ECO-BRICKS

RECYCLING CENTRE

PRELIMINARY RESEARCH

Background Information

Saibai Island is located **4km south** of **Papua New Guinea** and **north** of **Australia**. The proximity between the countries and Island allows for the exchange of:

- Trade
- Cultural knowledge
- Familial relations
- Job prospects or opportunities

Torres Strait Island Regional Council 2012, *Torres Strait Island Regional Council Planning Scheme Saibai Island*, viewed 10 August 2024, <https://www.tsirc.qld.gov.au/sites/default/files/70%20-7.2.12%20Saibai%20Island%20-%20local%20plan%20code.pdf>.

CONCERNS

However, the Island's geographical factors and slow societal development makes it susceptible to numerous issues such as:

- Poor waste management
- Water and sanitation issues
- Infrastructure concerns
- Energy challenges
- Climate change adaption
- Absence of information and communication technology

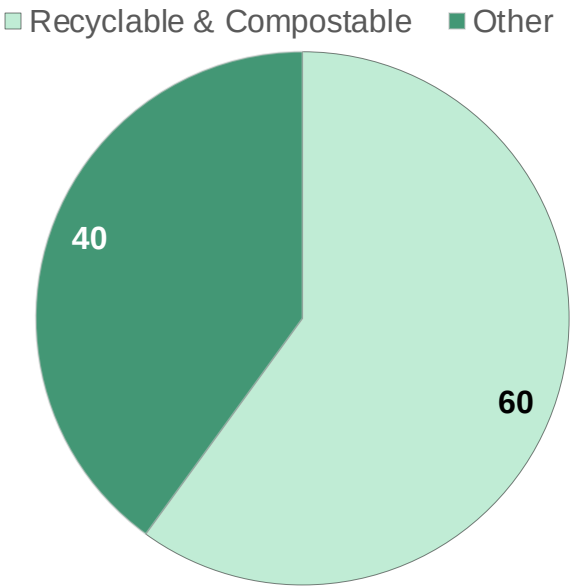
DOMESTIC WASTE

A single resident accumulates **430 kg** of waste annually

Community generates **145, 340 kg** of waste every year

Poor domestic waste management due to:

- Economic limitations
- Absence of waste regulations
- Lack of storage facilities



Waste Material Percentage

How might we

use plastic waste as a resource to optimise and improve the current domestic waste management on Saibai Island?

Current Waste Management Plan

Residential waste bins are emptied **twice** on a weekly basis and relocated to the Island's primary landfill site, **near** the Telstra connection tower in the **west**.

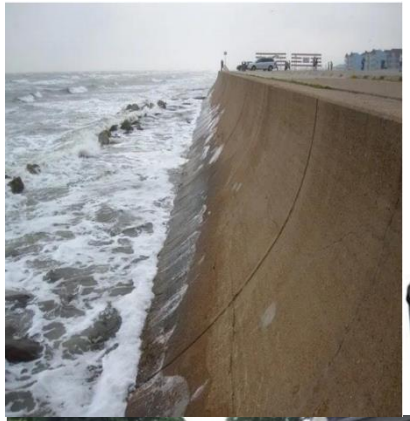
This location is convenient for **marine waste export**, however:

- Only specific types of waste can be exported
- Waste bins do not adhere to biosecurity regulations
- Large concentration of waste placed in the single landfill site

DESIGN REQUIREMENTS

- Reduce waste that ends up in landfill
- Create a symbiotic relationship between the community and the new waste management plan
- Maintain safe working environment
- Extend the useful lifespan of a product
- Reduce plastic waste washed up on Beach
- Simple to maintain
- Affordable for TSIRC
- Reduce complexity of waste management

POTENTIAL OPTIONS



DESIGN MATRIX

	Considerations							
	Economic	Cultural	Environmental	Geographical	Materials	Sustainability	Weather	
Weight	5	2	7	3	6	7	5	35
Fence	6	8	7	8	7	6	7	250
Seawall	7	6	8	6	7	9	5	251
Recycling Centre	6	9	6	5	7	7	7	231
Waste Vehicle	1	5	4	3	4	5	4	131
Eco-bricks	8	5	7	6	6	7	8	242
Waste Export	5	5	4	4	8	4	3	166
Waste Bin	5	5	8	6	6	7	5	229
Control	5	5	5	5	5	5	5	

