

Installation of solar power system construction essay



**ASSIGN
BUSTER**

Moshi Urban Water Supply and Sanitation Authority is currently operating three boreholes which depend on electric power from TANESCO to operate the submersible water pumps. Moreover the Authority has plans to explore more boreholes to supplement the diminishing surface water abstraction capacity.

The use of electric power from TANESCO has two major constraints to the Authority which are high tariffs and erratic power supply. Due to high tariffs, the cost of running the boreholes has become higher than the revenue received from selling of the abstracted water. Also, due to erratic power supply the population served by boreholes faces irregular water supply.

According to MUWSA's 2011/2012 annual report data, electricity cost for running the boreholes was while the revenue realised in selling the produced water was this shows that, the running costs are higher than revenue by%. Because the Authority has plans to explore more boreholes, the electricity costs may trend hampers the sustainability of the Authority.

The overall objective of this project is to implement the solar energy power system as an alternative source of power that will cut down the costs of operating the boreholes. The solar power systems will be installed at every borehole and the electricity from TANESCO will remain at borehole stations as a backup power.

This project is intended to facilitate cost-effective water production and ensuring steady supply of water to the customers served through boreholes.

The project will install solar energy power systems into three boreholes, and it is expected to reduce the boreholes operation costs by%.

This project is expected to cost.....TZS and will be implemented for the period of years.

LIST OF ABBREVIATION

TANESCO: Tanzania Electric Supply Company

LIST OF FIGURES & TABLES

Figure 1: Network analysis Model.....	6
Figure 2: Work breakdown structure.....	7
Fig 3: Organisation breakdown structure.....	8
Figure 4: Organisation structure of Summy Company.....	12
Table 1: Responsibility Matrix.....	10
Table 2: project scheduling.....	14
Table 3: Gantt chart.....	15
Table 4: Project budget.....	17
Table 5: Risk ranking.....	19
Table 6: Critically matrix.....	19

TABLE OF CONTENTS

EXECUTIVE SUMMARY iv

LIST OF ABBREVIATION v

LIST OF FIGURES & TABLES vi

BASIC DATA SUMMARY 1

2. 0 PROJECT CHARTER AND STAKEHOLDER MAP 2

WORK AND ORGANISATION BREAK DOWN STRUCTURE 7

4. 1 Social appraisal 11

4. 2 Political appraisal 11

4. 3 Technical appraisal 11

4. 4 Environmental appraisal 11

4. 5 Economical and financial appraisal 11

4. 6 Sustainability and risks appraisal 11

PROJECT IMPLEMENTATION PLAN 12

5. 1 Management arrangement 12

5. 2 Monitoring and Evaluation 12

5. 2. 1Monitoring 13

5. 2. 2 Evaluation 13

5. 3 Quality Management 13

5. 4 Project Timing and scheduling 13

5. 5 Project Gantt chart 14

5. 6 Project Budgeting 16

6. 1 Risk Identification 18

6. 2 Risk Probability 18

6. 3 Criticality Matrix 19

Risk Urgency assessment 19

Table 7: Risk Urgency assessment 20

CONCLUSION 21

REFERENCE 23

BASIC DATA SUMMARY

1. 1 Project Name: Installation of Solar Energy System at MUWSA Boreholes

1. 2 Organization Name: Moshi Urban Water Supply and Sanitation Authority

1. 3 Location: Tanzania, East Africa.

1. 4 Implementer: Moshi Urban Water Supply and Sanitation Authority

Address: P. O. Box 1001

Telephone/Fax Tel: +255 (027) 51164. Fax: +255 027 54256

1. 5 Contact Person Mr . Tumaini Sadikieli Marandu

Position /Title: Project Manager

Phone Number: 0754 319 497

1. 6 Project Duration:

1. 7 Total Project Cost: TSH.

1. 8 Proposed Start Date: Soon after receiving Fund

1. 9 Project Beneficiaries: MUWSA andcustomers served with boreholes.

2. 0 PROJECT CHARTER AND STAKEHOLDER MAP

2. 1 Project background and rationale.

Moshi Urban Water Supply and Sanitation Authority was established by Waterworks Act CAP 272 charged with the responsibility of providing water supply and sewerage services in Moshi Municipality, Kilimanjaro region. It was first established in 1994 as autonomous commercial oriented water department, supervised by an Advisory Board as an outcome of implementation of the National Water Policy of 1991.

