PROJECT REPORT

Of

WATER PURIFICATION & DISTRIBUTION

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding **Water Purification & Distribution.**

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

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WATER PURIFICATION & DISTRIBUTION UNIT

Water purification is the process of removing undesirable chemicals, biological contaminants, suspended solids, and gases from water. The goal is to produce water fit for specific purposes. Most water is purified and disinfected for human consumption (drinking water), but water purification may also be carried out for a variety of other purposes, including medical, pharmacological, chemical, and industrial applications. The methods used include physical processes such as filtration, sedimentation, and distillation; biological processes such as slow sand filters or biologically active carbon; chemical processes such as flocculation and chlorination; and the use of electromagnetic radiation such as ultraviolet light.

Water purification may reduce the concentration of particulate including suspended particles, parasites, bacteria, algae, and fungi as well as reduce the concentration of a range of dissolved and particulate matter.

The standards for drinking water quality are typically set by governments or by international standards. These standards usually include minimum and maximum concentrations of contaminants, depending on the intended use of the water.

PH Adjustment

Pure water has a pH close to 7(neither alkaline nor acidic). Sea water can have pH values that range from 7.5 to 8.4 (moderately alkaline). Fresh water can have widely ranging pH

values depending on the geology of the drainage basin or aquifer and the influence of contaminant inputs (acid rain). If the water is acidic (lower than 7), lime, soda ash, or sodium hydroxide can be added to raise the pH during water purification processes. Lime addition increases the calcium ion concentration, thus raising the water hardness. For highly acidic waters, forced draft degasifies can be an effective way to raise the pH, by stripping dissolved carbon dioxide from the water. Making the water alkaline helps coagulation and flocculation processes work effectively and also helps to minimize the risk of lead being dissolved from lead pipes and from lead solder in pipe fittings. Sufficient alkalinity also reduces the corrosiveness of water to iron pipes.

Franchisee

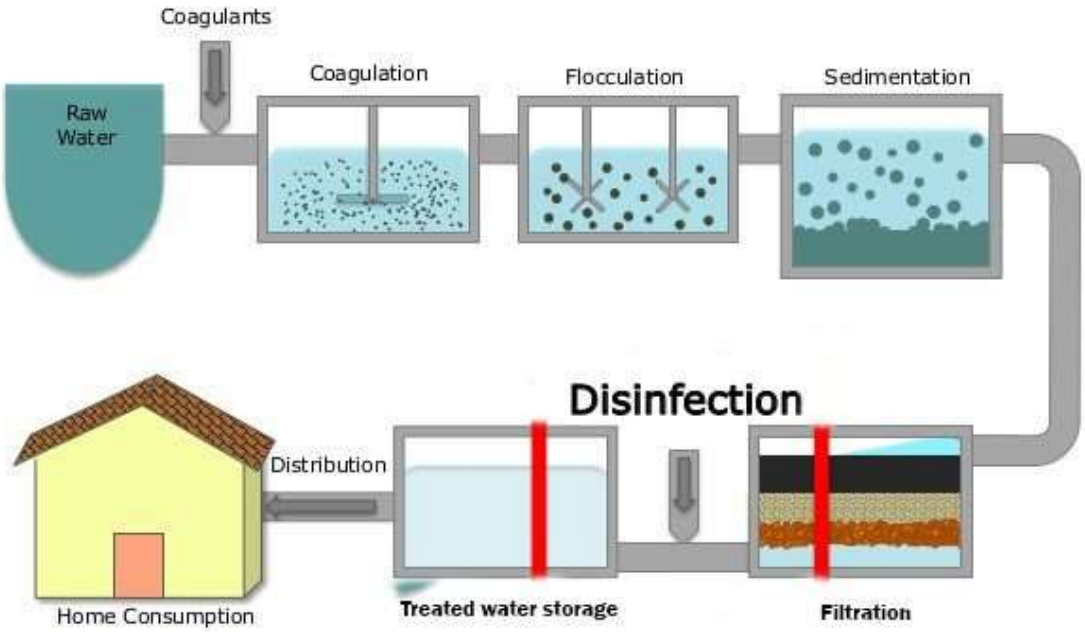
This unit is established after taking franchisee from **Piramal water Pvt. Ltd. (Sarvajal).**

Piramal Sarvajal, seeded by the Piramal Foundation in 2008, is a mission driven social enterprise which designs and deploys innovative solutions for creating affordable access to safe drinking water in underserved areas. Sarvajal is at the forefront of developing technologies and business practices in the safe drinking water sector that are designed to make a purely market-based model sustainable in both rural and urban deployment conditions.