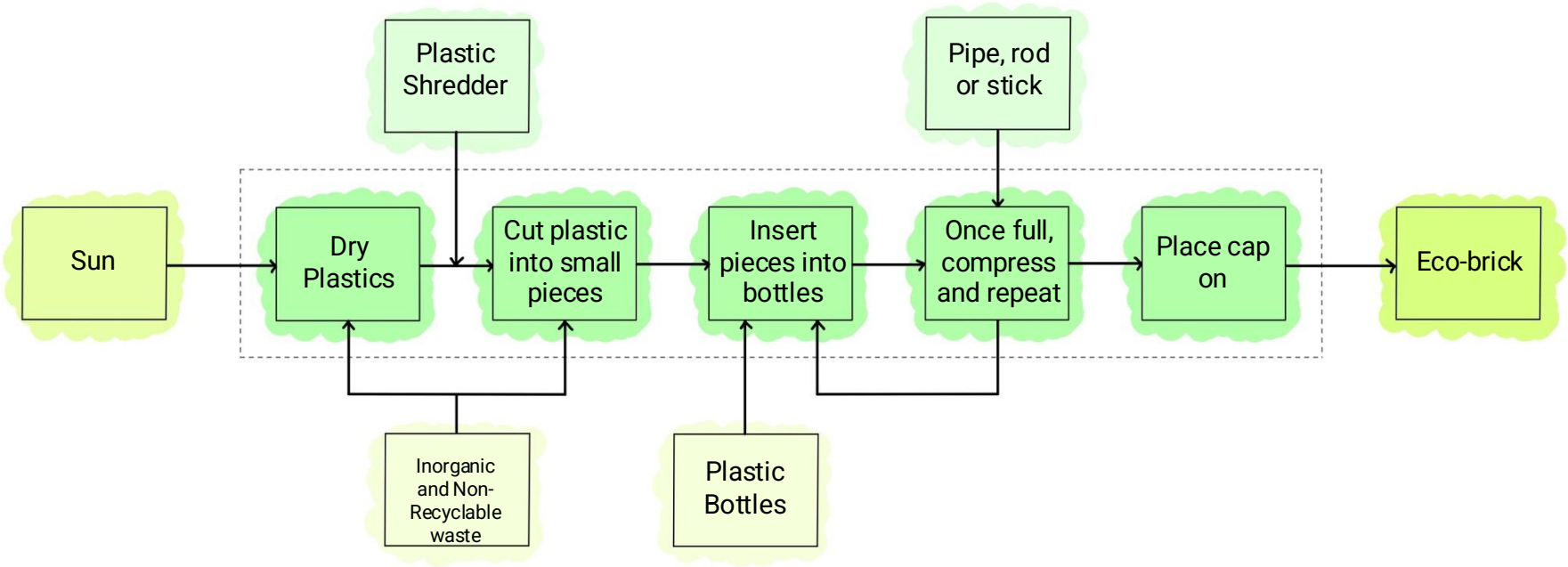
5 = Neutral (neither positively nor negatively impacts)
10 = Positively Impacts
1 = Negatively Impacts

