

CASE ANALYSIS OF DEVELOPING WATER TREATMENT PROJECT IN GILI TRAWANGAN, NORTH LOMBOK

Yonathan Adiputra Susanto and Harimukti Wanderbori
School of Business and Management
Institut Teknologi Bandung, Indonesia
yonathan@sbm-itb.ac.id

Abstract– Gili Trawangan is a small island located in north Lombok. Gili Trawangan has a lot of place with beautiful scenery and beach, so it is very potential place for tourism destination. Government is preparing Gili Trawangan to be as famous as Bali. Tourism industry itself had been growing rapidly. Local government plans three big project, those are: building Lombok International Airport, building modern floating dock in Gili Trawangan, and building ring road inside Gili Trawangan. The problem is, infrastructure and supply of clean water are becoming rare commodities. Water is one of the natural resources that control lives of many people. Long time ago, water was one of the natural resources that easily recycled, and clear water was easily to be obtaining everywhere. But nowadays in Gili Trawangan, all ground water has already contaminated by seawater. So, purpose of this project is about producing clean water from seawater and set normal price of clean water. This research describes about list of stakeholders of the project, type of corporation between local government and private company for the project, steps that must be done for realizing this project, kind of technology used in this project, target market, amount of water demand, cost of investment, and financial analysis using cash flow, profit and loss, NPV, IRR, and payback period to find feasibility of project. All data processing is based on collection data from central Biro Pusat Statistik for the population data; and from Ditjen Cipta Karya Dinas Pekerjaan Umum 2006 for water demand calculation. Period of the research is five years that is from 2014 until 2018. Assumption of the initial investment is in 2013.

Keywords: Water Treatment Project, Gili Trawangan, NPV, IRR, Payback Period.

Introduction

Water is one of the natural resources that control the lives of many people. Long time ago, water was one of the natural resources that easily recycled, and clean water was easily to be obtaining everywhere. But, because of advancement of era that are accompanied by the advancement of technology, and also because of the increasing number of population causing the pollution level uncontrollable. The increase of population from years to years led to increasing the demand of clean water. While, on the other side, the supply of clean water are depleting. This causes the water treatment business has good prospects in the future.

In this research, writer uses one of Small Island in Gili. The island of Gili's that located at Lombok Utara District, Nusa Tenggara Barat consist of 3 small island; which is: Gili Trawangan, Gili Meno, and Gili Air. Among those three islands, Gili Trawangan were one of the largest island, to be exact about 340 ha, while Gili Meno is about 150 ha, and Gili Air is about 175 ha. This research will focus to analyze about business opportunity of water treatment in Gili Trawangan. Gili Trawangan is located around 115,460 – 116,280 east longitude and 8,120 – 8,550 south latitude. Gili Trawangan became one of the Indonesia tourism destinations because of the beauty of the white sand beaches and its underwater scenery.

But just like the island of Indonesia in general, the infrastructure and the supply of clean water are always became a rare commodities, or even not available. The water sources at Gili Trawangan at this moment are unfit for important consumption such as cooking and drinking because all of ground water is already contaminated with seawater. So far, most of the clean water demands for residents and visitors of Gili Trawangan were supplied from the mainland of Lombok Island, especially from Pamenang sub-districts by using jerry can. From several reasons above, it is clear that business potential in water treatment will be profitable. This condition will become an opportunity for private company to hold partnership with local government in Gili Trawangan sub-district with 'BKAM (Bangun Kelola dan Alih Milik)' or we usually know it with the BOT (Built – Operate – Transfer) system for 30 years.

Based on the problem identification, this paper intends to answer these questions:

1. Who is the stakeholder of this water treatment project?
2. What type of corporation between local government and private company must be use so household or people in Gili Trawangan can buy clean water?
3. What are the steps that must be done for realizing this water treatment project?
4. What kind of technology will be use to produce clean water?
5. Who is the target market and how much the total demand of clean water?
6. How much fund needed from central and local government to invest in this water treatment project?
7. Based on the calculation of cash flow, profit and loss, NPV, IRR, and payback period, is the project feasible to be done?

Literature Review

A. Stakeholder

Based on Wheelen and Hunger (2013), Stakeholders are a large number of groups with interest in a business organization's activities. These groups affect or are affected by the achievement of the firm's objectives.

Financial primary stakeholders are often divided into several groups. Capital market stakeholders are shareholders and lenders who have directly invested money in the company and want to preserve and increase their wealth. Product market stakeholders are people who benefit directly from the business without necessarily investing money, such as suppliers and some customers. Organizational stakeholders are employees who work for the company and depend on survival for income.

Secondary stakeholders are those not directly impacted by investment, but who experience some sort of change regardless. The entire public of a nation is a secondary stakeholder to most businesses, because these businesses pay taxes those are then used by the government to create benefits for the citizens.

Based on Freeman and Reed (1984), Stakeholders are generally divided into two groups: internal and external stakeholders. As the terms suggest, internal stakeholders come from within the corporation and external stakeholders are those outside the corporation but with a vested interest in it.

B. Type of Corporation between Public and Private Sector

PPP involves a contract between a public sector authority and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project. BOT (build-operate-transfer) is a form of project financing, wherein a private entity receives a concession from the private or public and social sector to finance, design,

construct, and operate a facility stated in the concession contract. This enables the project proponent to recover its investment, operating and maintenance expenses in the project.

Due to the long-term nature of the arrangement, the fees are usually raised during the concession period. The rate of increase is often tied to a combination of internal and external variables, allowing the proponent to reach a satisfactory internal rate of return for its investment.

Based on Bashiri, Ebrahimi, and Fazlal, public private partnership (PPP) describes a government service or private business venture, which is funded and operated through a partnership of government and one or more private sector companies. PPP involves a contract between a public sector authority and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project.

