



Module 2 - Trainers Guide

Green Business Basics

ENGLISH - SOLOMON ISLANDS

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Cover photo: Women selling vegetables in local market. Source: Benjamin Keni, GGGI PNG.

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ABBREVIATIONS

°C	Degrees Celsius
CFL	Compact Fluorescent Lamp
CO ₂	Carbon dioxide
CSR	Corporate Social Responsibility
GB	Green Business
GE	Green Economy
GGGI	Global Green Growth Institute
HP	Horsepower
KOICA	Korea International Corporation Agency
KM	Kilometre
LED	Light Emitting Diode
LPG	Liquified Petroleum Gas
LPH	Litres per Hour
LW	Learner's Workbook
Mts	Minutes
MW	Mega Watts
NGO	Non-Governmental Organization
PAYG	Pay as you Grow
PIDF	Pacific Islands Development Forum
PNG	Papua New Guinea
RE	Renewable Sources of Energy
RO	Reverse Osmosis
USA	United States of America
TOT	Training of Trainer
TG	Trainer's Guide
TV	Television
V	Volts
W	Watts
WASH	Water Sanitation and Hygiene

GLOSSARY

Bookkeeping: Bookkeeping is the recording of financial transactions and is part of the process of accounting in business. Transactions include purchases, sales, receipts, and payments by an individual.

Corporate Social Responsibility: Corporate social responsibility, is a type of international private business self-regulation that aims to contribute to societal goals of a philanthropic, activist, or charitable nature, by engaging in or supporting volunteering or ethically oriented practices.

Green Business: A sustainable business or a green business, is an enterprise that has minimal negative impact or potentially a positive effect on the global or local environment, community, society, or economy

Green Entrepreneur: An entrepreneur with a business idea that addresses an environmental challenge or problem. They can help shape the future and steer society towards more sustainable products and lifestyles.

Green Jobs: Green jobs are decent jobs that contribute to preservation or restoration of the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency.

Green Wash: Greenwashing, also called “green sheen”, is a form of marketing spin, in which green PR and green marketing are deceptively used to persuade the public that an organization's products, aims and policies are environmentally friendly.

Microfinancing: Microfinance, also called microcredit, is a type of banking service provided to unemployed or low-income individuals or groups who otherwise would have no other access to financial services. The goal of microfinance is to ultimately give impoverished people an opportunity to become self-sufficient.

Microgrid: A microgrid, is a local energy grid with control capability, which means it can disconnect from the traditional grid and operate autonomously.

Normal Grid: An electrical grid, electric grid or power grid, is an interconnected network for delivering electricity from producers to consumers.

PAYG: Pay as you go. The investor invests in biogas. The biogas is valued in energy terms, and you pay the monthly instalments as you go. Once you have paid for the loan and interest through the PAYG model, the biogas plant becomes your own.

The “Green Business Basics” training module is a continuation to the modules on Green Economy – General Principles and Energy Efficiency.

Upon completion of the course, the learners will achieve the following learning outcomes:

- Understand what green business is
- Identify elements of Green Business and differences between Green Business and Greenwashing Business
- Identify the steps to establish and run a Green Business in compliance with Green Business Model
- Understand inputs and outputs of business and ways of changing to Greener Alternatives

HOW TO USE THIS GUIDE

The trainer guide is provided with the class notes and includes activities which need to be done after each section of the course. The guide acts as a recommendation only. After seeing the situation on the ground in each community, the experienced trainers may use their judgment to modify their delivery and assessment techniques to achieve better results.

The Trainer Guide provides detailed notes written in the form that can be directly delivered to the learners. However, the very detailed notes are intended to broaden the knowledge of the learner as well. You are not required to read each paragraph from the Trainer Guide, but you are expected to know the materials sufficiently to train others. Firstly, you must know what key concepts the learners need to learn. These are normally called learning outcomes. The learning outcomes are all listed at the start of the Trainer Guide, and you must ensure that at minimum, every learner achieves those 4 learning outcomes. You are required to take at least a week to go over the TG and go through the activities in the Learner Workbook. During the actual training you can refer to the Trainer Guide and explain it to the learners in your own words. If you are unsure of something always refer to the TG notes. Also note to take heed of the time recommended for each session and activity.

In case where learner literacy levels are low, trainers are advised to adapt to the situations and modify activities as appropriate. It is advisable to keep a continuous record of competencies of learners. All competencies are achieved when learners fulfil all learning outcomes.

HOW TO CONDUCT ACTIVITIES

- Activities are best done in groups or pairs. It is recommended that in each group there is at least one who is more literate or a more active learner who can help to translate and explain the training contents to learners who are slower to understand.
- You may divide the learners into groups of at least 2 and preferably 3-4 learners and ask them to carry out a rigorous discussion within the group. Some activities can be given to the groups for overnight preparation. The trainer needs to be aware of the dynamics of relationships in the community when dividing learners into groups. Sometimes women and youth are not free to share their

views when the men from the communities are present. The trainer should ideally ask learners for their guidance when organising them into groups for discussions.

- Ideally the learners may present the results of their activities to the class and have a class discussion based on their findings.
- It is not necessary that all groups present in the same activity.
- However, it is important that all groups are given opportunity to present or verbally discuss their answers.
- At all times, encourage learners to be interactive and participative in class.
- Learners must be encouraged to be vocal and to contribute actively to class discussions.
- To better improve learning, the learners must be encouraged to strongly inquire about the topics through questions.
- The activities allow trainers to observe if the learners have achieved the learning outcomes. If possible, do keep record of the learner's achievement of learning outcomes so that you can help them learn better. A sample record table is given in this guide.
- Adapt existing activities and/or alternative suitable activities in case the desired literacy levels of learners are not met or the desired resources are not available.