ECO-BRICKS

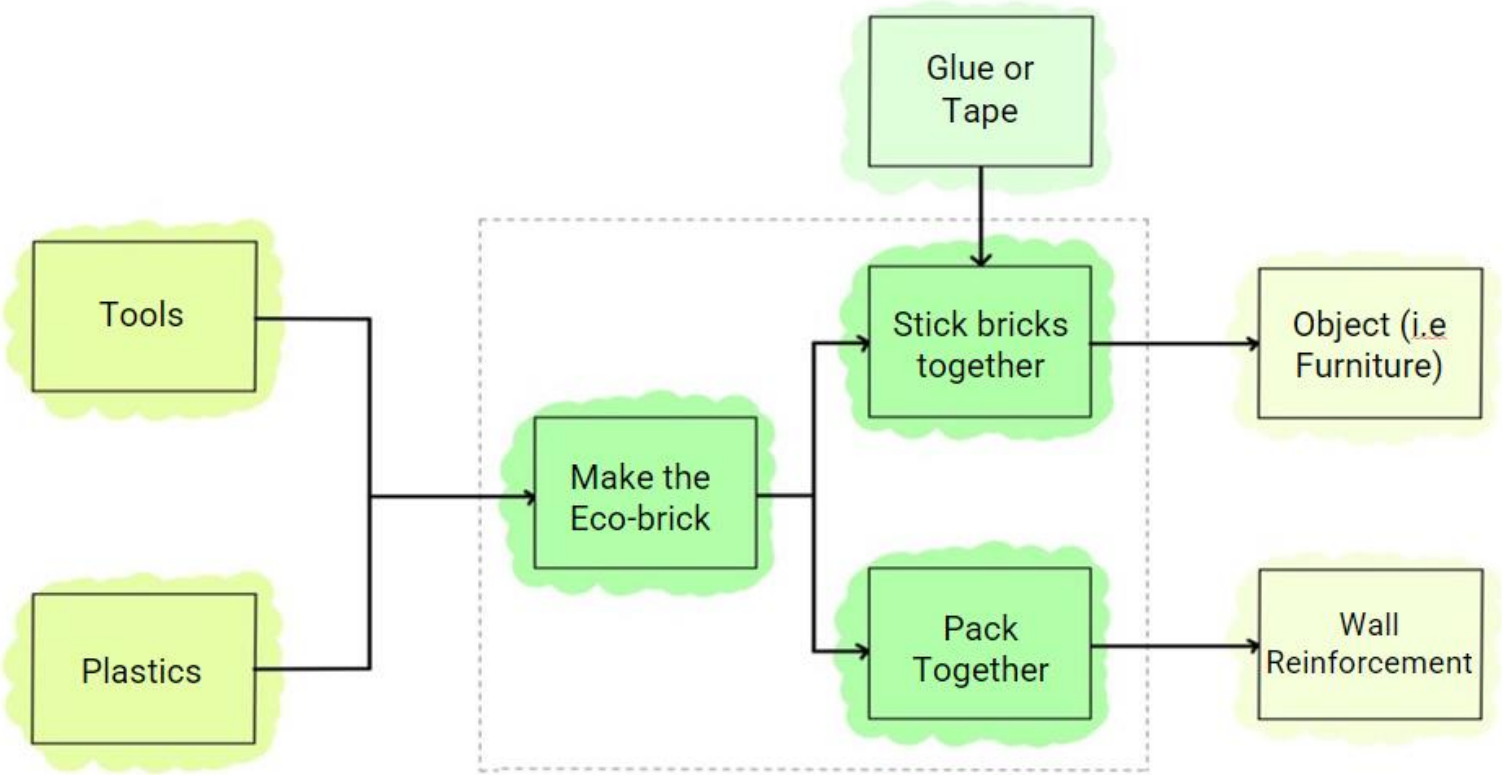
Eco-bricks are plastic bottles filled with non-organic waste to allow the bottles to mimic the physical attributes of an actual clay brick.

- The plastic and non-organic waste will never fully degrade, indicating a long usage period
- Less plastic and waste will be present on the landfill site
- Environmentally and economically friendly
- Multipurpose in use and application

