PRE-FEASIBILITY STUDY

ON

PRODUCTION OF BOTTLED WATER AS PER WHO

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Note: All Services / information related to PM's Youth Business Loan are <u>Free of Cost</u>

April, 2014

Content

A. Executive Summary

A. Introduction

This report is prepared to support the Business Plan Development on the basis of SMEs for Youth of Pakistan through Prime Minister's Youth Business Loan Scheme. The Pre-feasibility report according to the Ministry's required template was initiated by following project Management Methodology after getting go-head decision and with the reference of meeting held on 08-05-2014 in the Office of Director General, PCSIR, Laboratories, Complex, Karachi. Then, it was planned, executed and closed through monitoring. NIDO's Pre-feasibility study Method was adopted in planning stage to get the technical information. There were two teams; team-A of two highly experienced and qualified chemical engineer and scientist and team-B of a chemical engineer with supporting staff members. Team-A was responsible for planning, monitoring & controlling and report preparation While Team-B for executing the tasks as per plan. The Report focuses on the techno-economic feasibility and associated with other options; social, financial, technical, marketing, regulatory, risk, environmental and geographical factors. In addition, the report briefly outlines management, training, policy, and institutional factors that affect the ability of investors in plants to achieve the project objectives.

B. KLC, PCSIR's Water Technology

Drinking water crises is a big issue in Pakistan. The market of purified water in different size of bottles was more than 90 million liters in 2005 through 200 registered companies but only 27 were maintaining standard.

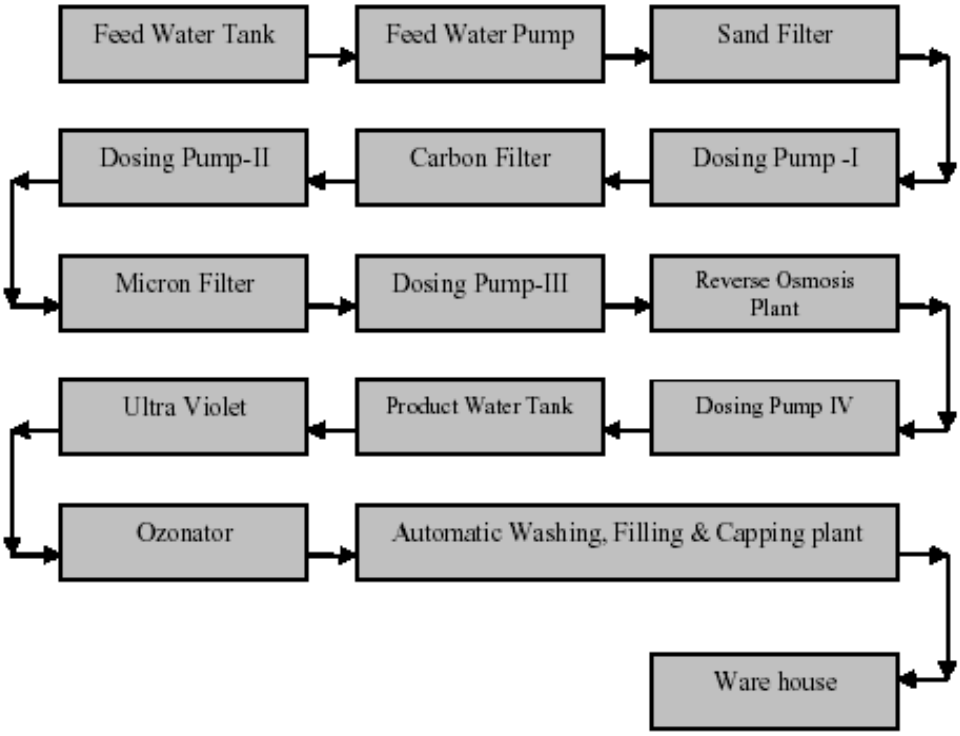
PCSIR has the resources; technology, skills, equipment and testing facilities to produce a good quality of water by monitoring and controlling chemicals and microbiological parameters by physical means [Annexure-I]. In the present situation of the country purified water is highly demanded.

A techno-economic feasibility report is calculated on the basis of primary and secondary data generation, rental building, purchased plant & equipment and up gradation of processing hall as per GMP and source of water [Annexure-II].