In July 1998 MUWSA became an autonomous Authority with full operational, managerial and financial powers in accordance with Water Act No. 8 of 1997. However, currently MUWSA operates in accordance with Water Supply and Sanitation Act No. 12 of 2009. The Authority operates as category “ A” and

thus finances all its operational costs and part of capital investments, leaving the obligation of major capital investments to the Government.

MUWSA has an average water production of 25, 500m/day, which comes from natural underground aquifers through springs and boreholes before being transported through 18. 4km of water transmission mains and distributed in a network having a length of 249 km. Springs contributes % of water produced while boreholes contribute%. Springs uses gravity supply system while boreholes use electric pumps.

Since MUWSA finances all its operational costs, electricity is the cost centre that has been rising annually. The electricity bill has risen from TZSin 2011/2012 annual budget to TZS in 2012/2013. Also production from boreholes has dropped fromm³/day in financial year 2010/2011 to m³/day in 2011/2012 due to intermittent power supply.

For those reasons MUWSA intends to install solar energy power systems into existing three boreholes for the aim of reducing the boreholes operation costs by% and ensuring steady supply of water to the customers served through boreholes.

2. 2 Project Description

2. 2. 1 Project Title: Installation of Solar Power Systems to the three Boreholes at Moshi Urban Water Supply and Sanitation Authority.

2. 2. 2 Project Goal: Improved water supply services at areas served by boreholes by installation of new solar power systems.

2. 2. 3 Project Overall Objective:

2. 2. 3. 1 To increase water supply hours in areas served by boreholes from an average of 12 hours to 24 hours per day by June 2015.

Water supply services in areas served by boreholes are compromised by the intermittent power supply from TANESCO. To overcome this problem MUWSA plans to install solar power systems to the currently owned three boreholes as an alternative power solution which is reliable and cost-effective.

Strategies:

Collaborate with Ministry of Water and Development partners for funding the project.

Composing a project team with members having relevant skills on project management and installations of solar power energy systems.

Involvement of MUWSA management and the technical staffs on various stages of project implementation.

2. 2. 4 Project Output

The outcome of this project is to have 24 hours water supply services in areas served by boreholes.

Client's Reasonable Expectations:

The successful completion of this project will give the following benefits:

Supply of water for 24 hours especially to customers who are served by boreholes which will consequently improve their satisfaction.

MUWSA will raise more revenue from water sales.

The use of solar power which is of lower cost than power from TANESCO will cut down costs of operating the boreholes.

Project Activities:

This project will consist of the following activities.

Submit the project proposal to the Ministry of Water and Development partners.

Prepare project design and tender documents

Procure contractor for project implementation.

Site survey and clearance

Lay foundation for electrical fittings house

Brickworks, Roofing, and carpentry works of electrical fittings house.

Lay foundation for solar panels fixing base

Fix solar panels and electrical equipments.

Electrical voltage tests

Connecting power to the water pumps

Water pump tests

Handover the project.

2. 2. 7 Stakeholders Analysis

This project will involve various people who have an interest on it.

Customers who are served by boreholes

Management of Moshi Urban Water Supply And Sewerage Authority

Ministry of Water

Development partners

Local and Regional administrations

Politicians

Project team

2. 2. 8 Project Logical Framework

uhdsfuhd

2. 2. 7 Cost of the Project: 2, 250, 000, 000/= (See attached budget)

2. 2. 8 Duration of Project:

The completion of this project will be after five years. After completion the final evaluations will be conducted at the end of year five extensively to review the whole project so as it will sustainable for long run.

2. 2. 10 Project strategy

This project needs strategies which will facilitate the project to achieve its project goal and objectives. Such strategies are;

To use a project team which consists of members who are expertise in construction of building and are very committed to the work.

To involve TPSC management and students who will use that hostel in stakeholder analysis

2. 2. 12 Logical frame Work see annex.

WORK AND ORGANISATION BREAK DOWN STRUCTURE

This section deals with work and organisation breakdown structure, network analysis and responsibility matrix of the project.