C. Step for Realizing Water Treatment Project

Based on Rinaldi (2011), steps on conducting public private partnership are:

- Planning
- Arranging pre-feasibility study
- Transaction
- Management of cooperation implementation

D. Technology for Water Treatment

Variety of Tools for Water Treatment:

- Mechanical accelerated clarifier
- Multi Media Filter (MMF)
- Self-Cleaning Filter
- UF/MF Membrane (Ultra Filtration/Micro Filtration membrane)
- Cartridge Filter
- RO/NF Membrane
- Disinfection System

E. Target Market

The goal of a market analysis is to determine the attractiveness of a market, both now and in the future. Organizations evaluate the future attractiveness of a market by gaining an understanding of evolving opportunities and threats as they relate to that organization's own strengths and weaknesses.

F. Water Demand

Population calculation has two formulas, those are: calculating percent (straight-line) growth rates and calculating average annual (compound) growth rate. For straight-line, the formula for percent change from one period to another is:

$$PR = \frac{(V_{Present} - V_{Past})}{V_{Past}} \times 100 \quad (1)$$

with: PR = Percent Rate; $V_{Present}$ = Present or Future Value; V_{Past} = Past or Present Value.

The annual percentage growth rate is simply the percent growth divided by N, the number of years. For compound, the formula is:

$$Pop_{Future} = Pop_{Present} \times (1 + i)^n \quad (2)$$

With: Pop_{Future} = Future Population; $Pop_{Present}$ = Present Population; i = Growth Rate
n = Number of Years.

G. Financial Analysis

Payback periods are commonly used to evaluate proposed investments. The payback period is the amount of time required for the firm to recover its initial investment in a project, as calculated from cash inflows. In the case of an annuity, the payback period can be found by dividing the initial investment by the annual cash inflow. For a mixed stream of cash inflows, the yearly cash inflows must be accumulated until the initial investment is recovered.

Payback period is usually expressed in years. Start by calculating Net Cash Flow for each year: Net Cash Flow Year 1 = Cash Inflow Year 1 - Cash Outflow Year 1. Then Cumulative Cash Flow = (Net Cash Flow Year 1 + Net Cash Flow Year 2 + Net Cash Flow Year 3 ... etc.) Accumulate by year until Cumulative Cash Flow is a positive number: that year is the payback year.

Decision criteria: - If the payback period is less than the maximum acceptable payback period, accept the project.

- If the payback period is greater than the maximum acceptable payback period, reject the project.

The method used by most large companies to evaluate investment projects is called net present value (NPV). NPV is a sophisticated capital budgeting technique; found by subtracting a project's initial investment from the present value of its cash inflows discounted at a rate equal to the firm's cost of capital. NPV method discounts the firm's cash flows at the firm's cost of capital. The rate is the minimum return that must be earned on a project to satisfy the firm's investors. Projects with lower returns fail to meet investors' expectations and therefore decrease firm value, and projects with higher returns increase firm value.

The general equation of net present value (NPV) is:

$$\text{NPV} = \text{Present value of cash inflows} - \text{Initial investment}$$

$$\text{NPV} = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} - CF_0 \quad (3)$$

With: CF_t = present value of cash inflows

CF_0 = project's initial investment

r = rate equal to firm's cost of capital

t = time needed

Decision criteria: - If the NPV is greater than \$0, accept the project.

- If the NPV is less than \$0, reject the project.

The internal rate of return is one of the most widely used capital budgeting techniques. The internal rate of return (IRR) is the discount rate that equates the NPV of an investment opportunity with \$0 (because the present value of cash inflow equals the initial investment). It is the rate of return that the firm will earn if it invests in the project and receives the given cash inflows.

The general equation of internal rate of return is:

$$\sum_{t=1}^n \frac{CF_t}{(1+IRR)^t} - CF_0 = 0 \quad (4)$$

Decision criteria: - If the IRR is greater than the cost of capital, accept the project.

- If the IRR is less than the cost of capital, reject the project.

Research Method

Writer does interviewing people such as head of the village and head of the household. Writer gets the exact data about demography of Gili Trawangan people such as social economy, physical. From head of village, writer also can get the data about water condition and find many problems about

clean water supply in Gili Trawangan. Writer also does interviewing several head of households to know the problem about lack of clean water supply directly to the people. This data is used for making the problem identification in the first chapter.

Writer gets the data about list of potential business customers from Tourism Department and Trading Department. This data will be used to calculate financial analysis in the next step.

Writer also needs data about population growth, Gross Domestic Product in 2011, and population in 2011. Writer gets data about these from central Biro Pusat Statistik office. This data will be used for calculating financial analysis in the next step. For water demand, the data is gotten from Ditjen Cipta Karya Dinas Pekerjaan Umum 2006.

Financial analysis needs also the data about price of material, equipment, labor cost, and all other capital investment to find initial investment. Writer gets the data of prices from internet and stores.

Data Analysis

A. List of Stakeholder

Capital market stakeholders are shareholders and lenders who have directly invested money in the company and want to preserve and increase their wealth. So, capital market stakeholders in this project are private company, bank, and government of Lombok Utara. Private company invests money to do survey to make feasibility study and handle legalization to get the project. Private company also invests money in the amount of more than 35% from the value of project. Bank invests 70% from the value of project. Government of Lombok Utara is the owner of the project and will get the business after 30 years.

Product market stakeholders are people who benefit directly from the business without necessarily investing money. In this project, the product market stakeholders are contractor of the construction, supplier of production's equipment, supplier of the materials, and societies of Gili Trawangan. All of suppliers are included in product market stakeholders. Societies of Gili Trawangan are customer of the business. They will get the benefit from the easiness to get clean water for daily consumption and the cheaper one.