TEACHING TOOLS

The following tools/items may be required to enhance learner learning:

- Laptop/ computer and projector to play videos or present notes to the whole class. This will depend on availability. In case this is not available, you are recommended to take large prints of the key concepts and display to the learners while teaching.
- Provide each learner with pen or pencil, and paper to allow them to participate.
- Whiteboard and markers or black board and chalk can be made available to allow both facilitator and learner to state a point.
- The Learner Progress Record sample given below can be used to observe learners, note their feedback, and assess if they have achieved the specific learning outcome. This recording is useful for both the learner and trainer so you can focus on those who are falling behind. Note there are no marks to be awarded and the record is only to improve learning. This is entirely optional

TABLE 1: Learners Progress Record – optional for trainers to use

Learner Progress Record (Optional)		Date:
Learner's Name:		
Learning Outcomes	Achieved Outcome (Yes or No) and Comments	
1. Define green business		
2. Identify the elements of a green business and describe the difference between green business and Greenwashing business		
3. Identify the steps needed to establish and run a business in compliance with green business model		
4. Understand the inputs and outputs of a business and describe ways of changing to greener initiatives		

LESSON PLAN AND TIMES

TABLE 2: Lesson Plan and recommended timing of each session

Chapter	Lesson Type	Recommended Time (mts)
Inaugural Session		30
1. Ice Breaker - Introductions	Theory and activity 1	15
2. Green Business Basics	Theory	40
	Activity 2	15
3. Establishing Green Business Model: Linked to SDG Goal	Theory	40
	Activity 3	10
4. Green Business Initiatives	Theory optional	90
	Activity 4A	20
	Activity 4B	15
	Activity 4C	15
	Activity 4D	15
5. Way Forward	Theory	20
	Activity 5	15
Role play 1		15
Role Play 2		15

A large, white, stylized number '1' is positioned on the left side of the page. The background is a gradient of teal and blue, with a vertical line separating the blue area on the left from the teal area on the right. The number '1' is white and stands out against the blue background.

Ice Breaker Introduction

Trainers must understand that the learners who are attending the module have taken time from their usual daily activities which sustains their livelihood. Most will also be very nervous and unclear regarding what the module is all about. Hence the trainer must ensure that the learners are comfortable and not too nervous. It is important to make them feel at ease so that they can focus on the module and absorb as much knowledge as possible.

Tell them that this is an informative module and there will be no tests or marks in this. You must inform them that this

module is being run so that they can take the information to help themselves to transition to renewable energy. Even if they do not use it, they can always use the knowledge to help others. In any way this module will better equip them to help grow their communities. Tell them to be at ease and focus on enjoying the day and asking as many questions as they want. Also tell them to not worry too much about complicated things as you will guide them through this.

ACTIVITY 1

Introduce yourself briefly to the learners. Ask if they are all comfortable at the venue. One by one ask them their names and tell them to give some details about themselves – such as what they would normally be doing at that time and what they hope to gain from the module at the end of the day. In addition, if time permits – ask them what they think about Green Business. There is no correct answer, and the goal of this activity is simply to get them relaxed and engaged into the

session. You may crack few light jokes as laughter always lightens the mood and helps learners relax. Ask the learners about their prior experiences in green business and how much they know about the topic. Also ask them what they wish to gain from this training session and record their answers on paper so that it helps the trainer in setting a direction to the course. This input will help the trainer direct the training to the learners needs.

2

Green Business Basics

The Green Economy General Principles module gives the basics of green economy principles. This module on Green Business Basics is one of the road maps to 'Go Green'. The practice of Green Business outlined in the module, will lead to an improved environment, and reduce carbon footprint.

Solomon Islands, Fiji, Vanuatu, and PNG are rich in, forests, greenery, and seashores. These countries are spread over several small islands. Therefore, access to grid power is extremely limited, which makes solar power a very viable alternative. There is a need to preserve the greenness of all these islands. Therefore, following the 'Green Business Model' aims to recommend measures to preserve the

"greenness" and create sustainable communities. Following a Green Business model is also expected to reduce the impact of climate change and vagaries of the weather.

2.1 What is Green Business

Green business refers to sustainable businesses that has no negative impact on the global or local environment, the community, society, or the economy. A green business meets triple bottom line,¹ that is, the people, profit, and planet. They are backed with progressive environmental and human rights policies.

FIGURE 1: Green Economy Principles²



Well Being: A green economy will create genuine, sustained, shared well-being, going beyond monetary wealth to prioritize human development, health, happiness, education, and community.



Justice: A green economy emphasizes equity, equality, community cohesion, social justice and supporting human rights. This is especially for the rights of marginalized minorities. This seeks a just transition and serves the interests of all citizens, including those yet to be born.



Planetary Boundaries: A green economy recognizes that all human flourishing depends upon a healthy natural world. It defends nature's function and limits and protects biodiversity, soil, water, air and other ecosystem capitals.



Efficiency and Sufficiency: A green economy is low carbon diverse and circular. It recognizes that our biggest economic challenge is the need to create prosperity within planetary boundaries, and align economic incentives with true costs to the society.



Good Governance: A green economy builds institutions that combine dynamic democratic accountability, relevant metrics, sound science, and local knowledge. Civil life prioritizes public participation, social dialogue, informed consent, transparency, and accountability.

The green economy objectives are given in Figure 1 above. These are described to the extent required to the community.

