Water, everywhere!

Teaching Objectives:

This case is intended for use in Financial Management and Advanced Financial Management Courses for teaching the concept and application of Investment Appraisal.

Key Issues:

Pricing Constraints, Low Profitability, Loan Commitments.

Abstract:

Mani, a farmer, saw business opportunity in processing and selling packaged water in a remote town that was deprived of potable water. The business was successful until too many players entered the small market. Faced with dwindling sales and accumulated losses, Mani had to quickly find a way to bridge the gap between demand & supply and regain the lost foothold to pay off his debts. In order to increase the sales and revenue, he had to decide between scaling up the operations and making additional investments to enter new product segments in water sales.

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Mani was checking the stock level in his water treatment plant when he received a call from the bank manager. It was a call that Mani had dreaded during the last few days. Mani had availed a loan from that bank two years ago for starting his business and he had defaulted on the last two EMI repayments. He was helpless since the business was dull and there was hardly any surplus cash to repay the loan. Bank officials were initially considerate since they were aware of the developments in that locality and they allowed him to repay two EMIs together. However, the situation worsened and Mani was not able to make the payments.

The manager was polite but firm in his message. He asked Mani to repay both EMIs within a week or face legal action. Mani muttered in the affirmative and hung up the phone. He sat up and started analysing the options. After all, he was known for his unconventional approach in his native village, Kalayarkoil. He mulled over the situation which prompted him to invest in a water treatment plant. None of his friends or family members were entrepreneurs when he took a decision to start his own business. Like most of the other villagers they were mainly dependent on agricultural income for their livelihood. Mani was educated up to high school and had always dreamt about becoming a businessman. He was wary of subsisting on agricultural income or income from micro ventures. Some of his friends engaged themselves in petty trades during lean seasons when there was not much agricultural work. A few worked on the lands of other agriculturalists for additional income. None of these choices were appealing for Mani. His lateral thinking made him see an opportunity where others saw a problem.

Kalayarkoil was a part of one of the most backward districts in India i.e. Sivaganga that faced perennial water shortage. Some, who had resources, procured bottled water in 20-liter cans from the nearby Sivaganga municipality. Many others had to fetch water from nearby agricultural wells and ponds, though the cleanliness of such sources was questionable. They were not willing to travel a few kilometers on a regular basis just to procure bottled water. Mani saw this situation as a great chance to start his business. He decided to buy bottled water on wholesale basis from Sivaganga and resell it in his village. The investment requirement was less and the profit potential appeared lucrative. The supplier allowed him to procure up to 100 cans of 20-liter capacity on an initial deposit of Rs. 10,000. He was also given one-week time to pay for the merchandise. To begin with, Mani procured 50 cans and stocked them at his house. He sold the cans

from his house and decided against door-to-door delivery to reduce the expenses. He demanded a deposit of Rs. 100 per can and sold them at a price of Rs. 40 per can. He had procured them at a cost of Rs. 30 per can.

Mani thought that he would be able to sell about 10 cans per day and that he could make a profit of about Rs. 500 within a week. During the first few days there was not much activity. A few neighbors bought the cans and the whole idea looked like a failure since the supplier would demand Rs. 15,000 (50 cans x Rs. 30 per can) in a week's time for the cans that Mani had bought from him. Mani was not deterred. He pasted handwritten notices near grocery shops and bus stops. He distributed the notices to household. He contacted the supplier and sought two days more time for settling the payment. However, this turned out to be an unnecessary request. On the same day he sold 25 cans and on the next day he sold the remaining cans. Eventually, he had to turn back a few customers and to them he promised to deliver the cans at doorstep by evening.

He rushed to the supplier and bought 50 more cans. On the way home he delivered the cans to those whom he had turned back earlier in the day. He stocked the remaining cans at his house. Next day, he encountered both new purchases and repeat purchases. More villagers started buying the water cans since it was convenient and hygienic. Shop owners and residents from the nearby villages also started buying from him. Within a few months' time he was selling about 500 can per day. Mani was overwhelmed by the acceptance rate and high demand for bottled water. He guessed that there would soon be more demand and sought to capitalize the situation by making quick moves. One of the options he considered was to invest in a mini truck that could be used for door-to-door delivery in the nearby villages. In that case he would have to employ a person who would drive the truck and also load/unload the water cans. He was willing to pay Rs. 6,000 as salary and estimated that fuel and maintenance expenses would be about Rs. 15,000 per month. Enquiry at the local bank revealed that he could buy the truck on loan and repay through EMIs of about Rs. 6,000.

The second option was more ambitious; he envisaged setting up a water bottling plant himself. Being educated up to high school he collected some details about water purification plants. He realised that he would have to register his firm as an SSI (Small Scale Industry) unit and obtain certificates from Bureau of Indian Standards and Pollution Control Board. Further he required laboratory certificate and pest control certificate. He thought of focusing only on 20-liter cans and not on smaller can sizes or water packets. Though a huge demand existed for one-liter cans and water packets he ruled out those options since that would necessitate additional investment and intense marketing efforts.

