manpower Designation	No Required	Remuneration per head per Month	Total remuneration per Month
1	Manager cum Vet. Officer	1	20,000	20,000
2	Documentation Officer cum Record Keeper	1	8,000	8,000
3	Vet. Inspector	2	10,000	20,000
4	ETP & Blood Processing Plant Operator	4	6,000	24,000
5	Mechanic cum Electrician	3	8,000	24,000
6	Master Butcher/ Molla	2	6,000	12,000
7	Butchers	8	4,000	32,000
8	Sweepers	2	3,000	6,000
9	Watchman	2	4,000	8,000
			Total	**154,000**

CHAPTER-7

Estimated Expenditure per Day for Rated Capacity Production

Sl. No	Details of Expenditure	Rs. Per Day
1	Estimated Manpower Cost	6,160
2	Electrical Consumption : 35 KW x 8 hrs=280 KWH @ Rs 5 per unit	1,400
3	Chemicals & Consumables	300
4	Maintenance	300
	Sub Total	**8,160**
	Add Contingency@10%	**816**
	Total	**8,976** **Say 9,000**

CHAPTER-8

Expected Revenue Earning & Profitability for Rated Capacity Production

Sl. No	Earning as Slaughter Fees	Rs. Per day
1	50 buffalo @ Rs. 65 per day	3,250
2	100 Sheep/Goat @ Rs. 40 per day	4,000
3	Blood Meal Sales 200 Kg @ Rs. 20 per day	4,000
	Total	**11,250**

Therefore, Estimated Gross Income: Rs. 11,250 – Rs. 9,000 = Rs. 2,250 per day

= Around Rs. 56,250 per month.
(Considering 25 days x 2,250)

More revenue can be achieved through the followings:

* Biocomposting of left over Dung & Ingesta for producing Bio-fertilizer. The market value of which is around Rs. 15.00 per KG.

* Charging a market fee of say Rs. 5.00 per small animal & Rs. 10 per large animal from the animal owners which will be sold by the animal owners to meat sellers at the proposed animal market.

* Night stay charges per animal if not sold same day followed by Night stay charges of the above animal owners in the rest room proposed in the animal market.