- **Wellbeing** - means going beyond making money. This improves the quality of life through access to energy, water, reduced pollution, and education.
- **Justice** - means equality in human rights even for marginalized communities.
- **Planetary Boundaries** - aims to preserve natural resources, hoping for a healthy world. It also aims to protect biodiversity, soil, water, and other ecosystems.
- **Efficiency and Sufficiency** - focuses on green and circular economy, which was covered under module 1 on Green Economy – General Principles.
- **Good Governance** - seeks community participation in activities, accountability, transparency, and creation of green jobs.

For the community, it means a more environmentally friendly livelihood that improves their quality of life. This is achieved by energy efficient cooking, proper waste disposal, clean drinking water and ensuring the participation of women and marginalized groups in the projects and so forth.

The community needs to find money for practicing green business, be it buying a solar lamp, buying a water tank to store drinking water or improved firewood cooking stove. The additional money spent will go a long way in improving health of households and the community.

The Module outlines the initiatives to be taken for cleaner energy, water, waste management and other measures beneficial to the community.

¹ "Sustainable business", Wikipedia, https://en.wikipedia.org/wiki/Sustainable_business

² Adapted from: Global Green Growth Institute, <http://gggi.org/site/assets/uploads/2019/06/5-principles-of-GE-One-Pager-250619.pdf>

2.2 Elements of Green Business

The elements of green business are the people, profit and planet. This was detailed in the Module 1 on Green Economy-General Principles. Any business is run by people with profit as the motive. Green businesses integrate sustainable thinking into every aspect of their operations from management to software. Truly committed green businesses, are tasked with monitoring and managing a wide range of elements, including solid and hazardous waste, water and energy conservation, pollution prevention, and recycling.

FIGURE 2: Elements of Green Business³



Figure 2, gives the elements of green business and these are:

- Follow quality business practices. Invest and procure good quality material that are sourced and produced sustainably (e.g., Quality seeds for agriculture, organically grown vegetables etc.)
- Clean and environmentally friendly workplaces (housekeeping, shops, roadside vending etc.)
- The green products are costly. A normal (incandescent) bulb will cost about 20 US cents whereas LED is about 1 USD. The green products are healthier. For example, use of Light emitting diode (LED) type lights gives you better quality of light and improves your productivity, generates less heat and consumes less power. The module on energy efficiency has more details. This is compared to using

kerosene lanterns and normal bulbs, which are not bright enough and produces harmful fumes, and consumes more energy and cost to run.

- Using clean water improves your health by reducing water borne diseases.
- The practice of manufacturing, sourcing of green products should catch up for sustainable profits.

The other elements of green business, namely payment of fair wages and equitable distribution of benefits across the value chain are not relevant to the community, and hence not detailed.

The following is the way forward to greening the community:

- Obtaining and using green products such as (LED Lights, water filters)
- Eliminate use of plastic bags. Use environmentally friendly products such as paper bags and cutlery made from recycled paper, banana leaves and coconut leaves for packaging.
- Whenever you buy /sell (business with others), you should ensure green practices are followed. (e.g.- Fisheries, vegetables, grocery). The various measures are detailed later in the manual
- Ensure the green products you procure, are transported packed and stored in eco-friendly manner (e.g., Storing in reusable containers, no use of plastic bags).
- Conserve human energy and refrain from the use of child labour. Children below 14 years of age should be in school to study. If they are made to work (domestic help, industry, shops), this is child labour. Children are paid less than the adult workers. The green business does not permit people to use child labour. Many countries have laws which do not allow children to work.
- Recycle and reuse: Recycling is when, instead of using a material once and then disposing, materials such as plastics, glass or metal are recycled to be used again. Reusing, is similar to using water from home instead of spending money to buy a new bottle of water every day, including reusing the water bottle every day.

The sustainability initiatives relevant to the community are:

- Proper waste management and disposal. Waste should be separated as biodegradable and non-biodegradable. The biodegradable waste is one which decomposes when dumped. These include vegetable waste, farm waste. The biodegradable waste is dumped in landfills and for composting. A non-biodegradable waste does not degrade. These are plastics, cans used for soft drinks, batteries, glass, etc. A plastic thrown as waste, takes years to degrade.

³ Adapted from "The Sustainable Business", Gordon Business, https://theecologist.org/sites/default/files/styles/inline_1/public/NG_media/113615.jpg?itok=DPeCGp6O

The non-biodegradable waste goes to the recycler, for recycling and recovering the metal.

- The greener initiative suited to the community is to refrain from plastics for packaging your products. You have many green products made from recyclable material (e.g., Banana leaf, baskets made from coconut leaf etc.)
- Plan Sustainable initiatives for your community to encourage green businesses as described above. This can be done in cooperation with community leaders and government agencies.

2.3 Green Wash

FIGURE 3: Greenwash Concept⁴



A greenwash is a false claim of greening (Figure 3). This is done by the manufacturer to sell the product. For example, when you buy a LED which is not branded (Philips), the lamp will fail faster and consume more power than what is given in the name plate from the manufacturer. Some examples relevant to the community are items sold that are not energy rated.

Our Pacific Island countries have a very green environment, compared to the western world. We need to focus on sustaining the greenness.

At the national level, it is essential to check that the products imported from other countries and those manufactured locally, are meeting the required standards. In Vanuatu, (Figure 4) there have been instances where imported consignments were rejected, and permission were not granted for the importer, as they did not meet the required standard.⁵

FIGURE 4: Example of Green Wash⁵

The company imported several types of electrical appliances, such as refrigerator units, air conditioning units and lighting units that are regulated by the act. However, the equipment and appliances, were not initially registered especially the refrigerator units as required by the Act. The company was issued a penalty notice, which amounted to VT 96,000 for which payment was done accordingly.