C. Project Information

- Plant Capacity 168000Litre/month
- Electricity Load 1500KW/month
- Total Capital Rs.19,99,000
- Net Profit per month: Rs.1,56,927 /month
- Profit after tax Rs.142804/month
- Profit per year Rs.17,13,648
- Pay back time ≈1.2 years

D. Processing Flow Diagram of Bottled Water



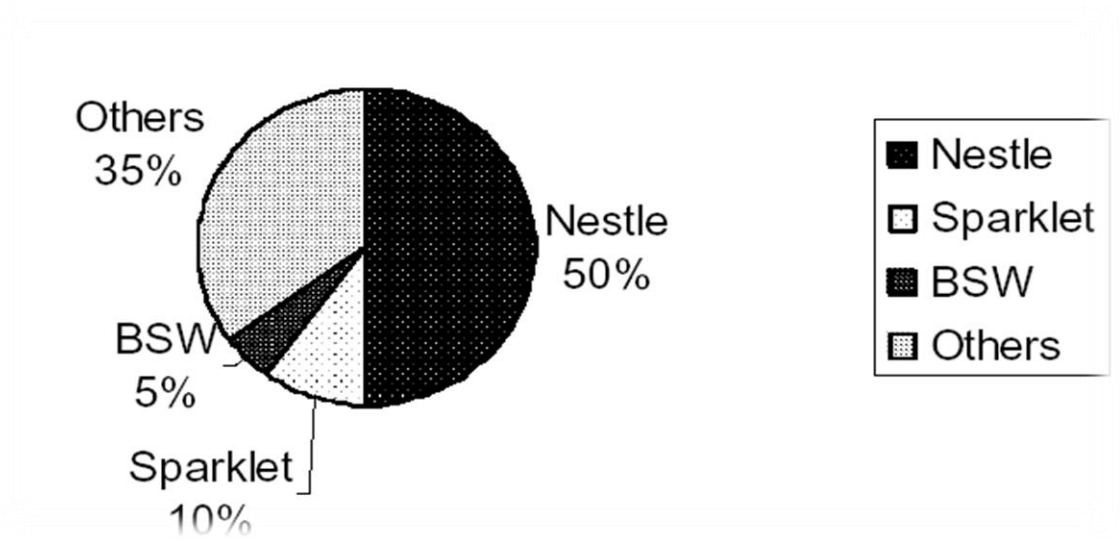
2. Market Analysis

A. Bottled Water Market In Pakistan

- Pakistan has low consumption of bottled water, market for bottles water was 33 million liters of consumption in 1999
- Mineral water import in Pakistan was Rs. 12.856 million in 1995-96
- 70 million in 2003 or 0.5 liter per capita
- Production cost is Rs.12.51 for 1.5 liter and sold in Rs22 profit is shared b/w middle man and producing corporation, with Rs.6.66 – 7.08
- In Pakistan there are 20 permanent players, official figures show 26 corporation, while in summer time this number increase up to 70.

- In 2005, PSQCA admitted that 200 companies are selling bottled water in Pakistan, but only 27 are registered [Annexure-III] as maintaining standard, Nestle estimated 150 water brands[1].

B. Market Segment& Competitor



C. Market Projection

TV Advertisement	**40%**
SITE Advertisement	10%
Newspapers	38%
Magazines	4%
Point of Sales Marketing	8%

[1]**Source: Drinking water crises in Pakistan and the issue of bottled water by Niles Rosemann, April 2005**

3. Economic Analysis

Capital Investment @ 168000liters/month/192hrs in single shift

A. Fixed Capital:

Fixed Capital included advance for rental building of 2000sq.ft, RO Plant, Packaging material (empty bottles of food grade pvc),Up gradation of processing hall according to GMP(Good manufacturing Practice), Licensing fee/Regularity Require[Annexure-IV],Water reservoir and Miscellaneous

Sub total **Rs 17, 58,000.** [Annexure-V]

B. Working Capital (for One Month):

Working Capital included Rent, Raw water, Utilities (Electricity, water and gas), Quality assurance Charges, Depreciation cost of Bottles, Depreciation cost of Equipment, Depreciation cost of Building, Manpower, General Expenses included Marketing &Distribution charges

Sub total **Rs. 2, 41,000** [Annexure-VI]