3. 1 Network Analysis Model for year one . Critical Path Method (CPM)

0 0 0

START

0 1 1

A

0 0 1

1 35 36

B

1 0 36

1 30 41

C

6 5 36

36 70 106

D

36 0 106

106 60 166

E

106 0 166

166 100 266

F

166 0 266

366

FINISH

366

266 20 286

H

351 80 371

266 100 366

G

266 0 366

Critical path and milestone is START -A -B -D -E -F -G - FINISH Figure 1:

Network analysis Model

3. 2 WORK BREAKDOWN STRUCTURE

Construction of hostel

Sub Structure

Structure

Finishing

Visit site

Prepare Land

Design House Plan

Lay Foundation

Brickwork to all floors

Roof carpentry

Fix windows and doors

Install Electricity

Painting

Install toilet & bathroom

Plumping pipe work

Brickwork to floor 1

Brickwork to floor 2

Brickwork to floor 3

Brickwork to floor 4

Figure 2: Work breakdown structure

3. 3 Organisation breakdown structure (project organisation structure)

Project Manager

Engineers

Plumbers

Carpenters

Decorators

Builder

Designer

Fig 3: Organisation breakdown structure

3. 4 Responsibility matrixes

OBS Name

WBS Task

Project Manager

Designer

Builder

Engineers

Plumber

Carpenter

Decorator

Visit site

A

R

R

Design House Plan

R

A

R

Prepare Land

R

A

Lay Foundation

R

A

Brickwork to all floors

R

A

Roof carpentry

R

R

A

Fix windows and doors

R

A

Install Electricity

R

A

Painting

R

A

Plumping pipe work

R

A

Table 1: Responsibility Matrix

A: Means accountable person

R: means responsible person

PROJECT APPRAISAL

This section will assess the practicability of the project. It will give the accurate analysis of the project economically, socially, politically and environmentally. Appraisal show whether the project is technically sounds, financially justified and if have benefit or negative impact to the society and government as whole.

4. 1 Social appraisal

This project will have high impact to the target group (Students of TPSC) and society at large. This project will help many students to stay within the campus at low cost ie. Tsh. 200, 000/= per semester. Society living around the college will benefit by selling goods and services to students.

4. 2 Political appraisal

This project is compatible with government policy. This is because one of the goals in Tanzania government policy is to provide quality education.

4. 3 Technical appraisal

The project will use technology which is familiar to our experts. There is no need of requesting foreign consultancy outside the country. Although in terms material resources there is need of requesting some resource material from abroad.

4. 4 Environmental appraisal

This project will not affect the environment. This project will protect environment because trees will be planted across the building and roads. Those trees will protect land and keep good atmosphere.

4. 5 Economical and financial appraisal

This project will increase national income and will be a source of temporary employment to 100 peoples in Tabora region. This project will generate an approximated of

Tsh. 2, 000, 000, 000 after 5 years. See income statements under budget.

4. 6 Sustainability and risks appraisal

Sustainability of this project is high. This project will be sustainable from implementation and after being completed. Although there are some risk which will have impact to the project success. Such risk includes delay of fund, bad weather, key employee will not present when needed and currency inflation which can cause price of material to rise up.

PROJECT IMPLEMENTATION PLAN

This part gives short explanations about Management arrangement, Budgeting, Monitoring and evaluation and Quality management of the project.

5. 1 Management arrangement

Organisation structure is among components in organisation which affect performance within organization Operations. Summy Company is the company which is operate well due to good organisation structure.

Below is the organisation structure of Summy Company which implement this project.

C. E. O

Human Resource Manager

Procurement manager

Finance manager

IT manager

Project manager

Heads of department in project

Figure 4: Organisation structure of Summy Company

5. 2 Monitoring and Evaluation

Monitoring and Evaluation is very important in any project implementation. This is because in project, monitoring and evaluation enables to know the progress of the project, if money and resources are used according to the plan, to resolve conflict among project staffs, to check the quality of the product or service provided as well as to assess whether the project meets the stakeholder needs or not.

5. 2. 1Monitoring

This project will be monitored daily by project manager and other project team members who will be formulated by project manager. This process will be done every day in order to check if the project activities are done effectively and correct according to the stakeholder needs and to resolve conflict among project team

5. 2. 2 Evaluation

Evaluation of this project will be done annually at three levels. Level one will include the project implementing team. The overall in charge manager of this level is project manager. The second level of evaluation will involve different stakeholders and internal specialist evaluator. The third evaluation of this project will include external project evaluator. The project evaluator evaluates the whole project annually and then prepares evaluation annual report of the project. Areas to evaluate will include checking the cash outflow in a project, the resources plan, and implementation schedule, overall progress of the project and the direction of the project. Evaluation will allow project manager and management team to make decisions in order to meet project deadline, to produce quality product or services and to use money according to the budget allocated. But evaluation team of year five will includes internal and external experts of evaluation, stakeholders who have high interest and high power within a project, project manager, project sponsor, government and community.