The refrigerators were imported directly from China, and the models were not registered. Therefore, the company was required to provide test reports to prove that they comply with AS/NZ minimum energy efficiency standards and labelling requirements. The same has not been provided as of now.

Other examples of green wash are:

- Companies in developing nations, sending plastic waste to lesser developed countries for processing.
- Chocolates using cocoa have a green label. The cocoa is sourced from places where child labour is used for harvesting the cocoa. Therefore, not green.
- Palm oil refining. The collection of palm seeds is done by child labourers. The women (sometimes pregnant) and children carry heavy weight- thus, not green.
- Cosmetics (skin cream/soap/nail polish/shampoo) are branded off as using herbal products. There are other chemicals used. The advertisement videos, used for promoting the products; make women stand in chemical solutions for hours. Further during product development, so many combinations are used damaging skin- not green.
- Use of chemical preservatives in food processing /fisheries – not green

⁴ Adapted from the Green World Project Blog, <https://thegreenworldproject.com/blogs/news/greenwashing-and-6-toxic-ingredients-hiding-in-all-natural-products>

⁵ Source: Energy Newsletter, Vanuatu

ACTIVITY 2

Target: Local government officials, Provincial Councils, District Councils, Town Councils, Island Councils, etc.

1. How do you promote green business in your area?

As a green initiative, green business can be promoted by Government agencies by:

- Creating Awareness on the concept.
- Waste Segregation and Management
- Programmes for potable water and
- Government based incentives for growth

2. What are the elements of a green business and how do you work towards the same?

- Quality Business Practices: Important even in government policies / programs
- Environmentally friendly workplace- maintain our offices well.
- Provide incentives to work on Green Business
- Campaigns for avoiding plastic use / ban plastic use.

Target: Traditional community/religious leaders, women, youth, and vulnerable groups (single mothers, elderly), etc.

1. What is Green Business?

Green business refers to sustainable business that have no negative impact on the global or local environment, community, society, or economy. A green business meets triple bottom line, i.e., people, profit, and planet. For the community it means having access to a clean source of energy, water and preserving the environment.

2. What are the elements of green business?

- Follow quality business practices. Invest and procure good quality material (e.g.: Quality seeds for agriculture, organically grown vegetables etc.)
- Clean and environmentally friendly workplace (housekeeping, shops, roadside vending etc.).
- The green products are costly. A normal bulb will cost about 20 US cents whereas LED is about 1 USD. The green products are healthier. For example, using light emitting diode (LED) type lights gives you better quality of light, and improves your productivity and generates less heat. When compared to using kerosene lanterns and normal bulb, which are bright enough but produces harmful fumes.
- Using clean water improves your health by reducing water borne diseases.

- The practice of manufacturing, sourcing of green products for sustainable profits.

3. How do we initiate measures for greening the community?

- Obtaining and using green products such as (LED Lights, water filters).
- Eliminate Use of plastic bags. Use environmentally friendly products, such as, paper bags and cutlery made from recycled paper.
- Whenever you buy /sell (business with others) you should ensure green practices are followed. (e.g.- Fisheries, vegetables, grocery). The various measures are detailed later in the Manual.
- Ensure that the green products you procure are, transported, packed and stored in eco-friendly manner (e.g., Storing in reusable containers, no use of plastic bags).
- Conserve Human energy and refrain from the use of child labour. Children below 14 years of age should be in school to study. If they are made to work (domestic help, industry, shops), this is child labour and children are paid less than the adult workers. The green business does not permit people to use child labour. Many countries have laws which do not allow children to work.
- Recycle and reuse.
- Waste Segregation and Management

4. What is the difference between biodegradable and non-biodegradable waste?

Biodegradable waste is one which decomposes when dumped. These are vegetable waste, farm waste. The biodegradable waste is used as land fill and for composting. A non-biodegradable waste does not degrade. These are plastics, glass bottles, cans used for soft drinks, batteries, glass etc. A plastic thrown as waste, takes years to degrade. The non-biodegradable waste goes to the recycler for recycling and recovering the metal.

Target: Local electricians, people with technical aptitude, etc.

1. How will you practice green business guidelines in your work?

- Procure quality material for maintenance replacements
- Dispose old spares/ repair waste in an ethical way
- Housekeeping of my workplace

2. How do you create awareness in the community people, who use your services on green business?

By explaining how you are contributing to healthier environment, for example explaining the green products LED lights/solar products; and etc.

Target: Small Businesses

1. How do you make your business greener?

- Housekeeping of the premises
- Separate place for waste disposal
- Avoid unnecessary commuting

2. What are the Green Practices you would follow?

- Avoid child labour all along the supply and delivery chain.
- Provide equal opportunities for women and men.
- Follow ethical business practices (fair wages).
- Invest a portion of the profit on green initiatives.