Types of water Units

1. **RO Unit**
2. **Water ATM:** Water ATMs are automated water dispensing units, which provide communities with 24/7 safe water access. They are solar powered and cloud connected, thus enabling remote tracking of the water quality and of each pay per use transaction.

Process of water Purification



1. Aeration:

- Raw water is first collected in large aeration tank and the water is aerated by bubbling compressed air through perforated pipes.
- Aeration removes bad odors and CO2. It also removes metal such as iron, manganese by precipitating then as their respective hydroxides.

2. **Storage or settling:**

- Aerated water is then placed in settling tank and stored for 10-14 days.
- During storage about 90% of suspended solids settle down within 24 hrs and the water becomes clear.
- Certain heavier toxic chemicals also settle down during storage.
- Similarly pathogenic bacteria gradually die and bacterial count decreases by 90% in first in first 5-7 days of storage.

- During storage organic matter present in water is oxidized by microorganisms. Similarly NH3 present is oxidized into nitrate by microorganisms during storage.

3. **Coagulation:**

- Water from storage tank is then placed in coagulation tank and then some precipitating agents such as alum, lime etc are added in water and mixed.
- These precipitating agents form precipitate of Al(OH)3 when dissolved in water.
- Suspended solids absorbs on the surface of precipitate, so gradually mass of precipitate becomes heavier and finally settle down.
- This technique is used to remove very light suspended solids that do not settle by themselves during storage. Furthermore, if negatively charged colloidal impurities are present, they are neutralized by Al+++ ions and settle down.

4**. Filtration**:

- Partially clarified water is then passed through sand gravity filter which removes 98-99% of microorganisms and other impurities.
- Sand gravity water filter:
  - Sand filter is a rectangular tank in which filter bed is made up to 3 layers.
  - Top layer: fine layer of 1 meter thick
  - Middle layer: 0.3-0.5 meter thick layer of coarse sand
  - Bottom layer: 0.3-0.5 meter thick layer of gravel
- There is a collection tank at the bottom of the filter bed to collect filtered water. During filtration filter bed soon gets covered with a slimy layer called vital layer.
- Vital layer consists of thread like algae, diatoms and bacteria.

- During filtration microorganisms presents in vital layer oxidize organic and other matter present in water. For example if NH3 is present, it is oxidized into nitrate.
- Vital layer also helps in filtration of microbial cells.
- If water contains unpleasant odor, activated carbon may be placed in filter bed that removes bad odors.

5. **Disinfection:**

- The filtered water is finally purified by using disinfectants. Eg. Chlorination
- Disinfectant kills pathogenic as well as other microorganism in water.
- After disinfection water is pumped into overhead tank for subsequent domestic distribution.

Machinery & Equipment Required

Machinery		
S.N.	**Particulars**	**Amount**
1	RO unit	336,286.00
2	Chillar	100,000.00
3	Vehicle	400,000.00
4	Camper	150,000.00
	Total	**986,286.00**

Land & Building Required

Building & civil work		
S.N.	**Particulars**	**Amount**
1	Land Construction	300,000.00
2	Borewall	50,000.00
Total		**350,000.00**

Labour Requirement:

4 Manpower is required for the Water purification & distribution unit.

Includes:

3 daily Labour

1 Driver

Water Purification Unit License &registration

For Proprietor:

- Obtain the GST registration.
- Additionally, take the Udyog Aadhar registration.
- Choice of a Brand Name of the product and secure the name with Trademark if required.

Implementation Schedule

S.N.	Activity	Time Required (in Months)
1	Acquisition Of premises	1
2	Construction (if Applicable)	1- 2 Months
3	Procurement & installation of Plant & Machinery	1
4	Arrangement of Finance	1
5	Requirement of required Manpower	1
	Total time Required (some activities shall run concurrently)	2-3 Months

FINANCIAL ASSISTANCE REQUIRED

Term Loan of Rs. 12.48 Lacs and Working Capital limit of Rs. 2.50 Lacs

COST OF PROJECT

PARTICULARS	AMOUNT	AMOUNT	AMOUNT
		10.00%	90.00%
Building Civil Work	3.50	0.35	3.15
Plant & Machinery	9.86	0.99	8.88
Furniture & Fixtures and Other Assets	0.50	0.05	0.45
Working capital	2.78	0.28	2.50
Total	**16.64**	**1.66**	**14.98**

MEANS OF FINANCE

PARTICULARS	AMOUNT
Own Contribution	1.66
Bank Loan	12.48
Working capital Limit	2.50
Total	**16.64**