FUNCTIONAL DIAGRAM 1



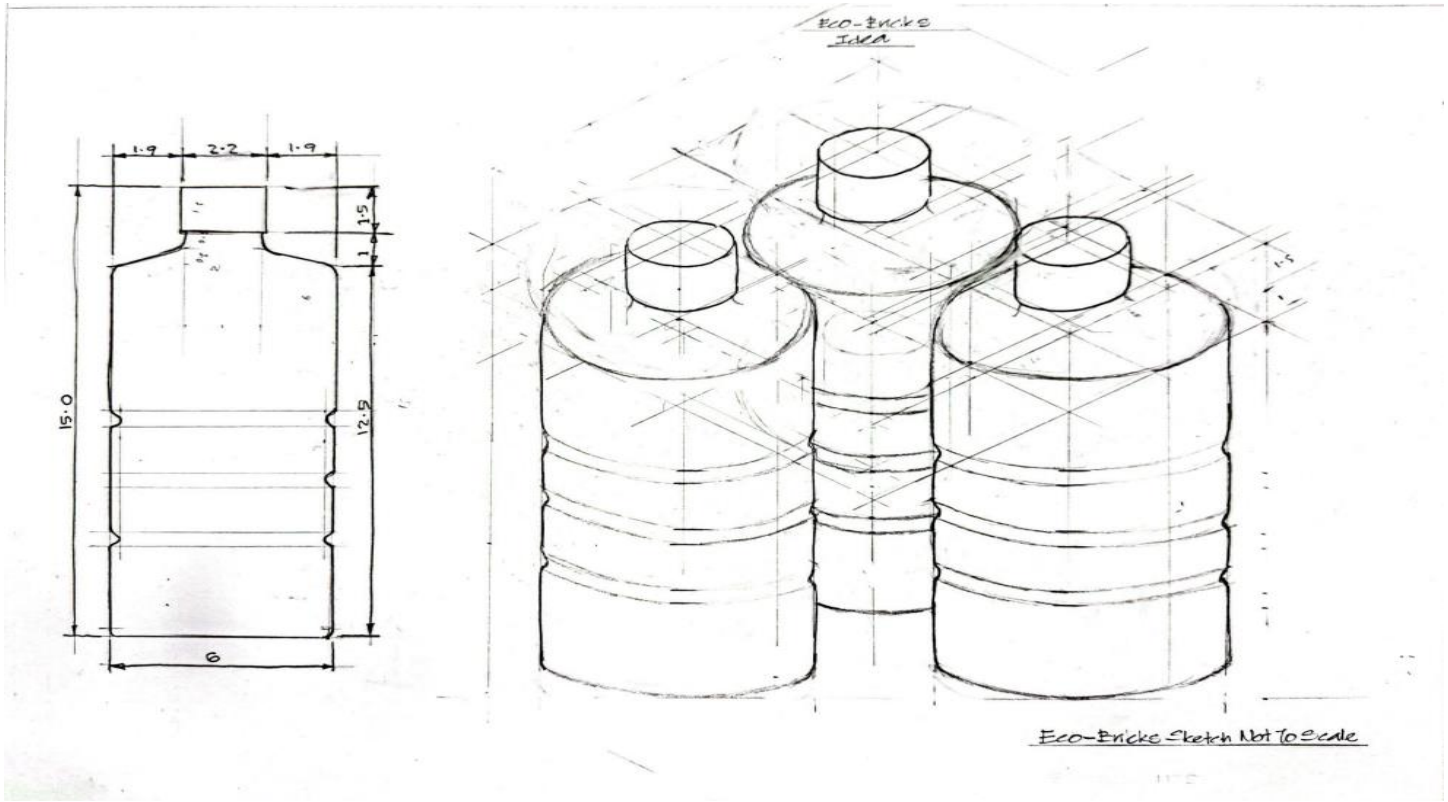
FUNCTIONAL DIAGRAM 2



Ecobrick Project: Ecobrick Round House (Global Ecobrick Alliance 2024)