3

**Establishing Green
Business Model:
Linked to SDG**—————

These are linked to SDG goals:

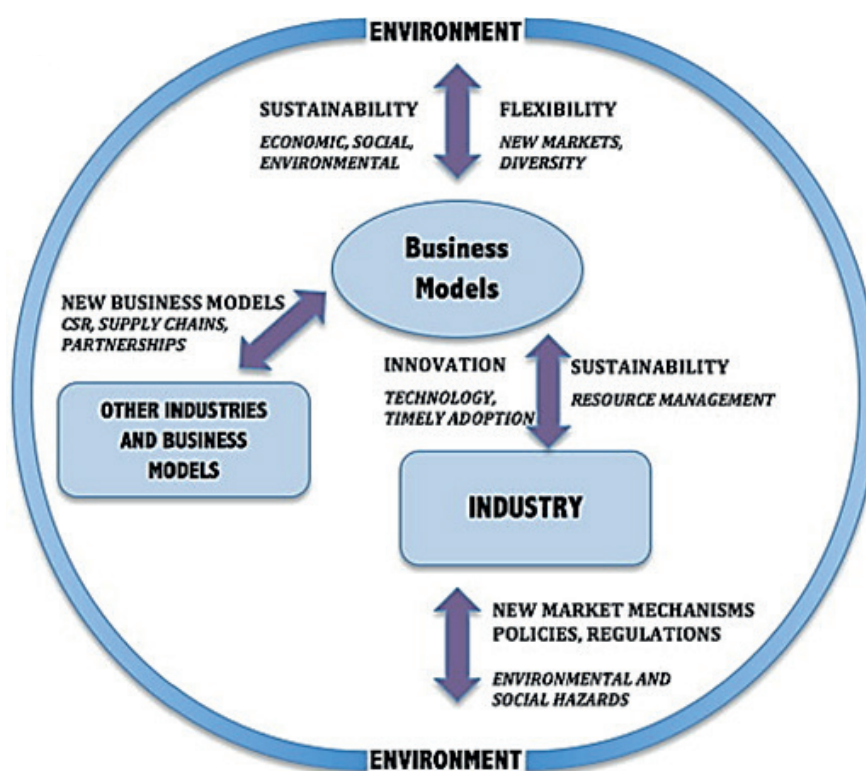


3.1 Establishing and Running a Green Business Model

The sustainability pillars are social, economic, and environmental activities. The business model is therefore expected to establish and run green business, like any other business taking care of sustainability. The elements of green

business are people, planet and profit. Any green business model should address these issues. The people's objective being profit, this should be carried out in a sustainable manner so that the planet (water, air, soil etc.) is safeguarded. The product has to be 'Green' (environment friendly, recyclable, energy efficient). The concept is given in Figure 5 below. This gives a general business model. The points relevant to the community are elaborated.

FIGURE 5: Green Business Model⁶



Amongst the above, the following needs to be addressed:

- Identification of new markets (Handicrafts, fisheries, Vegetables, packaging)
- Establishing co-operatives for the stakeholders (women, NGOs) through a proper business model
- Appropriate policies by the government to promote these initiatives.
- Concessional financing

The stakeholders, while keen on developing the market should take care to address environmental and social hazards.

Integration of other businesses into the green business model. (e.g., Grocery store can sell organic products, solar product seller can sell fuel efficient stoves, solar cookers etc.)

⁶ Adapted from Science Direct "Emergence of Green Business models: The case of algae biofuel for aviation", February 2014, <https://doi.org/10.1016/j.enpol.2013.10.034>

Some examples of Green Businesses are:

A company in Solomon Islands, is passionate about creating sustainable livelihoods for their rural communities. This company presently works with more than 50 village producers across the Solomon Islands and sources from over 3,500 hectares of Certified Organic plantations owned by more than 1,000 farmers across the country, and they are focused on adding more. Over 60% of oil revenue, goes back to the communities which provides an income to over 5,000 people.⁷

A company in Suva, Fiji has a colourful array of island dresses, skirts, blouses, men's shirts, jewellery and clutch purses bearing unique prints all using local materials. This has been successful through perseverance and discipline when dealing with time and money.

A women entrepreneur in Vanuatu originally employed elsewhere started a small enterprise to manufacture body massaging oil, soaps, moisturisers from locally grown nangai and coconut oils.⁸

3.2 BUSINESS MODEL FOR THE COMMUNITY

A green product needs to address sustainability, is flexible to changes and is innovative. The products chosen should add value, save energy, be affordable and acceptable. A lot of handicrafts are made by the community such as wallets, cloth, baskets, use local products available in the community. The middlemen and exporters pay very small money, and they export at fabulous prices. In order to get the right selling price for the product, there are initiatives such as Rise beyond the reef⁹ and other handicraft centres that provide training, on the selection of quality raw material to ensure product quality, a right selling price for the product and that packaging does not use plastics.

The market needs to be innovative (e.g., solar lamps along with regular product, mobile charger as a source of income, selling drinking water, handicrafts etc.).

The basic motive here is 'return on investment' and additional source of income. For example, women in the community used kerosene lamps earlier and needed to spend money on buying kerosene. Now with solar lamps, the women save the money by not buying kerosene, and could use the extra money. Savings generate additional income.

In order to make a product /project green, an assessment of present environmental conditions is desired. Based on the country/s available data the environmental issues are in its initial stage. In this case, it is essential to preserve the environment now before it gets worse and much harder or impossible to control.

Whenever any green product is marketed, be very sure it does not contribute to environmental pollution/contamination (e.g.: Drinking water bottled and sold, market products packed in plastic covers etc.). It is necessary to make the product environment friendly. The example here is plastic is used everywhere (cutlery, packaging, bags etc.). The replacement for plastic; must be user friendly. You can use banana or coconut leaves for packaging food instead of plastic bags. The technology should be simple to meet the needs of the local community with materials readily available to the locals.