COMPUTATION OF PROCESS OF WATER

Items to be Sale

Purified Water

machine capacity per day	3000	Litre
machine capacity per annum	1080000	KG
1 Water ATM		
Per ATM capacity per day	750	Liter
Total ATM capacity per Annum	270000	Liter

Water Sales (RO unit +Soochak)

Production	**Capacity**	**water**
1st year	70%	756,000
2nd year	75%	810,000
3rd year	80%	864,000
4th year	85%	918,000
5th year	90%	972,000

ATM Water

Production	**Capacity**	**water**
1st year	70%	189,000
2nd year	75%	202,500
3rd year	80%	216,000
4th year	85%	229,500
5th year	90%	243,000

Fee & tax cost per Liter on RO unit + Soochak			
Year	**Capacity Utilisation**	**Per litre cost**	**Amount (Rs. in lacs)**
1st year	70%	0.087	0.66
2nd year	75%	0.087	0.70
3rd year	80%	0.087	0.75
4th year	85%	0.087	0.80
5th year	90%	0.087	0.85

Fee & tax cost per liter on water ATM			
Year	**Capacity Utilisation**	**Per litre cost**	**Amount (Rs. in lacs)**
1st year	70%	0.067	0.13
2nd year	75%	0.067	0.14
3rd year	80%	0.067	0.14
4th year	85%	0.067	0.15
5th year	90%	0.067	0.16

COMPUTATION OF SALE (Water , RO unit+ soochak)

Particulars	1st year	2nd year	3rd year	4th year	5th year
Process	756,000	810,000	864,000	918,000	972,000
Net Sale	**756,000**	**810,000**	**864,000**	**918,000**	**972,000**
sale price per Liter	1.50	1.50	1.50	1.50	1.50
Sales (in Lacs)	11.34	12.15	12.96	13.77	14.58

COMPUTATION OF WATER ATM SALES

Particulars	1st year	2nd year	3rd year	4th year	5th year
Process	189,000	202,500	216,000	229,500	243,000
Net Sale	**189,000**	**202,500**	**216,000**	**229,500**	**243,000**
sale price per Liter	1.00	1.00	1.00	1.00	1.00
Sales (in Lacs)	1.89	2.03	2.16	2.30	2.43

BREAK UP OF LABOUR CHARGES

Particulars	Wages Per Month	No of Employees	Total Salary
Daily labour	8000	3	24000
driver	9000	1	9000
Total Salary Per Month			33000
Total Annual Labour Charges	**(in Lacs)**		**3.96**

Utility Charges at 100% capacity (per month)

Particulars	value	Description
Power cost per liter	0.03	Rs.
consumption per Annum	1350000	Liter
power Bill per month	40500	Rs.

PROJECTED PROFITABILITY STATEMENT					**(in lacs)**
PARTICULARS	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**
Capacity Utilisation %	**70%**	**75%**	**80%**	**85%**	**90%**
SALES					
Gross Sale					
RO Unit+ Soochak	11.34	12.15	12.96	13.77	14.58
ATM Water	1.89	2.03	2.16	2.30	2.43
Total	**13.23**	**14.18**	**15.12**	**16.07**	**17.01**
COST OF SALES					
Raw Material Consumed	0.78	0.84	0.90	0.95	1.01
Electricity Expenses	0.41	0.45	0.49	0.54	0.59
Depreciation	1.88	1.62	1.39	1.20	1.03
Consumables	0.23	0.24	0.26	0.28	0.29
Repair & maintenance	0.28	0.30	0.32	0.34	0.36
Labour	3.96	4.36	4.79	5.27	5.80
Water	0.26	0.28	0.30	0.32	0.34
other direct expenses	0.46	0.50	0.53	0.56	0.60
Cost of Production	8.27	8.59	8.99	9.47	10.03
GROSS PROFIT	**4.96**	**5.59**	**6.13**	**6.60**	**6.98**
Interest on Term Loan	1.11	0.98	0.70	0.43	0.13
Interest on working Capital	0.28	0.28	0.28	0.28	0.28
Selling & Adm expenses	0.40	0.43	0.45	0.63	0.66
TOTAL	**1.79**	**1.68**	**1.43**	**1.33**	**1.07**
NET PROFIT	3.18	3.91	4.70	5.27	5.92
Taxation				0.06	0.19
PROFIT (After Tax)	3.18	3.91	4.70	5.21	5.73