ECO-BRICK PROTOTYPE

ECO-BRICK: DESIGN SKETCH



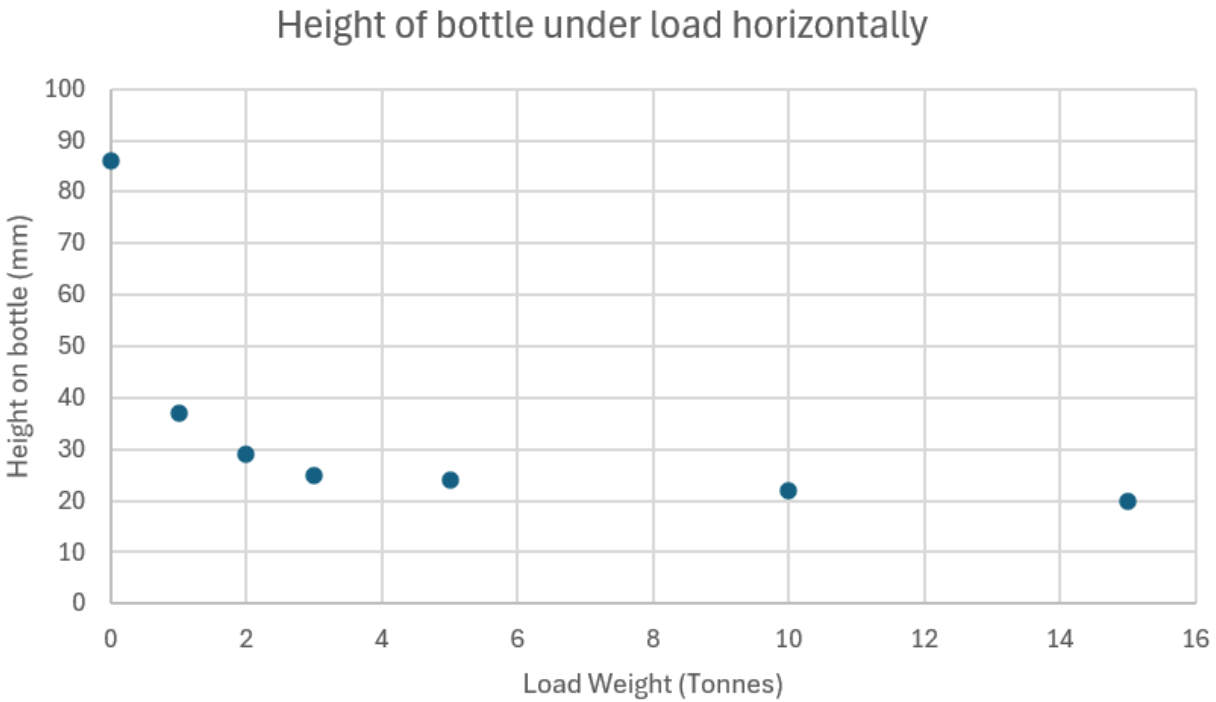
Prototype: Phase 1

Maximum weight before mechanism failure:

447.5Kg

Prototype: Phase 2

Prototype: Phase 2



Maximum load weight vertically:

1 Tonne

Maximum load weight Horizontally:

15 Tonnes

RECYCLING CENTRE PROTOTYPE

RECYCLING CENTRE

Official Opening of the Community Recycling Centre - MidCoast Council

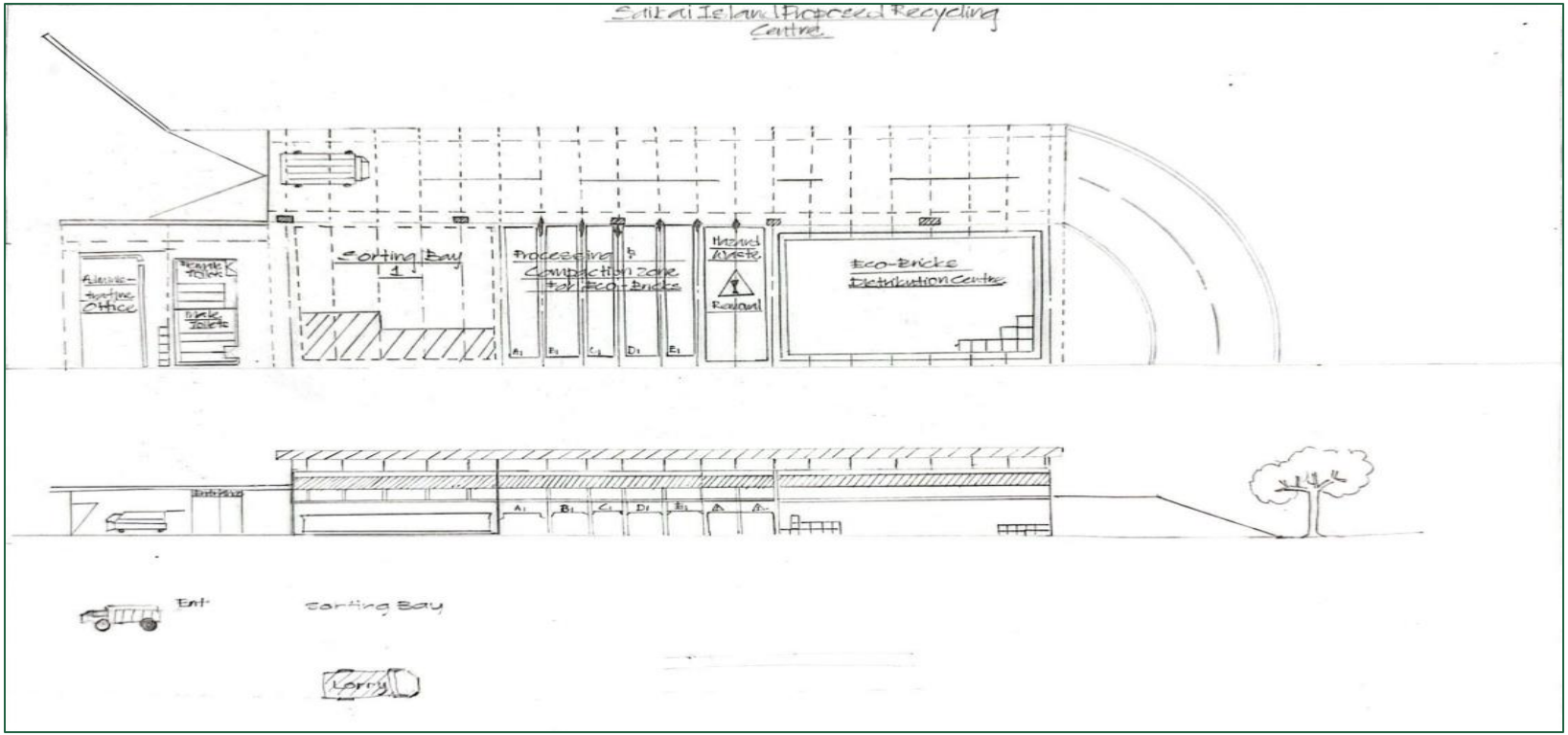
A recycling centre would be a housing and production plant for the eco bricks. It would process all incoming materials of plastic and give jobs to the locals.