FIGURE 6: Co-Operative Model¹⁰



⁷ Pacific Islands Private Sector Organization, "Collective Impact in the Solomon Islands", http://www.pipso.org.fj/for-pacific-businesses/stories-from-around-the-region_trashed/success-stories_trashed/collective-impact-solomon-islands/

⁸ Loop Pacific, "The Woman behind Oils of Paradise", June 2017, <https://www.loopvanuatu.com/vanuatu-news/woman-behind-oils-paradise-61827>

⁹ Rise beyond the reef, www.risebeyondthereef.org/arts-crafts/

¹⁰ Adapted from training materials of the Cooperative College of Fiji.

One of the suggested business models is 'Cooperative Model' (Figure 6). This can be applied to fisheries, vegetable shops, cold stores etc. A group of like-minded people (including men, women and other vulnerable groups) join and form a cooperative. This is to be done as per the applicable cooperative laws of the country. The cooperative invests some money, and the balance is sourced from the bank. The profits are shared after payment of the loan each year. Regular meetings are held to sort out any issues.

Figure 7 below gives you the principles of Cooperatives.

Membership is voluntary and meetings are conducted, and issues are sorted out in a democratic manner. There is economic participation by sharing the expenses, and profits.

FIGURE 7: Principles of Co-operatives¹⁰



ACTIVITY 3: ALL TARGET GROUPS

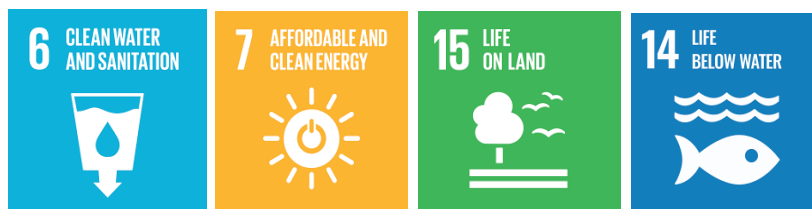
1. What are the relevant points for establishing a green business model in the community?

- a. Identification of new markets (Handicrafts, fisheries, Vegetables, packaging).
- b. stakeholders (women, NGOs) establishing a Co-operative through a proper business model.
- c. Appropriate policies by the government to promote these initiatives.
- d. Concessional financing.
- e. The stakeholders while keen on developing the market should take care to address environmental and social hazards.
- f. Integration of other businesses into the green business model. (e.g., Grocery store can sell organic products, solar product seller can sell fuel efficient stoves, solar cookers etc.).

4

Green Business Initiatives

These are linked to SDG goals:



4.1 Present Practices in the Community

Current bad practices and recommended community alternatives:

Present	Recommendations
Inefficient Cooking – leads to smoke – respiratory diseases – faster use up of resources such as firewood.	Use Energy Efficient Stove – Covered in Module 3 (Energy Efficiency Basics). The community may not be able to afford energy efficient stoves. Therefore, government/NGO initiatives are needed as this will improve health of the people.
Water- Sources from river, stream, ground etc. Not clean and unfit for drinking and cooking- leads to water borne diseases	Use treated water for drinking. Ensure water drinking storages are covered well, to keep it clean and safe (not a breeding hub for mosquitoes). Water must be boiled before drinking
Throwing waste in the surrounding, no proper segregation and dumping.	Separate waste, have a proper landfill and recycle waste. Use a pit for composting and use this as fertilizer.
Agricultural waste – open burning in field- smoke	Proper disposal through composting.
Use of Kerosene lamps, candle – Poor quality of light, produces a lot of smoke and does not last long	Shift to energy efficient stoves and solar home systems- Elaborated in Renewable Energy Module

The table above highlights the basic needs of the community, being energy, water, waste disposal and others and the Greener Business Initiatives are detailed in that order.

4.2 Green Business Initiatives – Fuel and Electricity

Present Scenario

Most of the communities do not have access to grid power. They use either kerosene lamps/ battery powered torches or solar individual or home lighting systems. This takes care of individual lighting requirements of the houses.

FIGURE 8: Normal Grid¹¹



¹¹ Source: UMLAUT, https://www.umlaut.com/uploads/images/stories/_1024x768_crop_center-center_none/iStock-661805558_web.jpg

A normal power from the public utilities is given in Figure 8. This is shown as an example and not elaborated further.

Proposed Initiative

FIGURE 9 : Microgrid¹²

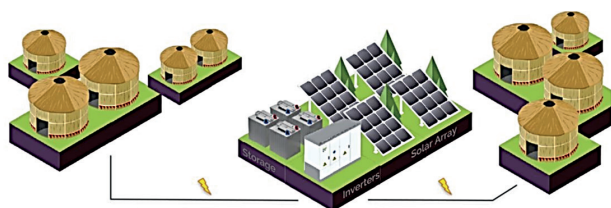


Figure 9 above shows a microgrid. The solar power is a larger one, and power can be supplied to more houses in the community. The community houses pay for the power used -either on a fixed basis or based on metering. Depending on the size of the solar panel, power can be supplied to as little as 4 houses (size about 400W) or larger one.

In some communities there can be mixed loads like mobile towers, school, business activity. Therefore, the loads are classified ABC as follows:

Anchor Load: Fixed load available all the time (mobile tower, school petrol bunks etc.)

Business Loads: Small Business Loads like grocery stores, small markets etc.

Consumer Loads: Individual Houses

The following are the advantages of micro-grid:

- Hybrid models (solar, generator, Pico hydro etc.) can be combined to operate when there is no solar power or on rainy days. Depending on the location, the hybrid model needs to be tailor made.
- Whenever the electricity system gets damaged due to cyclones/floods, the solar based system can be repaired, and power generation can start faster.
- The investment will be about USD 1500 for a 500W solar panel, and this can supply power to 4 households.
- Larger ones can be designed up to any level of power.