PROJECTED BALANCE SHEET

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
Liabilities					
Capital					
opening balance		2.34	3.50	5.20	6.91
Add:- Own Capital	1.66				
Add:- Retained Profit	3.18	3.91	4.70	5.21	5.73
Less:- Drawings	2.50	2.75	3.00	3.50	4.00
Closing Balance	2.34	3.50	5.20	6.91	8.64
Term Loan	11.09	8.32	5.55	2.77	0.23
Working Capital Limit	2.50	2.50	2.50	2.50	2.50
TOTAL :	**15.93**	**14.32**	**13.24**	**12.19**	**11.37**
Assets					
Fixed Assets (Gross)	13.86	13.86	13.86	13.86	13.86
Gross Dep.	1.88	3.50	4.89	6.09	7.12
Net Fixed Assets	**11.98**	**10.37**	**8.97**	**7.77**	**6.74**
Current Assets					
Sundry Debtors	2.21	2.36	2.52	2.68	2.84
Cash and Bank	1.74	1.59	1.75	1.73	1.80
TOTAL :	**15.93**	**14.32**	**13.24**	**12.19**	**11.37**

PROJECTED CASH FLOW STATEMENT

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
SOURCES OF FUND					
Own Margin	1.66				
Net Profit	3.18	3.91	4.70	5.27	5.92
Depreciation & Exp. W/off	1.88	1.62	1.39	1.20	1.03
Increase in Cash Credit	2.50	-	-	-	-
Increase In Term Loan	12.48	-	-	-	-
TOTAL :	**21.70**	**5.52**	**6.09**	**6.47**	**6.95**
APPLICATION OF FUND					
Increase in Fixed Assets	13.86				
Increase in Debtors	2.21	0.16	0.16	0.16	0.16
Repayment of Term Loan	1.39	2.77	2.77	2.77	2.54
Drawings	2.50	2.75	3.00	3.50	4.00
Taxation	-	-	-	0.06	0.19
TOTAL :	**19.95**	**5.68**	**5.93**	**6.49**	**6.89**
Opening Cash & Bank Balance	-	1.74	1.59	1.75	1.73
Add : Surplus	1.74	(0.16)	0.16	(0.02)	0.06
Closing Cash & Bank Balance	**1.74**	**1.59**	**1.75**	**1.73**	**1.80**

COMPUTATION OF WORKING CAPITAL	
Turnover Method	(In Lacs)
(i) Projected Sales	13.23
(ii) Working Capital Requirement 25% of Projected Sales	3.31
(iii) Margin 5% of Projected Sales	0.66
(iv) MPBF	2.65
Working Capital Limit Required	2.50

COMPUTATION OF DEPRECIATION

Description	Building	Plant & Machinery	Furniture	TOTAL
Rate of Depreciation	**10.00%**	**15.00%**	**10.00%**	
Opening Balance	-	-	-	-
Addition	3.50	9.86	0.50	13.86
Total	3.50	9.86	0.50	13.86
Less : Depreciation	0.35	1.48	0.05	1.88
WDV at end of Year	**3.15**	**8.38**	**0.45**	**11.98**
Additions During The Year	-	-	-	-
Total	3.15	8.38	0.45	11.98
Less : Depreciation	0.32	1.26	0.05	1.62
WDV at end of Year	**2.84**	**7.13**	**0.41**	**10.37**
Additions During The Year	-	-	-	-
Total	2.84	7.13	0.41	10.37
Less : Depreciation	0.28	1.07	0.04	1.39
WDV at end of Year	**2.55**	**6.06**	**0.36**	**8.97**
Additions During The Year	-	-	-	-
Total	2.55	6.06	0.36	8.97
Less : Depreciation	0.26	0.91	0.04	1.20
WDV at end of Year	**2.30**	**5.15**	**0.33**	**7.77**
Additions During The Year	-	-	-	-
Total	2.30	5.15	0.33	7.77
Less : Depreciation	0.23	0.77	0.03	1.03
WDV at end of Year	**2.07**	**4.38**	**0.30**	**6.74**
s	-	-	-	-

Total	2.07	4.38	0.30	6.74
Less : Depreciation	0.21	0.66	0.03	0.89
WDV at end of Year	**1.86**	**3.72**	**0.27**	**5.85**
Less : Depreciation	0.19	0.56	0.03	0.77
WDV at end of Year	**1.67**	**3.16**	**0.24**	**5.07**
Less : Depreciation	0.17	0.47	0.02	0.67
WDV at end of Year	**1.51**	**2.69**	**0.22**	**4.41**

CALCULATION OF D.S.C.R

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
CASH ACCRUALS	5.06	5.52	6.09	6.41	6.76
Interest on Term Loan	1.11	0.98	0.70	0.43	0.13
Total	6.17	6.51	6.80	6.84	6.89
REPAYMENT					
Instalment of Term Loan	1.39	2.77	2.77	2.77	2.54
Interest on Term Loan	1.11	0.98	0.70	0.43	0.13
Total	2.50	3.75	3.48	3.20	2.67
DEBT SERVICE COVERAGE RATIO	**2.47**	**1.73**	**1.96**	**2.14**	**2.58**
AVERAGE D.S.C.R.	**2.18**				