- It will be built with engineering and intensive planning to ensure longevity
- Less plastic and waste will be present on the landfill site
- Environmentally and economically friendly
- Increase local job opportunities

PROJECT COMPARISON

Port Julia Progress Association recycling and storage depot

RECYCLING CENTRE: BLUEPRINT SKETCH



STORYBOARD: SAIBAI ISLAND COMMUNITY WASTE COLLECTION INITATIVE

The people of Saibai coming together into building a sustainable future for the present and upcoming generations.

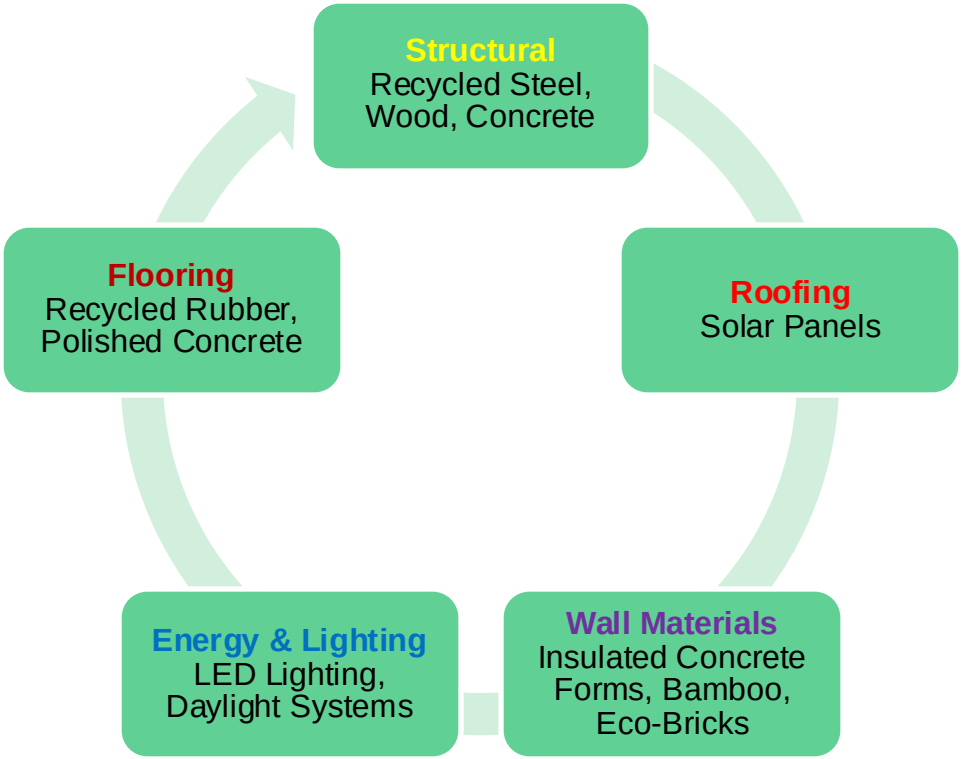
RECYCLING CENTRE: LOCATION

Map of Town of Saibai (TSIRC 2015)

STORYBOARD – WHAT HAPPENS IN THE RECYCLING CENTRE

The creation of eco-bricks by compressing cleaned dried plastics into recyclable bottles. which is an innovative and impactful endeavor to reduce plastic waste and build a sustainable future.