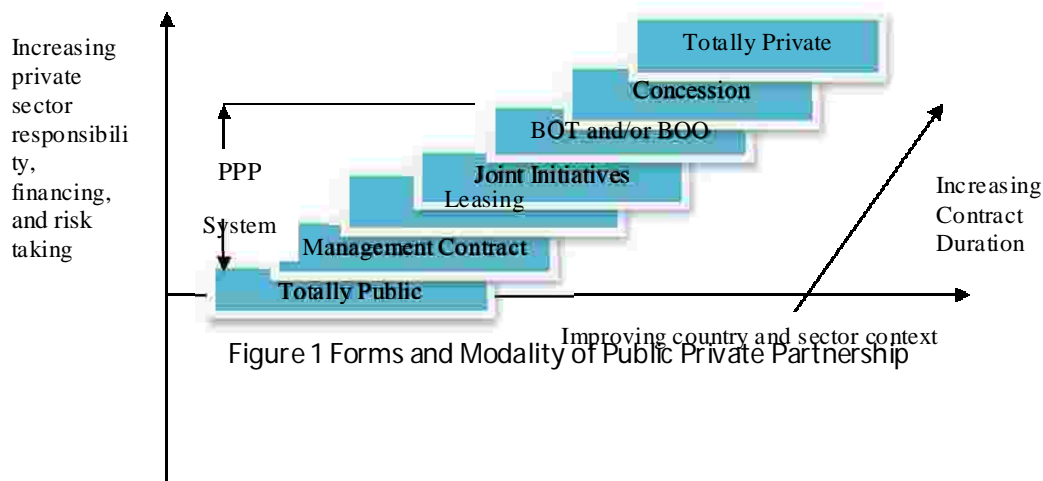
Organizational stakeholders are employees who work for the company and depend on survival for income. All of the employees, management team, board of directors are the organizational stakeholders.

The previous paragraphs tell about primary stakeholder. Primary stakeholders have money invested in the business. Contrary with primary stakeholders, secondary stakeholders are those who are not directly impacted by investment, but who experience some sort of change regardless. In this project, the secondary stakeholders are local house of representative of Lombok Utara and entire public of nation. Local house of representative of Lombok Utara get fund from central house of representative to increase the welfare of people in Lombok Utara. The fund can be use for education, healthiness, etc. The successful on the business can be used for them as the accountability of the fund and good work of the employees in the local house of representative in Lombok Utara. The entire public of nation is a secondary stakeholder to most businesses, because these businesses pay taxes those are then used by the government to create benefits for the citizens.

Based on Freeman and Reed (1984), Stakeholders are generally divided into two groups; internal and external stakeholders. Internal stakeholders come from within the corporation and external stakeholders are those outside the corporation but with a vested interest in it. Based on that, in this project, the internal stakeholders are all of the employees, management team, board of directors,

private company, and government of Lombok Utara. External stakeholders in this project are bank, all suppliers, societies of Gili Trawangan, and local house of representative of Lombok Utara.

B. Type of Corporation between Local Government and Private Sector



Public Private Partnership (PPP) is a mechanism of alternative financing for provision of public services have been used widely in many countries, especially developed countries. PPP enables chances to utilize management ability and expertise of private sector, and also increase additional fund for supporting public services.

Table 1 Allocation of key responsibilities under the main private sector participation

Option	Asset Ownership	Operations and Maintenance	Capital Investment	Commercial Risk	Duration
Service contract	Public	Public and Private	Public	Public	1-2 years
Management contract	Public	Private	Public	Public	3-5 years
Lease	Public	Private	Public	Shared	8-15 years
Concession	Public	Private	Private	Private	25-30 years
Build Operate Transfer	Private and Public	Private	Private	Private	20-30 years

Government have to regulate all public services those are important and crucial. Water is very important, so government must have important role in the regulation. Based on table 4.6, the asset ownership of the project using Build Operate Transfer is both private and public, so government has authority on managing the regulation. Private sector will prefer BOT system because they has asset ownership so they also has authority. Private sector has the biggest risk in this project, so it is better for private sector to has also asset ownership. Therefore, BOT is the best choice for public and private sector.

C. Steps for Realizing Water Treatment Project

Table 2 Steps for Realizing Water Treatment Project

ST EP	PROCESS	PERIOD	RESULT
I	<ol style="list-style-type: none"> 1. Private sector makes a letter to the mayor of Lombok Tengah (Bupati Lombok Tengah). The letter is about willingness on establishing cooperation with the local government that is represented by local water company (PDAM) in Lombok Tengah district. 2. Local government represented by PDAM conducts a meeting with the private sector to discuss about cooperation. 3. The results of this meeting are followed up with a report to the mayor of Lombok Tengah (Bupati Lombok Tengah). After that private sector ask for guidance for the next step. 	2 Month	Letter of Agreement from mayor of Lombok Utara (Bupati Lombok) for doing cooperating with PDAM
II	<ol style="list-style-type: none"> 1. Private sector conduct presentation in front of related agency such as mayor of Lombok Tengah, BAPEDA, General Working Agency, and PDAM. 2. After getting the agreement, the next step is arranging memorandum of understanding of the cooperation between private sector and PDAM. 	2 Month	Memorandum of Understanding between private sector and PDAM
III	<ol style="list-style-type: none"> 1. Arranging Pre-Feasibility Study. 2. Arranging Business Plan and the presentation. 	1 Month	Pre-Feasibility Study
IV	<ol style="list-style-type: none"> 1. Conducting presentation about pre-feasibility study in front of all the stakeholders such as government, Dewan Perwakilan Rakyat Daerah (DPRD), Lembaga Swadaya Masyarakat (LSM), etc. 2. Arranging conclusion and revision based on the result of presentation. 3. Ratification of the presentation. 	1 Month	Ratification of Pre-Feasibility Study
V	<ol style="list-style-type: none"> 1. Arranging Feasibility Study. 2. Conducting presentation in front of mayor of Lombok Tengah (Bupati), PEMDA, and DPRD. 3. Approval and ratification of feasibility study. 	3 Month	Feasibility Study
VI	<ol style="list-style-type: none"> 1. Cooperation contract using Build-Operate-Transfer (BOT) form between private company and PDAM. 	1 Month	BOT cooperation contract for 30 Years
VII	<ol style="list-style-type: none"> 1. Publishment of local regulation (Peraturan Daerah (PERDA)) 	2 Month	PERDA
VIII	<ol style="list-style-type: none"> 1. Construction of the Water Treatment Project 	6 Month	
IX	<ol style="list-style-type: none"> 1. Operational of Water Treatment Project 	18 Month	
X	<ol style="list-style-type: none"> 1. Transfer of the ownership to the PDAM after 30 years 		

D. Technology in Water Treatment Project

Water treatment project for Gili Trawangan uses seawater desalination process. Seawater desalination is one of the best solutions for Gili Trawangan that have limited availability of surface water (ground water, river water, etc.), or in an area very close to the seawater. The technologies used for seawater desalination are Ultra Filtration (UF) and Reverse Osmosis (RO).