C. Technology Transfer Fee Not included

D. Total Capital Investment **Rs. 19,99,000**/

4. Financial Analysis and Profitability@ 168000liters/month/192hrs in single shift

▪ Manufacturing cost @1.5/liter	Rs.2,52000
▪ Selling price @Rs. 3.4/litre	Rs.5,71,200
▪ Profit @Rs.1.9/lire	Rs.3,19,200
▪ Royalty for PCSIR	Rs. 20,000
▪ Logistic @15% of selling	Rs. 88,000
▪ Interest on loan @8%	Rs.13440
▪ Loan return in 8 years	Rs.20833
▪ Advertisement	Rs.20,000
▪ Net Profit per month:	Rs.1,56,927
▪ Tax on net profit @9.0%	Rs.14,123
▪ Profit after tax	Rs.142804
▪ Profit per year	Rs.17,13,648
▪ Pay back time	≈1.2 years
▪ ROI /Cash Flow	85% [Annexure-VII]

References:

1. Plant Design and economics for chemical engineers, 5th Edition by Max S. Peters.
2. Perry's Chemical Engineering Handbook, 6th Edition by Robert H. Perry
3. Sherev's Chemical Process Industries, 5th Edition by George T. Austin
4. Product & process design principles, 2nd Edition by warren D. Seider.
5. Process plant design, reprinted, 1983, J.R. Buckhurst.
6. Manual for the preparation of Industrial Feasibility Studies, United Nations, New York 1978, Dr. Abd-El Rahman Khan, Executive Director

Annexure-I

Physical, Chemical and Microbiological Standard Requirements for Mineral Water

Requirements	Units
pH Range	7.0-80
Total Dissolved Solids (TDS) Max	200 mg/L
Total Hardness as $CaCo_3$ Max	40 mg/L
Chemical Requirements	
Nitrite (NO_2)	0.020 mg/L
Chloride	40 mg/L
Sulphate	10 mg/L
Sodium	20 mg/L
Potassium	10 mg/L
Magnesium	5 mg/L
Calcium	20 mg/L
Microbiological Requirements	
Escherichla Coli	0/250 ml
Total Coliforms	0/250 ml
Entercocci (Streptocoi	0/250 ml
Sporulated SRA	0/100 ml
Pseudomonas Aeruginosa	0/250 ml
Parasites and pathogenic micro organisms	Shall be free

Annexure-II

Source of Water

- Tube well excavates 56-85 litres per second.
- In 08 hrs of operation a tube well can provide 1.5 -2.0 million litres of water.

Sources	Pipe (Nul)	Hand Pump	Well	Others
Sindh	41.70	36.51	8.54	13.24
Rural	16.81	52.22	12.78	18.18
Urban	74.53	15.88	2.98	6.76

Annexure-III

Local and Imported Brands Available in the market
Niagra
Nestle Pure
Ava
Sparklets
Masafi
Aqua Safe
Cool
Ab-e-Hayat
Rainbow
Pearl
Askari
Safa
Zam Zam
Fresh
Musaffa
Mineral Plus
Wellgreen
Aqua Flow
Max Wellpur
Himalaya
Brecon Carreg
Evian
Perrier
Oslo
Vital
Classic
Blue ever pure
Jeema
Vittel
Gulfa
Volvic
Highland spring
SPA
Hayat

Annexure-IV

Regulatory Requirements to Market Mineral Water

In addition to the PS:1485-1994 ® for Pakistan Standard for the labeling of Pre-Packaged Foods, the following provisions shall apply.

a) Name of the product for example bottled drinking water
b) Brand name or trade name
c) Net Volumes in System International/Metric System
d) Name and address of the manufacturer
e) Batch Number or Code Number
f) Date of expiry
g) Chemical composition e.g. Sulphate, Magnesium, Potassium etc.
h) Pakistan Standard Number.

i) Water Specification

j) Certificate mark of Pakistan Standards & Quality Control Authority

k) A brief introduction of the company with address

l) Website address of the company

Annexure-V

Fixed capital:

1. Rental Building (2000 sq.ft.)	Rs.180000
2. RO Plant	Rs.5,20,000
3. Empty bottles (19 liters)1000	Rs.500000
4. Up-gradation of production hall	Rs.250,000
5. Licensing fee	Rs.140,000
6. Water reservoir	Rs.60,000
7. Miscellaneous @10% of 1-7	Rs.108,000
Sub total	**Rs 17, 58,000.**