5. 3 Quality Management

The purpose of quality Management is to ensure that the projects meet specification and customer requirements (Smith 2008). This project will produce the product which has high quality. In order to manage the quality of the product, the quality management team will be created. This quality management team will work together with monitoring and evaluation team.

5. 4 Project Timing and scheduling

This project will be done into four phases. Phase one will be completed at the end of year one, phase two will be completed at the end of year two, phase three will be completed at the end of year three and phase four will be completed at the end of year five. The table below shows project activities with its corresponding durations.

Table 2: Project scheduling

S. NO

Activity

Duration in

(Days)

Immediate Predecessors

Visit site

01

—

Design house Plan

35

A

Prepare Land

35

AB

Lay foundation

70

C

Pouring water on foundation

60

D

Brickwork to floor 1

100

E

Pouring water on floor 1

100

F

Monitoring and Evaluation

20

G

Brickwork to floor 2

100

G, E&F

Pouring water on floor 2

100

I

Brickwork to floor 3

100

J

Pouring water on floor 3

100

K

Monitoring and evaluation

14

L

Brickwork to floor 4

100

M, K

Pouring water on floor 4

100

N

Roof carpentry

90

O

Fix windows and doors

90

P

Install toilets and bathroom

90

Q

Plumping pipe work

90

P

Install Electricity

90

P

U.

Monitoring and evaluation

14

T

V.

Writing project report

30

U

W.

Project closure/submit project to client

1

V5. 5 Project Gantt chart

Activity

Duration(days)

Immediate Predecessor

Numbers of duration in years but divided into phase of 6 months

1

2

3

4

5

6mnts

6mnts

6mnts

6mnts

6mnts

6mnts

6mnts

6mnts

6mnts

6mnts

A

01

—

B

35

A

C

35

AB

D

70

C

E

60

D

F

100

E

G

100

F

H

20

G

I

90

GE&F

J

60

I

K

90

J

L

60

K

M

14

L

N

100

M, K

O

60

N

P

60

O

Q

60

P

R

60

Q

S

70

P

T

70

P

U

14

T

5. 6 Project Budgeting

PROJECT BUDGET (IN TSH) 000'

NARRATION

YEARS

TOTAL

INCOME

2012

2013

2014

2015

2016

NSSF

240, 000

220, 000

200, 000

185, 000

270, 000

1, 115, 000

PSPF

270, 000

300, 000

190, 000

210, 000

165, 000

1, 135, 000

Total Income

510, 000

520, 000

390, 000

395, 000

435, 000

2, 250, 000

Expenditure

Administrative expenses (A)

Currency in TSH.

1

C. E. O

15, 000

18, 000

22, 000

25, 000

28, 000

108, 000

2

Project Manager

18, 000

20, 000

25, 000

30, 000

35, 000

128, 000

3

Engineers

7, 000

8, 000

9, 000

11, 000

15, 000

50, 000

4

Human Resource Manager

10, 000

12, 000

14, 000

16, 000

17, 000

69, 000

5

Accountant

8, 000

9, 000

10, 000

11, 000

12, 000

50, 000

6

Personal secretary

2, 000

3, 000

5, 000

7, 000

9, 000

26, 000

7

Transport allowances

10, 000

12, 000

13, 000

15, 000

16, 000

66, 000

8

Monitoring and Evaluation

7, 000

10, 000

13, 000

—

15, 000

45, 000

9

Contingency

5, 000

6, 000

7, 000

8, 000

9, 000

35, 000

Subtotal (A)

82, 000

92, 000

118, 000

115, 000

147, 000

542, 000

equipment's Expenses (B)

Currency in TSH.

1

Office equipment

8, 000

—

—

—

8, 000

2

Office furniture

12, 000

—

—

—

12, 000

3

1 Project Vehicles

70, 000

—

—

—

—

70, 000

4

Fuel

10, 000

12, 000

14, 000

16, 000

18, 000

70, 000

Subtotal (C)

100, 000

12, 000

14, 000

16, 000

18, 000

160, 000

Construction Expenses(C)

Currency in TSH.