REPAYMENT SCHEDULE OF TERM LOAN

					Interest	10.00%
Year	**Particulars**	**Amount**	**Addition**	**Total**	**Repayment**	**Closing Balance**
ist	Opening Balance					
	1st month	-	12.48	12.48	-	12.48
	2nd month	12.48	-	12.48	-	12.48
	3rd month	12.48	-	12.48	-	12.48
	4th month	12.48	-	12.48		12.48
	5th month	12.48	-	12.48		12.48
	6th month	12.48	-	12.48		12.48
	7th month	12.48	-	12.48	0.231	12.25
	8th month	12.25	-	12.25	0.231	12.01
	9th month	12.01	-	12.01	0.231	11.78
	10th month	11.78	-	11.78	0.231	11.55
	11th month	11.55	-	11.55	0.231	11.32
	12th month	11.32	-	11.32	0.231	11.09
				1.11	1.386	
2nd	Opening Balance					
	1st month	11.09	-	11.09	0.231	10.86
	2nd month	10.86	-	10.86	0.231	10.63
	3rd month	10.63	-	10.63	0.231	10.40
	4th month	10.40	-	10.40	0.231	10.17
	5th month	10.17	-	10.17	0.231	9.94
	6th month	9.94	-	9.94	0.231	9.70
	7th month	9.70	-	9.70	0.231	9.47
	8th month	9.47	-	9.47	0.231	9.24
	9th month	9.24	-	9.24	0.231	9.01
	10th month	9.01	-	9.01	0.231	8.78
	11th month	8.78	-	8.78	0.231	8.55
	12th month	8.55	-	8.55	0.231	8.32

					0.98	**2.773**	
3rd	Opening Balance						
	1st month	8.32	-	8.32	0.07	0.231	8.09
	2nd month	8.09	-	8.09	0.07	0.231	7.86
	3rd month	7.86	-	7.86	0.07	0.231	7.62
	4th month	7.62	-	7.62	0.06	0.231	7.39
	5th month	7.39	-	7.39	0.06	0.231	7.16
	6th month	7.16	-	7.16	0.06	0.231	6.93
	7th month	6.93	-	6.93	0.06	0.231	6.70
	8th month	6.70	-	6.70	0.06	0.231	6.47
	9th month	6.47	-	6.47	0.05	0.231	6.24
	10th month	6.24	-	6.24	0.05	0.231	6.01
	11th month	6.01	-	6.01	0.05	0.231	5.78
	12th month	5.78	-	5.78	0.05	0.231	5.55
					0.70	**2.773**	
4th	Opening Balance						
	1st month	5.55	-	5.55	0.05	0.231	5.31
	2nd month	5.31	-	5.31	0.04	0.231	5.08
	3rd month	5.08	-	5.08	0.04	0.231	4.85
	4th month	4.85	-	4.85	0.04	0.231	4.62
	5th month	4.62	-	4.62	0.04	0.231	4.39
	6th month	4.39	-	4.39	0.04	0.231	4.16
	7th month	4.16	-	4.16	0.03	0.231	3.93
	8th month	3.93	-	3.93	0.03	0.231	3.70
	9th month	3.70	-	3.70	0.03	0.231	3.47
	10th month	3.47	-	3.47	0.03	0.231	3.23
	11th month	3.23	-	3.23	0.03	0.231	3.00
	12th month	3.00	-	3.00	0.03	0.231	2.77
					0.43	**2.773**	
5th	Opening Balance						
	1st month	2.77	-	2.77	0.02	0.231	2.54
	2nd month		-		0.02	0.231	2.31

	2.54		2.54			
3rd month	2.31	-	2.31	0.02	0.231	2.08
4th month	2.08	-	2.08	0.02	0.231	1.85
5th month	1.85	-	1.85	0.02	0.231	1.62
6th month	1.62	-	1.62	0.01	0.231	1.39
7th month	1.39	-	1.39	0.01	0.231	1.16
8th month	1.16	-	1.16	0.01	0.231	0.92
9th month	0.92	-	0.92	0.01	0.231	0.69
10th month	0.69	-	0.69	0.01	0.231	0.46
11th month	0.46	-	0.46	0.00	0.231	0.23
12th month	0.23	-	0.23	0.00	0.231	-
				0.13	**2.54**	

DOOR TO DOOR	60	MONTHS
MORATORIUM PERIOD	6	MONTHS
REPAYMENT PERIOD	54	MONTHS

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