An investment of about Rs. 36,00,000 (Refer Table 1) was required for a 2,000 liter per hour plant. He had saved about Rs. 500,000 in the past few months and assessed that he would further be able to raise Rs. 400,000/- by monetizing a part of his farmland. He could raise the remaining capital as bank loan at an annual interest rate of 14%. He relied on the information provided in the website http://mineralwaterprojectinformation.org and anticipated a Return on Investment (ROI) of 30% and pay back period of about 40 months. He would have to earn a profit of Rs. 87,500/- per month to reach this target. He wasn't concerned much since his current profit was more than Rs. 150,000/- per month sans manufacturing expenses.

The second option appeared very attractive and he decided to invest in the water purification plant. He acquired the necessary land on lease and the plant was commissioned within a few months. It operated for one 8-hour shift rolling out 100 cans per hour. In a day, the plant was able to process 800 cans of water. Mani wasn't wrong; the demand increased from an average of 500 cans per day to 1,000 cans per day, as he expanded his operations in the nearby villages. He was glad that he had made the right decision and contemplated the idea of running a second shift to expand his reach further. But, market is not always kind to the players. The fact that he was able to earn more than 30 rupees profit per can (Refer Table 2) proved to be too lucrative to be left alone and others players entered the market quickly. In two years' time there was a water purification plant almost on every vacant land in the village. It became difficult for Mani to sell his

water cans at the same price. He had to eventually reduce the price to Rs. 25/- per can. Even that was ineffective to sustain the business.

Soon, the other players were selling the purified water in pots at a throwaway price of five rupees and that too in push carts. It cost about four rupees to process a 20-liter can and they were selling it in unpacked stage with one rupee margin. Buyers didn't have to make a security deposit and didn't have to rely on one player for their requirement. They preferred buying this water owing to cost advantage and flexibility. The demand for Mani's water cans dwindled to about 20 per day. He was faced with multiple challenges. He had to quickly find alternate markets which would be operationally and monetarily viable, and repay the loan too.

Questions:

1. How long would it take for Mani to repay the loan at the current demand level?
2. What would be the Net Present Value (NPV) of the project at the current level of ROI and earlier level of ROI?
3. What changes should be made in the 4Ps of the product to increase the ROI?
4. If Mani is able to market all the produce at a price of Rs. 20 per can when would the project pay itself back?

Annexure

Table 1 : Estimated Cost of New Bottling Plant

	2000 LPH Standard Plant	2000 LPH Economy Plant	Just Jars Plant
Description	Bottles, Jar, Pouch, with Bottle Making Machine	Bottle, Jar, Pouch, WITHOUT Bottle Making Machine	20-liter Jar Filling Line
Building Cost Calculated @ Rs. 800/- per Sq ft.	3000 sq. ft. (Rs. 24 Lakhs)	2000 sq. ft. (Rs. 16 Lakhs)	2000 sq. ft. (Rs. 16 Lakhs)
Machinery Cost	Rs. 40 Lakhs	Rs. 26 Lakhs	Rs. 20 Lakhs
Manpower	Moderate, 3 Managerial, 7 Workers	Moderate , 2 Managerial, 6 Workers	Moderate, 1 Managerial, 5 Workers
List of Machinery	1. Water Treatment Plant 2. Bottle Blowing Unit 3. Bottle Filling Machine (30 BPM Auto) 4. Pouch Packing Machine 5. Ink Jet Coder	1. Water Treatment Plant 2. Bottle Filling Machine 18 (BPM Semi-Auto) 3. Pouch Packing Machine	1. Water Treatment Plant 2. Jar Rinse-Fill-Capping Machine (Auto)
Remarks	Most Feasible	Bottle Cost High as there is No Blowing Facility	Focussed, but not equipped to handle all types of demand

(Source: http://mineralwaterprojectinformation.org)

Table 2 : Estimated Expenses

S. No.	Description	Cost [Rs]
1	Cost of Water	0.60
2	Cost of Maintenance	1.00
3	Transportation	1.00
4	Interest on Capital	0.60
5	Miscellaneous Expenses	0.40
6	Total Expenses	3.60

(Source: http://mineralwaterprojectinformation.org)

References:

1. http://mineralwaterprojectinformation.org
2. http://en.wikipedia.org/wiki/Sivagangai_district

Teaching Note :

Discussion could be commenced with an introduction to project evaluation and about the various techniques that could be used for project evaluation such as Payback Period, Discounted Payback Period, Internal Rate of Return, Net Present Value etc. In the second stage, pros and cons of each method could be discussed. In the third stage, suitability of different techniques in various situations could be explained. The importance of choosing an appropriate discount rate for NPV calculation could be deliberated in the next stage along with the notion of project life span. Here, the difference between bank loan rate and cut off rate could be explained. Subsequently, the focus could be shifted to choice of strategic alternatives such as additional investment, development of new distribution channel, introduction of new product line etc.