1

Designing Work

13, 000

—

—

—

—

13, 000

2

Electrical work

—

—

—

—

50, 000

50, 000

3

Engineering Work

40, 000

45, 000

50, 000

55, 000

60, 000

250, 000

4

Plumbing Work

—

—

30, 000

35, 000

40, 000

105, 000

5

Building Work

100, 000

120, 000

130, 000

150, 000

170, 000

670, 000

6

Carpenters Work

—

—

—

50, 000

55, 000

105, 000

<https://assignbuster.com/installation-of-solar-power-system-construction-essay/>

Roofing Work

—

—

—

30, 000

30, 000

60, 000

7

Labour Charge

40, 000

45, 000

50, 000

60, 000

70, 000

265, 000

8

Decorator work

—
—
—
—
30, 000

30, 000

Sub Total (C)

193, 000

210, 000

260, 000

380, 000

505, 000

1, 548, 000

Grand Total

2, 250, 000

Table 4: Project budget

PROJECT RISK ANALYSIS

According to businessdictionary. com(2011), Risk is a probability or threat of a damage, injury, liability, loss, or other negative occurrence that is caused by external or internal vulnerabilities, and that may be neutralized through pre-emptive action. All projects have risks which in one way or another may affect the project to meet the goal and objectives according to the plan. In

<https://assignbuster.com/installation-of-solar-power-system-construction-essay/>

order to overcome these risks project manager is required to overcome potential hazards that a project may be exposed to.

6. 1 Risk Identification

This project will face the following risks;

Delaying of fund

Poor time management and budget

Bad weather

Key employee will not present when needed

Required resource material will not be delivered on time

Inflation

Natural Hazard

Labour strike

6. 2 Risk Probability

S/NO

Risk Name

Probability of Occurrence

A

Delaying of fund

Low

B

Poor time management and budget

Low

C

Bad weather

Low

D

Key employee will not present when needed

Medium

E

Required resource material will not be delivered on time

Low

F

Inflation

Medium

G

Natural Hazard

Low

H

Labour strike

Low

Table 5: Risk ranking

6.3 Criticality Matrix

According to a lecture delivered as part of module ARUM28EMK criticality matrix can be used to identify risk based on marking the probability and impact assessment: High, Medium and Low (Sassman 2011).

Low Probability

Medium Probability

High Probability

High Impact

Delaying of fund

Poor time management and budget

Labour strike

Inflation

Medium Impact

Required resource material will not be delivered on time

Key employee will not present when needed

Low Impact

Bad weather

Natural Hazard

Table 6: Critically matrix

Risk Urgency assessment

Risk Name

Risk Category

Probability of Occurrence

Magnitude of Impact

Risk response

Low

Medium

High

Low

Medium

High

A

Financial

Follow up source of fund several times

B

Operational

Set stable budget and contingency

C

Environmental

Flexible on doing activities

D

Resource

Prepare two or more key persons , don't depends on one person

E

Resource

To order material in advance

F

Financial

To increase budget

G

Environmental

To increase Contingency fund

H

Operational

Conduct several meeting with employee

Table 7: Risk Urgency assessment

CONCLUSION

This project focuses on construction of students' hostel at Tanzania Public Service College (TPSC) Tabora Campus. The construction of hostel will increase number of students at TPSC as well as their academic performance.

This project is very important project because it addresses the problems facing TPSC students and gives the output which will solve the existing problems. Also this project will not affect environment but will facilitate the conservation of environment. Through this project more than 100 peoples will get temporary work which will give them income. So this project will benefit students of TPSC Tabora Campus as well as the country as a whole.

ANNEX 1: LOGICAL FRAME WORK

NARRATIVE SUMMARY

VERIFIABLE INDICATORS

MEANS OF VERIFICATION

ASSUMPTIONS/RISKS

Overall goal

To improve academic performance and standard of living for students through building hostel by 2016.

Reduced number of failures by 40%

Increase number of student living within the campus by 50%

Examination Result

Hostel data

—

—

Project purpose

To build hostel at TPSC Tabora Campus that will accommodate 1000 students

Number of students living within Campus increased by 50%

Working hostel

Hostel and Admission data

Delay of fund

Lack of Material

Natural hazard

Output(Expected Results)

Working Hostel

Academic Performance improved by 40%

Students who attends night lecture are increased by 40%

Students living within the College increased by 40%

Increased number of pass by 40%

Increased number of students who attends night lecture by 40%

Increased number of students who living within the Campus by 40%

Examination results

Class Attendance

Hostel data

Activities

Visit site Design house Plan

Prepare Land/ clear site

Lay foundation

Brickwork to all floors

Roof carpentry

Fix windows and doors

Install