Annexure-VI

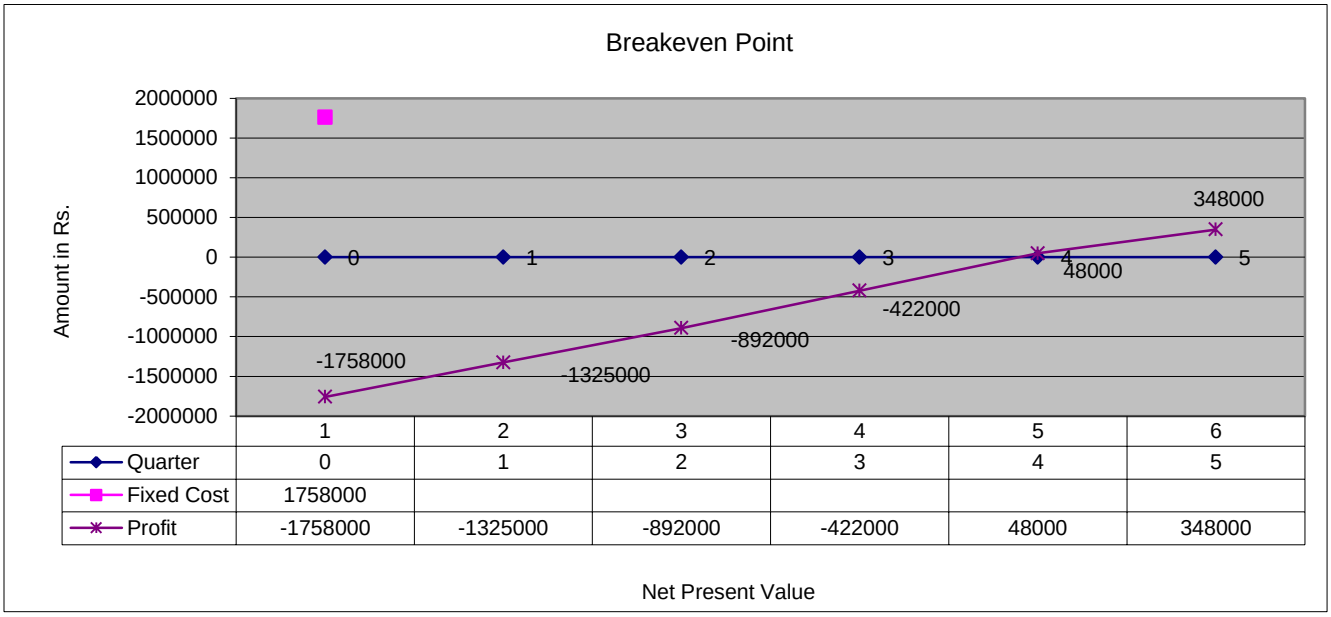
Working capital (for One Month):

1. Rent	Rs.30000
2. Raw water	Rs.5000
3. Utilities(Electricity, water and gas)	Rs.33000
4. Quality assurance Charges	Rs.12000
5. Depreciation cost of Bottles	Rs.15,000
6. Depreciation cost of Equipment	Rs.13,000
7. Depreciation cost of Building	Rs.10,000
8. Manpower	
i. Scientist	Rs.32,000
ii. Plant Technologist	Rs.17,000
iii. Operator(01)	Rs14,000
iv. Labor(02)	Rs.18,000
v. A/C Asstt /Computer operator(01)	Rs.14,000
vi. Peon(01)	Rs.8,000
9. General Expenses included Marketing & Distribution charges	Rs.20,000
Sub total	**Rs. 2, 41,000**

Annexure-VII

Cash Flow

Quarter	0	1	2	3	4	5	6	7
Fixed Cost	1758000							
Product Cost		1280000	1280000	1280000	1280000	750000	750000	1986480
Revenue		1713000	1713000	1750000	1750000	1050000	1050000	5625000
Profit	-1758000	-1325000	-892000	-422000	48000	348000	648000	4286520



Annexure-VIII

For 8 years

Project Cost	IRR	Payback Period (Years)	NPV
Rs. 2.0 million	21%	1.5	Rs.2.00 million

For 2 years

Project Cost	IRR	Payback Period (Years)	NPV
Rs. 2.0 million	88%	1.5	Rs.2.00 million