This proposition is feasible after a detailed project report and needs funding. Various governments have different donor funded initiatives to promote microgrids. This is particularly suitable for the countries covered under this project as there are number of small islands.

Biomass Pellets

Firewood and most other biomass (saw dust, Agri-waste) has high fine particles. This burns off faster, generating fine ash. It is possible to compress and extrude the same into pellets (Figure 10). This can burn better, for a longer time and reduce smoke etc.

Figure 10: Biomass Pellets¹³



- Suitable for a new entrepreneur as this requires investment.
- Can use wide range of fuels.
- To make pellets, the biomass must first be cleaned to remove contaminants. The clean biomass is then ground in a hammer mill or chipped to a uniform size, which must be less than the thickness of the pellet that will be produced. Grinding down biomass helps to reduce the power required for driving the pellet mill as input wood will be smaller in size.
- Raw material depends on local source.
- Needs to invest on raw material collection, transport and pelletizing equipment.
- Needs an investor, project developer and implementer on a profit-sharing basis

This is proposed as a business initiative. The fuel for the community being free, it is not viable. This is used as a fuel source in tourist resorts, hotels, industries.

This is presently not available in any of the countries covered. This is proposed as a future green initiative.

Bio-Gas Plants

The common agricultural waste disposal methods include:

- burning,
- dumping,
- land filling,
- composting
- random piling, and so on.

¹² Saur Energy, <https://www.google.com/search?q=%3B+https%3A%2F%2Fwww.sauenergy.com%2Fsolar-energy-articles%2Fmissing-the-sunshine-mini-grids-in-india&rlz=>

¹³ Source: DH Gate, <https://www.dhresource.com/0x0/f2/albu/g17/M01/2B/D9/rBVa4mAL44eAfRo2AANK-6hnTI8598.jpg/electrical-poultry-chicken-fish-feed-pellet.jpg>

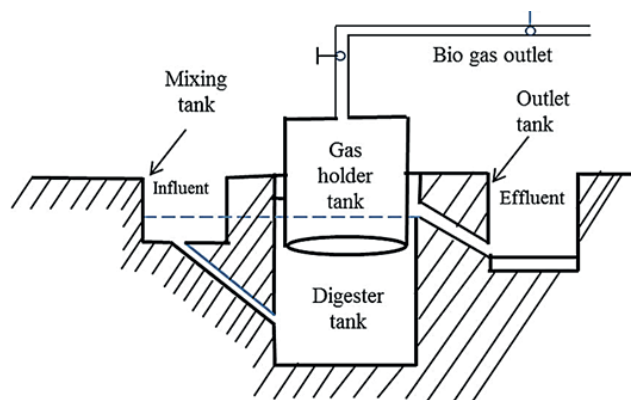
All these methods may cause pollution and is a waste of resources. Above mentioned agricultural organic wastes contains multiple nutrient elements, which can be made into organic fertilizer through composting.

Some are composting the waste (organic fertilizer).

FIGURE 11: Biogas Plant- Solomon Islands¹⁴



FIGURE 12: Biogas plant Flow Diagram¹⁵



Proposed Practice:

- Agricultural waste, vegetable waste, animal waste etc. degrade naturally when thrown away. This can be converted into fertilizer by using composting methods. These wastes are termed organic. They have energy stored in the organic waste.
- The process of degradation generates biogas (Figure 11 and Figure 12 above). There are bacteria which live in the absence of air called anaerobic. These bacteria use waste

as food, and in the process generate biogas. The biogas is rich in Methane. The other constituents are carbon dioxide (CO_2) and hydrogen sulphide (H_2S)

- In composting, the fuel value is lost. In biogas plant fuel (that is, Biogas) is recovered.

The influent (input to the digester in Figure 12) is diluted waste. The inlet waste is mixed with water. This then flows to the digester tank. The bacterium in the digester generates the gas. This gas is collected in the floating gas holder. The gas holder moves up and down. The effluent (output from the digester) is a very high value fertilizer and is collected in the outlet tank. The gas from the gas holder is transported by pipeline to the kitchen for cooking or lights or to run the gas engine to generate power.

- The size of the biogas plant can be small for a family or large for a community.
- This is suggested as a stand-alone business, where the investor invests on the plant, operates and maintains it. He can apply charges for the Biogas.
- Apart from use as fuel this can be used for lighting and also to drive engines.
- The government of Solomon Islands have initiatives for promoting biogas plant.¹⁶

Fuel Efficient Stove

This has been well explained in Energy Efficiency basics model. Another model of cooking stove (Figure 13) is given below

FIGURE 13: Fuel Efficient Stove¹⁷



¹⁴ Source: SolBridge "Creating Renewable and sustainable energy from waste," <https://www.solbridgelt.com/biogas-for-home>

¹⁵ Research Gate, "Economics of Biogas plants and solar home systems: For household energy applications", June 2017, https://www.researchgate.net/figure/Simple-schematic-of-a-biogas-plant_fig3_318503013

¹⁶ SOPAC Technical Report, "Individual Country Biomass Resource Assessment Profiles for Fiji, Kiribati, Samoa, Tonga, Tuvalu & Vanuatu, December 2003, https://pacific-data.sprep.org/system/files/TR0364_0_1.pdf

¹⁷ Olympus Flower, "Rocket Stove", http://www.solar-cookers-rocket-stoves.co.za/ol_images/ray_solar_cooker.jpg

Solar Cooking

There are two routes to solar energy - "solar photovoltaic" and "solar thermal". The photovoltaic route is for producing power (electricity) while the thermal route is for heating. The solar thermal route is used for cooking, for example, there are very large solar cookers used to cook tons of rice.