E. Demand Analysis

Target markets of water treatment project are people of Gili Trawangan, business sector, and retail market. People of Gili Trawangan consume water for daily needs, Puskesmas facility and mosque facility. Business sectors in this research are hotels and restaurants. Retail market is the target market for consuming of water in gallon. In this research, consumption of water is divided into two categories of market, those are: domestic demand and non-domestic demand. Domestic demand includes household and public hydrant. Non-domestic hydrant includes Puskesmas, mosque, hotel, and restaurant. People of Gili Trawangan use water from domestic and non-domestic category. People use water for household, public hydrant, mosque, and Puskesmas. Business sector uses water from non-domestic category, those are: hotels and restaurants. Retail market uses water in gallon. Retail market can be people of Gili Trawangan or might be business sector.

Using the data and projected population formula, the population of Gili Trawangan in 2014 until 2018 will be:

$$\begin{aligned} 2014 \rightarrow \text{Population in 2014} &= \text{Population in 2010} \times (1 + \text{growth rate})^{\text{period}} \\ &= 1,800 \times (1 + 0.0191)^4 \\ &= 1,800 \times 1.0786 = 1,941.51 \approx 1,942 \text{ people} \end{aligned}$$

$$\begin{aligned} 2015 \rightarrow \text{Population in 2015} &= \text{Population in 2010} \times (1 + \text{growth rate})^{\text{period}} \\ &= 1,800 \times (1 + 0.0191)^5 \\ &= 1,800 \times 1.0992 = 1,978.59 \approx 1,979 \text{ people} \end{aligned}$$

$$\begin{aligned} 2016 \rightarrow \text{Population in 2016} &= \text{Population in 2010} \times (1 + \text{growth rate})^{\text{period}} \\ &= 1,800 \times (1 + 0.0191)^6 \\ &= 1,800 \times 1.1202 = 2,016.38 \approx 2,017 \text{ people} \end{aligned}$$

$$\begin{aligned} 2017 \rightarrow \text{Population in 2017} &= \text{Population in 2010} \times (1 + \text{growth rate})^{\text{period}} \\ &= 1,800 \times (1 + 0.0191)^7 \\ &= 1,800 \times 1.1416 = 2,054.90 \approx 2,055 \text{ people} \end{aligned}$$

$$\begin{aligned} 2018 \rightarrow \text{Population in 2018} &= \text{Population in 2010} \times (1 + \text{growth rate})^{\text{period}} \\ &= 1,800 \times (1 + 0.0191)^8 \\ &= 1,800 \times 1.1634 = 2,094.13 \approx 2,095 \text{ people} \end{aligned}$$

Projected population data will be use for calculating water demand from each category.

Table 3 Water Consumption for Household Connection

N o	Year	Population (people)	Service level (%)	Served population (people)	Average Water Consumption (liter/person/day)	Amount of usage (liter/day)	Amount of usage (m3/day)
[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]
1	2014	1,942	80	1,553.6	150	233,040	233.04
2	2015	1,979	80	1,583.2	150	237,480	237.48
3	2016	2,017	80	1,613.6	150	242,040	242.04
4	2017	2,055	80	1,644	150	246,600	246.6
5	2018	2,095	80	1,676	150	251,400	251.4

Table 4 Water Consumption for Public Hydrant

N o	Year	Population (people)	Service level (%)	Served population (people)	Average Water Consumption (liter/person/day)	Amount of usage (liter/day)	Amount of usage (m3/day)
[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]
1	2014	1,942	20	388.4	37.5	14,565	14.565
2	2015	1,979	20	395.8	37.5	14,842.5	14.8425
3	2016	2,017	20	403.4	37.5	15,127.5	15.1275
4	2017	2,055	20	411	37.5	15,412.5	15.4125
5	2018	2,095	20	419	37.5	15,712.5	15.7125

Table 5 Water Consumption for Puskesmas Facility

No	Year	Quantity (unit)	Average Water Consumption (liter/unit/day)	Amount of usage (liter/day)	Amount of usage (m3/day)
[a]	[b]	[c]	[d]	[e]	[f]
1	2014	1	2,000	2,000	2
2	2015	1	2,000	2,000	2
3	2016	1	2,000	2,000	2
4	2017	1	2,000	2,000	2
5	2018	1	2,000	2,000	2

Table 6 Water Consumption for Mosque Facility

No	Year	Quantity (unit)	Average Water Consumption (liter/unit/day)	Amount of usage (liter/day)	Amount of usage (m3/day)
[a]	[b]	[c]	[d]	[e]	[f]
1	2014	3	3,000	9,000	9
2	2015	3	3,000	9,000	9
3	2016	3	3,000	9,000	9
4	2017	3	3,000	9,000	9
5	2018	3	3,000	9,000	9

The total of water consumption for all hotels in Gili Trawangan for a day is 114.15 m3/day. The total of water consumption for all restaurants in Gili Trawangan for a day is 80 m3/day.