HOW IS THE SUSTAINABLE RECYCLING CENTRE BUILT



STORYBOARD: ECO BRICKS

"Envisioning the Future - Eco-Bricks Implementation on Saibai Island."

FINANCES

FINANCIAL STATEMENTS: ECO-BRICKS

EXPENSES	SOURCE	QUANTITY	INDIVIDUAL COST	BUDGET
Plastic Bottles	Local waste site		$0	$0
Recycled/Compostable Waste				
Pen Knives		*Approx.* 25 each	~ $4 each	~ $125
Plastic Shredder		*Approx. 5*	~ $200	~ $1000
Cutting Mats		*Approx.* 25	~ $20	~ $300
PPE		*Dependent*	~ $30	*Dependent*
Containers		*Dependent*	~ $5	~ $50
Funnels	*Dependent*	*Approx.* 20	~ $5	~ $50
Shelves	*Dependent*	*Dependent*	~ $40	~ $200
Working Table	*Dependent*	*Dependent*	*Dependent*	~ $1000

FINANCIAL STATEMENTS: RECYCLING CENTRE

INITIAL START-UP COST: $ 100, 000

OPERATING COST: $ dependent on project timeline

LARGE SCALE DEVELOPMENT ASSESSMENT FEE: $ 6,590

LONG-TERM ASSETS:

- Isolate the type and amount of waste exported
- Generate potential profits and promote tourism via events

EXPENSES	SOURCE
Construction Team	Pilchers Concrete
Accommodations	Council Accommodation
	2 x 3 Bedroom House (Capacity of 3 singles)
Material Supplies *Recycled steel & concrete*	Pilchers Concrete
Utilities	Saibai Island
Permits	Saibai Island Queensland Government
Transportation	
Fuel	
Labour Force	
Materials & Equipment	*dependent*
Electricity	Saibai Island
Water	

SUPPORT & FUNDINGS

TORRES STRAIT ISLAND REGIONAL COUNCIL

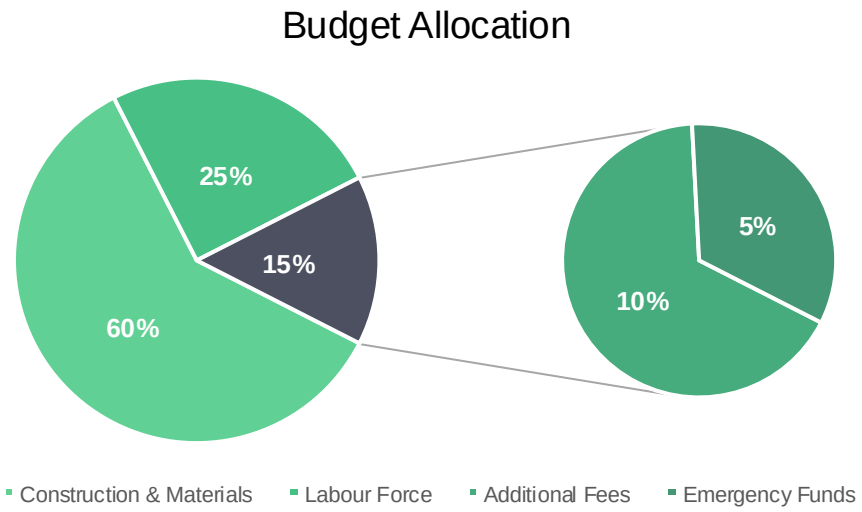
Provide support in terms of:
- Permit Application
- Accommodation fees
- Transportation expenses
- Labour force
- Project funding via grants