In this case, the payback period could be calculated by taking the lowest demand level of 20 cans per day as input for revenue computation. However, from a practical viewpoint at a demand level of 20 cans per day even the EMI payment for bank loan cannot be made.

Demand	=	20 cans per day ~ 7300 cans per year
Selling price	=	Rs. 25 per can
Total expenses	=	Rs. 3.60 per can
Profit per can	=	Rs. 21.40 (25 – 3.60)
Annual profit	=	Rs. 1,56,220 (7300 × 21.40)
Payback period	=	22.4 years (35,00,000 ÷ 1,56,220)
Original estimate	=	40 months (before the current crisis was encountered)

Likewise, assumptions could be made about lifespan of the project and the discount rate. Since, the post-crisis cash inflows are very low the NPV would be negative implying that the project is not suitable for investment at a demand level of 20 cans per day.

Project life span	=	5 years
Return on investment	=	30% p.a.
Net cash inflow	=	Rs. 1,56,220 p.a.
NPV	=	$-35,00,000 + \Sigma [(1,56,220) / (1+0.3)^{i}]\ (i = 1 \text{ to } 5) = -31,19,448$

Yet, as the investment has already been made, turnaround strategies must be evaluated and implemented based on viability. One strategy would be to reduce the profit margin per can and reduce the selling price to the maximum extent possible. As water is an essential commodity lower prices would lead to higher sales and the decline in profit margin could be compensated by increased sales volume. This strategy could be implemented by expanding the presence in nearby markets.

Example:

Expenses	=	Rs. 2.10 per can

(Cost of water, cost of maintenance, transportation expenses and miscellaneous expenses could be reduced by 50%)

Selling price = Rs. 20 per can

Profit = Rs. 17.90 per can

Expected sales = 100 cans per day

Expected profit = Rs. 6,53,350 p.a. (17.9 × 100 × 365)

Payback period = 5.4 years (35,00,000 / 6,53,350)

NPV = $-35,00,000 + \Sigma [(6,53,350) / (1+0.3)^{i}]$ (i = 1 to 5) = -19,08,439

As seen above, the NPV is negative still. Yet another strategy that could be considered is to make additional investment to manufacture 300 ml and 500 ml bottles. These small bottles are commonly used in social gatherings and the profit margin on smaller bottles would be relatively higher than 20-litre cans. Though this is a risky decision, the uncertainty of catering to the needs of a single market with just one product i.e. 20-litre bottle can be avoided in the long-term.

Investment already made = Rs. 35,00,000

Additional investment = Rs. 6,00,000

Variables	300 ml bottle	500 ml bottle	20 litre can
Estimated sales per month	2,000	2,000	3,000
Expected selling price (in Rs.)	3	5	20
Expected expenses (in Rs.) **	1 (0.1+0.25+0.25+0.2+0.1)*	1.2 (0.15+0.4+0.25+0.25+0.15)*	3.6 (0.6+1+1+0.6+0.4)*
Expected profit (in Rs.)	2	3.8	16.4
Profit per annum (in Rs.)	48,000 (2,000 x 2 x 12)	91,200 (2,000 x 3.8 x 12)	5,90,400 (3,000 x 16.4 x 12)
Total profit p.a. (in Rs.)	7,29,600		

* Cost of water + cost of maintenance + transportation + interest + miscellaneous expenses

** Typically, higher cost is incurred for smaller bottles.

Payback period = [35,00,000 + 600,000] / 7,29,600 = 5.6 years

NPV = $-41,00,000 + \Sigma [(7,29,600) / (1+0.3)^{i}]$ (i = 1 to 5) = - 23,22,694

Here too the NPV is negative indicating that the project is unviable at the current demand level. Though this is a reflection of the real life situation, the choice of cut off rate and life span of the project are two other factors that would influence the investment decision. Since there are too many players in a very small geographical area, the cut off rate of 30% is rather unrealistic. Hence, the cash flows could be discounted with a cut off rate that is one/two percent higher than the bank loan rate. By extending the project life to 12 years a positive NPV of about Rs. 29,536 could be achieved at 14% cut off rate. Various permutations and combinations of the life span and cut off rate could be evaluated to find a realistic solution.

Manufacture of water sachets and 1-litre bottles could be avoided since the product segments are rather different. These products would add to the complexity, since an entirely new distribution network must be developed. Moreover, the resellers would expect credit facilities and the margin on water sachets would have to be low as it caters to a different customer segment. In case of 1-litre bottles, it would be difficult to compete with the established brands. Hence, that segment could be avoided and 300 ml bottles and 500 ml bottles can be manufactured. The marketing could be done by fostering a relationship with marriage halls and catering contractors.