Table 7 Comprehensive Water Consumption in Gili Trawangan Island

Year	Household Connection (m3/day)	Public Hydrant (m3/day)	Puskesmas (m3/day)	Mosque (m3/day)	Hotel (m3/day)	Restaurant (m3/day)	Total water demand (m3/day)
[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]
2014	233.04	14.565	2	9	114.15	80	452.76
2015	237.48	14.8425	2	9	114.15	80	457.47
2016	242.04	15.1275	2	9	114.15	80	462.32
2017	246.6	15.4125	2	9	114.15	80	467.16
2018	251.4	15.7125	2	9	114.15	80	472.26

After finding the value of total water demand for Gili Trawangan Island in one day, the next step is adding water loss aspect to find real water needed in Gili Trawangan Island. Government set the water loss percentage from total demand through Ditjen Cipta Karya Dinas PU 2006, that is 20%-30% for all city category. But, in this research, water loss percentage from total demand is 5%.

Table 8 Total Water Demand After Calculating Water Loss

Year	Total water demand (m3/day)	Water loss (%)	Water loss (m3/day)	Real water demand (m3/day)
[a]	[b]	[c]	[d]	[e]
2014	452.76	5	22.63775	475.39
2015	457.47	5	22.873625	480.35
2016	462.32	5	23.115875	485.43
2017	467.16	5	23.358125	490.52
2018	472.26	5	23.613125	495.88

F. Investment Cost

Total fund needed is IDR 9,775,823,300,00. Total cost of investment is sum from total fund needed plus pre-operational cost plus cost of 1,200 m² area of land. Pre-operational cost is IDR 300,000,000. Cost of 1,200 m² area of land is IDR 120,000,000. So, cost of investment is IDR 10,195,823,300.

G. Financial Analysis

Based on real water demand, capacity of the production for a day will be 500 m³/day. But the real output from the production will not be the as same as the capacity. The assumption is there is 2% water loss during production process, that is 10 m³/day. So, the real production output is 490 m³/day.

Income is divided into two sources. First is from sales of water.

Sales of clean water will be divided into three categories based on price, they are domestic, non-domestic, and retail market. Domestic sector includes household connection only. Public Hydrant is for fire brigade, so it is free for public convenience. Non-domestic includes Puskesmas, three mosque, hotels, and middle-up restaurants. Retail market uses water in gallon. Retail market can be people of Gili Trawangan (household) or might be business sector (hotels and restaurants). Price of water for domestic in Gili Trawangan is IDR 25,000/m³. Price of water for non domestic is IDR 30,000/m³. And price of water for retail market is IDR 5,000/gallon. One gallon consists of 19 liters drinking water. Every year there will be price mark-up about 7%.

Table 9 Sales Revenue from Selling Water to Domestic

Year	Water demand (m3/day)	Inflation (%)	Price (IDR)	Sales revenue (IDR)
[a]	[b]	[c]	[d]	[e]
2014	244.692	-	25,000	2,232,814,500
2015	249.354	7	25,000	2,434,630,118
2016	254.142	7	25,000	2,655,075,479
2017	258.93	7	25,000	2,894,453,504
2018	263.97	7	25,000	3,157,348,758
TOTAL				13,374,322,358

Table 10 Sales Revenue from Selling Water to Non-Domestic

Year	Water demand (m3/day)	Inflation (%)	Price (IDR)	Sales revenue (IDR)
[a]	[b]	[c]	[d]	[e]
2014	215	-	30,000	2,354,250,000
2015	215	7	30,000	2,519,047,500
2016	215	7	30,000	2,695,380,825
2017	215	7	30,000	2,884,057,483
2018	215	7	30,000	3,085,941,507
TOTAL				13,538,677,314

Table 11 Sales Revenue from Selling Water to Retail Market

Year	Water demand (gallon/year)	Inflation (%)	Price (IDR)	Sales revenue (IDR)
[a]	[b]	[c]	[d]	[e]
2014	553,121	-	5,000	2,765,605,000
2015	468,040	7	5,000	2,504,011,325
2016	380,659	7	5,000	2,179,079,583
2017	293,278	7	5,000	1,796,387,742
2018	201,298	7	5,000	1,319,299,799
TOTAL				10,564,383,450

Non-sales revenue is revenue out from sales but from installation of new connection. For domestic category, price of new connection is IDR 1,000,000 / unit. For non-domestic category, price of new connection is IDR 2,000,000 / unit.

Table 12 Non-sales Revenue from Installing New Connection for Domestic Category

Year	Number of new connection (unit)	Price per unit (IDR)	Inflation (%)	Non-sales revenue (IDR)
[a]	[b]	[c]	[d]	[e]
2014	311	1,000,000	-	310,800,000
2015	6	1,000,000	7	6,206,000
2016	6	1,000,000	7	6,869,400
2017	6	1,000,000	7	7,350,258
2018	6	1,000,000	7	7,864,776
TOTAL				339,090,434

Table 13 Non-sales Revenue from Installing New Connection for Non-domestic Category

Year	Number of new connection (unit)	Price per unit (IDR)	Inflation (%)	Non-sales revenue (IDR)
[a]	[b]	[c]	[d]	[e]
2014	81	2,000,000	-	162,000,000
2015	0	2,000,000	7	0
2016	0	2,000,000	7	0
2017	0	2,000,000	7	0
2018	0	2,000,000	7	0
TOTAL				162,000,000

Total revenue is total revenue from the combination of sales revenue and non-sales revenue. For sales revenue, there are three categories such as domestic, non-domestic, and retail market. For non-sales revenue, there are two categories such as domestic and non-domestic. Here is the calculation of total revenue:

Table 14 Total Revenue from 2014 until 2018

		Year				
		2014	2015	2016	2017	2018
Sales Revenue (IDR)	Domestic	2,232,814,500	2,434,630,118	2,655,075,479	2,894,453,504	3,157,348,758
	Non-domestic	2,354,250,000	2,519,047,500	2,695,380,825	2,884,057,483	3,085,941,507
	Retail market	2,765,605,000	2,504,011,325	2,179,079,583	1,796,387,742	1,319,299,799
Non Sales Revenue (IDR)	Domestic	310,800,000	6,206,000	6,869,400	7,350,258	7,864,776
	Non-domestic	162,000,000	0	0	0	0
Total revenue (IDR)		7,825,469,500	7,463,894,943	7,536,405,287	7,582,248,987	7,570,454,839