ECOBRICKS.ORG
GLOBAL ECOBRICK ALLIANCE

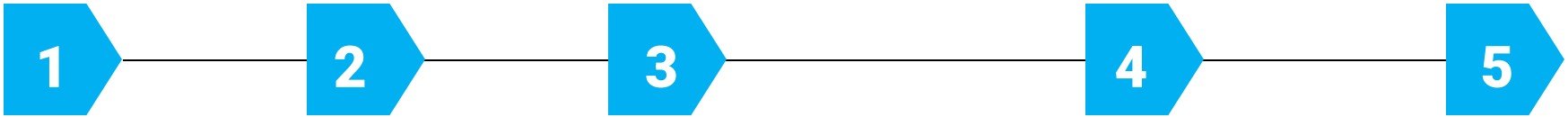
Provide support in terms of:
- Equipment
- Furniture
- Teaching Resources
- Project Funding

QUEENSLAND GOVERNMENT
DEPARTMENT OF INDIGENOUS AFFAIRS

Provide support in terms of:
- Permit Application
- Project funding via grants



Project Timeline



PLANNING STAGE

12 MONTHS

Conversing with locals to begin determine the project outlines

Approval for all the building and construction

Planning the production of eco-bricks and construction of recycling centre

RESOURCE STAGE

2 MONTHS

Gather necessary funds via sponsors and partners

Begin transporting the equipment, supplies and materials to the island

CONSTRUCTION STAGE

6 MONTHS

Begin building the recycling centre

Double checking the quality and functionality of the appliances and tools in the building

IMPLEMENTATION STAGE

2 MONTHS

The centre is fully furnished and ready to create eco-bricks

Locals are informed and taught how to maintain the building and create the bricks

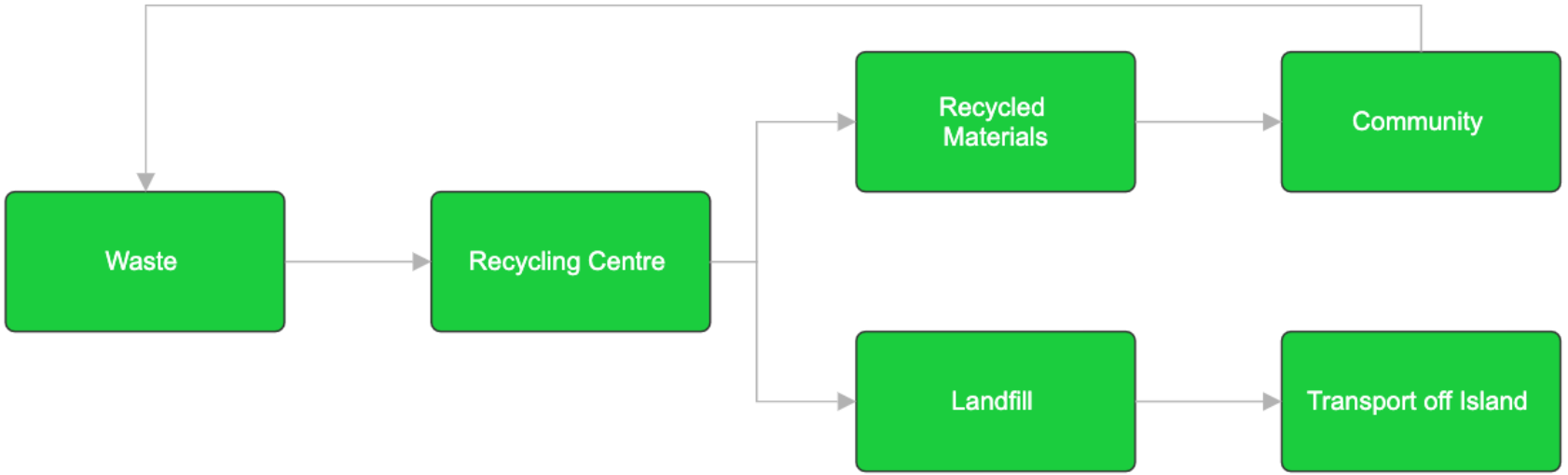
REFURBISH STAGE

ANNUALLY

Centre is subjected to a thorough check and assessment

Anything broken or worn down will be replaced within the next two weeks

PROJECT SUMMARY



THANK YOU