Above is total revenue from 2014 until 2018. To know about profitability of the project, here is projected total cost:

Operational cost is costs associated with the production process. There are several costs included in operational cost in this research, those are: cost of production, bank interest, depreciation, water retribution to local government, and cost of new connection. There are two types of cost: operational and non-operational. Non-operational cost is costs that is not associated with the production process, but for management. There are several costs included in non-operational cost in this research, those are: general manager salary, administrative salary, office expenses, and overhead cost. Total cost is combination from operational cost and non-operational cost. Here is the calculation for total cost:

Table 15 Total Cost from 2014 until 2018

	Year				
	2014	2015	2016	2017	2018
Operational Cost (IDR)	2,996,226,879	2,331,943,504	1,823,809,513	1,894,608,342	1,968,947,113
Non-operational Cost (IDR)	352,000,000	368,240,000	385,616,800	404,209,976	424,104,674
Total Cost (IDR)	3,348,226,879	2,700,183,504	2,209,426,313	2,298,818,318	2,393,051,787

After calculating total revenue and total cost, next step is creating income statement to see if it profit or loss.

Table 16 Income Statement Projection from 2014 until 2018

	Year				
	2014	2015	2016	2017	2018
Total revenue	7,825,469,500	7,463,894,943	7,536,405,287	7,582,248,987	7,570,454,839
Cost of Production (per m3)	(1,244,832,500)	(1,307,074,125)	(1,372,427,831)	(1,441,049,223)	(1,513,101,684)
Water retribution to local government (per m3)	(36,500,000)	(38,325,000)	(40,241,250)	(42,253,313)	(44,365,978)
Cost of new connection					
Domestic	(155,500,000)	(3,150,000)	(3,307,500)	(3,472,875)	(3,646,519)
Non-domestic	(81,000,000)	0	0	0	0
General Manager Salary	(120,000,000)	(128,400,000)	(137,388,000)	(147,005,160)	(157,295,521)
Administrative Salary	(52,000,000)	(55,640,000)	(59,534,800)	(63,702,236)	(68,161,393)
Office expense	(60,000,000)	(64,200,000)	(68,694,000)	(73,502,580)	(78,647,761)
Overhead	(120,000,000)	(120,000,000)	(120,000,000)	(120,000,000)	(120,000,000)

cost)))))
Depreciation	(407,832,932)	(407,832,932)	(407,832,932)	(407,832,932)	(407,832,932)
Operating profit (EBIT)	5,547,804,068	5,339,272,886	5,326,978,974	5,283,430,668	5,177,403,051
Interest expense (15%)	(1,070,561,447)	(575,561,447)	0	0	0
Taxable income	4,477,242,621	4,763,711,439	5,326,978,974	5,283,430,668	5,177,403,051
Tax (25%)	(1,119,310,655)	(1,190,927,860)	(1,331,744,744)	(1,320,857,667)	(1,294,350,763)
Net Income	3,357,931,966	3,572,783,579	3,995,234,231	3,962,573,001	3,883,052,288
Net profit margin	42.91%	47.87%	53.01%	52.26%	51.29%

Based on the table, this project has profit for five years research period.

Based on income analysis and cost analysis, here is the cash flow budget from 2013 until 2018:

Table 17 Cash Flow Budget from 2013 until 2018

		Year					
		2013	2014	2015	2016	2017	2018
Cash Inflow							
Equity [a]		3,500,000,000					
Bank Loan [b]		7,137,076,310					
Income From Operational [c]			3,357,931,966	3,572,783,579	3,995,234,231	3,962,573,001	3,883,052,288
Add back Depreciation [d]			407,832,932	407,832,932	407,832,932	407,832,932	407,832,932
Total Cash Inflow		10,637,076,310	3,765,764,898	3,980,616,511	4,403,067,163	4,370,405,933	4,290,885,220
Cash Outflow							
Cost of Investment [e]		10,195,823,300					
Initial Working Capital [f]			735,098,487				
Loan Payment [g]			3,300,000,000	3,837,076,310			
Total Cash Outflow		10,195,823,300	4,035,098,487	3,837,076,310	-	-	-
Net Cash Flow		441,253,010	(269,333,589)	143,540,201	4,403,067,163	4,370,405,933	4,290,885,220
Cumulative Net Cash Flow		441,253,010	171,919,421	315,459,622	4,718,526,785	9,088,932,718	13,379,817,938

The general equation of net present value (NPV) is:

$$NPV = \text{Present value of cash inflows} - \text{Initial investment}$$

Based on the equation, here is the calculation of NPV of the project:

Cash inflow in 2014 = IDR 3,765,764,898

Cash inflow in 2015 = IDR 3,980,616,511

Cash inflow in 2016 = IDR 4,403,067,163

Cash inflow in 2017 = IDR 4,370,405,933

Cash inflow in 2018 = IDR 4,290,885,220

Initial investment in 2013 = IDR 10,195,823,300.

$r = 15\%$

$NPV = \text{PV cash inflow in 2014} + \text{PV cash inflow in 2015} + \text{PV cash inflow in 2016} + \text{PV cash inflow in 2017} + \text{PV cash inflow in 2018} - \text{initial investment}$

$$= \frac{3,765,764,898}{(1+0.15)^1} + \frac{3,980,616,511}{(1+0.15)^2} + \frac{4,403,067,163}{(1+0.15)^3} + \frac{4,370,405,933}{(1+0.15)^4} + \frac{4,290,885,220}{(1+0.15)^5} - 10,195,823,300$$

$$= \text{IDR } 3274578172 + \text{IDR } 3009917967 + \text{IDR } 2895088132 + \text{IDR } 2498793777 + \text{IDR } 2133328305 - \text{IDR } 10,195,823,300$$

$$= \text{IDR } 3,615,883,053$$

Net Present Value of the project is IDR 3,615,883,053. NPV is greater than IDR 0, so the project is acceptable.

The general equation of internal rate of return is:

$$0 = \frac{CF_1}{(1+IRR)^1} + \frac{CF_2}{(1+IRR)^2} + \frac{CF_3}{(1+IRR)^3} + \frac{CF_4}{(1+IRR)^4} + \frac{CF_5}{(1+IRR)^5} - \text{Initial Investment}$$

Based on the equation, the IRR of the project is 28.7344%. Cost of capital for this project is 15%. So, IRR is greater than the cost of capital, the project is acceptable.

Payback period is the time in which the initial cash outflow of an investment is expected to recover from the cash inflows generated by the investment. Below is table about initial cash outflow and cash inflows from 2014 until 2018:

Table 18 Cash Flow for Payback Period

Year	Cash Flow (IDR)
2013	(10,195,823,300)
2014	3,765,764,898
2015	3,980,616,511
2016	4,403,067,163
2017	4,370,405,933
2018	4,290,885,220

Initial investment for this project is IDR 10,195,823,300. Based on table above, cash flow in 2013 shows the initial investment for the project. Cash flow from 2014 until 2018 shows annual cash inflow from year 2014 until 2018. Cumulative cash flow is the incremental cash inflow from year to year. So the payback period will be:

$$\text{Payback period} = 2 + \frac{2,449,441,891}{4,403,067,163} = 2.56 \text{ year} = 2 \text{ years } 6 \text{ months and } 22 \text{ days}$$

Target payback period from private sector is 5 years. Payback period for the project is 2 years 6 months and 22 days. So, this project is acceptable because payback period is less than the target payback period.

Based on analysis of NPV, IRR, and payback period, this project is acceptable. So, based on this research, this project is feasible.

Conclusion and Recommendation

Based on the previous chapter, the conclusion for Case Analysis of Developing Water Treatment Project in Gili Trawangan, North Lombok are:

1. The stakeholder of this water treatment project are private company, bank, government of Lombok Utara, contractor of the construction, supplier of production's equipment, supplier of the materials, societies of Gili Trawangan, employees, management team, board of directors are the organizational stakeholders, local house of representative of Lombok Utara and entire public of nation.
2. Type of corporation between local government and private company must be Build Operate Transfer (BOT) system for 30 years.
3. Steps that must be done for realizing this water treatment project are: getting letter of agreement from mayor of Lombok Utara (Bupati Lombok) for doing cooperating with PDAM; getting memorandum of understanding between private sector and PDAM; making pre-feasibility study; doing ratification of pre-feasibility study; making feasibility study; assigning BOT cooperation contract for 30 years; waiting for publishment of local regulation (Peraturan Daerah (PERDA)); constructing the water treatment project; operating water treatment project; transferring the ownership to the PDAM after 30 years.
4. Kind of technology will be use to produce clean water is Ultra Filtration (UF) and Reverse Osmosis (RO) for doing seawater desalination process.
5. The target markets are people of Gili Trawangan, business sector, and retail market. People of Gili Trawangan consume water for daily needs, Puskesmas facility and mosque facility. Business sectors in this research are hotels and restaurants. Retail market is the target market for consuming of water in gallon. And the total demand of clean water in 2014 is 475.39 m³/day; in 2015 is 480.35 m³/day; in 2016 is 485.43 m³/day; in 2017 is 490.52 m³/day; and in 2018 is 495.88 m³/day.
6. Fund needed from central and local government to invest in this water treatment project is IDR 10,195,823,300.
7. Based on the calculation of cash flow, profit and loss, NPV, IRR, and payback period, the project is feasible to be done. Net Present Value of the project is IDR 3,615,883,053. IRR of the project is 28.7344% above cost of capital, that is 15%. Payback period for the project is 2 years 6 months and 22 days. Target of payback period is 5 years.

Based on the previous chapter, the recommendation for Case Analysis of Developing Water Treatment Project in Gili Trawangan, North Lombok are:

1. Local government helps private company to assist land acquisition.
2. Local government helps private company by speeding up all licenses to build water treatment plan.
3. Local government and local house of representative set local regulation for water price and increasing price every year based on inflation.
4. Local government does socialization to people Gili Trawangan about new water treatment project in Gili Trawangan.
5. Implementing more financial analysis tools such as ROE and ROA to make feasibility decision.

Reference

- Gitman, Lawrence J.; Zutter, Chad J., 2012. Principles of Managerial Finance. 13th ed. England : Pearson.
- Kotler, Phil; Keller, Kevin, 2008, Marketing Management. 13th ed. New Jersey : Pearson.
- Porter, Michael E., 1985, Competitive Advantage: Creating and Sustaining Superior Performance. New York : The Free Press.
- Sanchez, Ron; Heene, Aime, 2003, The New Strategic Management: Organization, Competition, and Competence. 8th ed. Netherlands : Elsevier.
- Wheelen, Thomas L.; Hunger, J. David, 2013. Strategic Management and Business Policy. 12th ed. England : Pearson.
- Wheelen, Thomas L.; Hunger, J. David, 2013. Strategic Management and Business Policy. 13th ed. England : Pearson.
- Aid for development effectiveness secretariat, 2012, Kerjasama Pemerintah Swasta (KPS) Pembiayaan KPS Infrastruktur dan Kesesuaiannya pada KPS Sosial, retrieved on January 24, 2013 from http://a4des.org/documents/KERJASAMA_PEMERINTAH_SWASTA-KPS.pdf?q=&min_filesize=&max_filesize=&max_age=&max_age=&recursive=0&filetype=&_action=view&valid=data&dir=%2Fsites%2Fa4des.org%2Fwww%2Fdocuments&file=KERJASAMA_PEMERINTAH_SWASTA-KPS.pdf.
- Anastaziah, Isnurani, 2006, Persepsi Wisatawan Manacanegara terhadap Atraksi Pariwisata Air di Kawasan Gili Trawangan, Universitas Diponegoro Semarang, retrieved on November 11, 2012 from <http://eprints.undip.ac.id/4301/1/isnuraniTA.pdf>.
- Bashiri, Marjan; Ebrahimi, Shabnam; Fazlali, Maryam; Hosseini, Seyed Jamshid; Jamal, Narges; Salehvand, Parviz; Analytical Comparison between BOT, BOOT, and PPP Project Delivery System, 6th International Project Management Conference, retrieved on January 24, 2013 from <http://www.mbaforum.ir/download/mba/pm/6th/322.pdf>.
- Forum Economic Ministers Meeting, 2006, Public Private Partnerships and Build, Operate and Transfer (BOT) and suchlike Schemes, Pacific Islands Forum Secretariat, retrieved on January 26, 2013 from <http://www.forumsec.org.fj/resources/uploads/attachments/documents/FEMM%202006%20Private%20Public%20Partnerships%20and%20BOT%20Schemes.pdf>.
- Nurchayono, Nurchayono; Putra, Titus Diana, 2008, Perencanaan Pemenuhan Air Baku di Kecamatan Gunem Kabupaten Rembang, Universitas Diponogoro, retrieved on http://eprints.undip.ac.id/34051/8/1915_CHAPTER_V.pdf.
- Rinaldi, M. Taufik, 2011, Identifikasi dan Seleksi Proyek Kerjasama, Sustaining Partnership Magazine, edisi khusus tahapan KPS 2011, retrieved on April 15, 2013 from http://pkps.bappenas.go.id/attachments/article/955/NOVEMBER%20Khusus_TAHAPAN%20KPS_INDONESIA_L.pdf.
- Rinaldi, M. Taufik, 2011, Pra-Studi Kelayakan, Sustaining Partnership Magazine, edisi khusus tahapan KPS 2011, retrieved on April 15, 2013 from http://pkps.bappenas.go.id/attachments/article/955/NOVEMBER%20Khusus_TAHAPAN%20KPS_INDONESIA_L.pdf.
- Freeman, R. Edward, Reed, David L. Stockholders and Stakeholders: A new perspective on Corporate Governance, California Management Review, volume 25 issue 3: 88-106.
- Post, James. 2002, Redefining the Corporation: Stakeholder Management and Organizational Wealth, Stanford University Press.
- Yulianto, Gatot, Fahrudin, Ahmad & Kusmaningsih, Nellyana. 2007, Analisis Permintaan Rekreasi dan Strategi Pengembangan Wisata Bahari Gili Trawangan Kabupaten Lombok Barat Provinsi Nusa Tenggara Barat, Buletin Ekonomi Perikanan, volume 7 issue 2: 82-83.
- Answer.com, 2012, Water Treatment, retrieved on November 11, 2012 from <http://www.answers.com/topic/water-treatment>.

- Biro Pusat Statistik, 2008, Analisis dan Penghitungan Tingkat Kemiskinan 2008, retrieved on November 11, 2012 from <http://daps.bps.go.id/File%20Pub/Analisis%20Kemiskinan%202008.pdf>.
- Businessdictionary.com, 2012, Water Treatment, retrieved on November 11, 2012 from <http://www.businessdictionary.com/definition/water-treatment.html>.
- Harlianzah, 2012, Gili Trawangan Segera Miliki Jalan Lingkar, retrieved on November 11, 2012 from <http://www.republika.co.id/berita/nasional/daerah/12/11/08/md6fv8-gili-trawangan-segera-miliki-jalan-lingkar>.
- Investopedia.com, 2012, Gross Domestic Product – GDP, retrieved on November 11, 2012 from <http://www.investopedia.com/terms/g/gdp.asp#axzz2C0Ywzual>.
- Investopedia.com, 2012, Per Capita GDP, retrieved on November 11, 2012 from <http://www.investopedia.com/terms/p/per-capita-gdp.asp#axzz2C0Ywzual>.
- Lacoma, Tyler, 2013, Definition of Primary Stakeholders, retrieved on April 10, 2013 from http://www.ehow.com/about_6455864_definition-primary-stakeholders.html.
- Michail, Anthony, 2011, Use of Porter's (1985) Value Chain Framework, retrieved on April 11, 2013 from <http://strategy-models.blogspot.com/2011/06/use-of-porters-1985-value-chain.html>.
- Pengembangan Pemerintah dan Swasta, 2012, Badan Perencanaan Pengembangan Nasional, retrieved on January 24, 2013 from <http://pkps.bappenas.go.id/>.
- Rao, Narayana, 2011, Scanning of Environment for Marketing Ideas and Decisions, retrieved on April 19, 2013 from <http://nraomtr.blogspot.com/2011/11/scanning-of-environment-for-marketing.html>.
- Saha, Avijit, 2011, Mapping of Porter's value chain activities into business functional units, retrieved on April 10, 2013 from <http://www.managementexchange.com/hack/mapping-porter's-value-chain-activities-business-functional-units>.
- Supratiwi, Fitri, 2012, Kemenhub Bangun Dermaga Apung di Tiga Gili, retrieved on October 18, 2012 from <http://www.antaraneews.com/berita/339228/kemenhub-bangun-dermaga-apung-di-tiga-gili>.
- Wikipedia.org, 2012, Build-Operate-Transfer, retrieved on November 22, 2012 from <http://en.wikipedia.org/wiki/Build-operate-transfer>.
- Wikipedia.org, 2012, Gross Domestic Product, retrieved on November 11, 2012 from http://en.wikipedia.org/wiki/Gross_domestic_product.
- Wikipedia.org, 2012, Payback Period, retrieved on November 20, 2012 from http://en.wikipedia.org/wiki/Payback_period.
- Wikipedia.org, 2012, Project Financing, retrieved on November 21, 2012 from http://en.wikipedia.org/wiki/Project_finance.