FIGURE 14: Solar Cookers

A¹⁸: Box Type Cooker



B¹⁹: Parabolic Collector



There are two types of cookers shown in Figure 14. Figure A is a box type cooker. The box of the lid when open is the solar collector. It reflects the sun on the pot, placed in the box. The box can be closed after cooking. Figure B is a parabolic collector, and the concentrated solar parabolic collector reflects the sun light on the pot.

- Suitable as an add on product for small grocery, electrical and others as a greener alternative and additional fuel.
- Though cooking takes more time, women can parallelly work on other activities (tailoring, embroidery, local arts and crafts)
- Useful for boiling rice, vegetables, lentils etc.
- Slower cooking allows for more health food.
- Not Suitable for frying or high temperature cooking
- Need to rely on other means of cooking on non-sunny days.

4.3 Green Business Initiatives – Water

This is one of the most relevant initiatives of Greener Alternatives. At present though water (surface and ground water) is consumed without any treatment. Therefore, this cannot be potable (drinking and cooking). Water is used for agricultural purposes apart from domestic use.

FIGURE 15: Water Use- Present²⁰



Present Practice

- Source of water is streams, river, ground water
- No piped water in most of the communities.
- No mechanism to use rainwater.
- Water from open wells is sometimes contaminated.
- Proximity to low lying swamp and pit toilets make water unsafe for drinking
- This water is directly used for all purposes (drinking, cooking, washing, and gardening)
- Drinking unclean water can lead to water borne diseases.
- Piped Water may not be clean.
- The communities being cyclone prone, the water storage tanks get damaged, and the pipelines are broken.
- Rainwater too murky and its untreated, usage leads to water borne diseases.

18 Rudra Solar Energy, "Solar Cookers", <https://www.rudrasolarenergy.com/solar-cookers.html>

19 Olympus Flower, "Solar Cookers", http://www.solar-cookers-rocket-stoves.co.za/ol_images/ray_solar_cooker.jpg

20 Photo Credit: Rolland Gito/World Vision Solomon Islands, <https://www.wvi.org/sites/default/files/Wash-FactSheet-APRIL16-lowres.pdf>

FIGURE 16: Parched Agricultural Lands²¹

Figure 16, shows parched agricultural fields. Mismanaging water resources, impairs people's ability to grow crops and feed their families.

The investment for water treatment requires huge investments. Therefore, initiatives for providing clean water become a green business proposition.

Initiatives for Clean Water

The water needs to be collected, filtered, and used, there is also scoped to collect rainwater. As a part of Water Sanitation and Hygiene (WASH) project, the Solomon Islands and other countries have taken the initiative for improved water supply and management. This is a part of the Sustainable Development Goal (SDG 6) which is promoting clean water and sanitation. Some of the initiatives are:

FIGURE 17: Rainwater Harvesting²²

Rainwater harvesting, effectively catches the rainwater falling from the building and is collected in a tank as shown in Figure 17. There are communities where there is abundant rainfall and access to alternative water is scarce. Rainwater harvesting can be used effectively in these communities.

FIGURE 18: Gravity Fed Water System²³

A gravity fed water system (Figure 18) safely transports water from a protected catchment area usually below a river, stream, or spring. This flows into the community's water tank. From the community water tank, it flows through piped lines to homes.

The other source is to drill a borehole, collect the water on the surface through a solar powered water pump and treat them before use.

FIGURE 19: Water Filtration Systems²⁴

²¹ Source: Jae C. Hong, Business Insider Australia, <https://www.businessinsider.com.au/nasa-data-shows-the-world-is-running-out-of-water-2015-6>

²² Rotary Pacific Water, <https://www.rotarypacificwater.org/>

²³ Rotary Pacific Water, <https://www.rotarypacificwater.org/>

²⁴ Rotary Pacific Water, <https://www.rotarypacificwater.org/>

The water collected from the above sources need to filter, through a bio sand filtration system (Figure 19). The tanks in the figure are filled with sand, activated carbon and other filtering material. The water becomes clean for consumption.

These are to be designed based on community requirements and a lot of money is needed to buy and also to maintain these water filtration systems.

Small Scale Water Initiatives:

FIGURE 20: Water Filter- Small Scale²⁵



This is a very good add-on for grocery shops in the community. This water filter gives clean and pure water (Figure 20). The water can be sold at reasonable prices. For people who can afford, the entire water filter could be bought. This basically has a cloth filter initially, and later an activated carbon filter for purifying. Further technical explanation is not desired here. There is no license required for small machines. The grocery store can also stack and market tender coconut water, which is available in abundance in the community. Depending on price, the customer can choose to drink water or coconut water.

4.4 Green Business Initiatives - Waste Recycling

Waste is generated in the community from homes, markets, schools and place of worship. Though comparatively the waste generation may be small compared to the urban / semi urban / rural areas, it is essential that waste is handled in an environmentally friendly way.

FIGURE 21: Waste Generation²⁶



The sources of waste generation: Domestic, vegetable waste (Figure 21), aluminium, iron, ash, paper, animal waste (bones/skin).

The Present Means of Disposal: Some vegetable waste is converted into compost. All the balance waste is disposed. The concepts of waste segregation (biodegradable and non-biodegradable) were explained in Chapter 2. The greener alternative slogan is 'Wealth from Waste'. The concept of Reduce, Reuse and Recycle (3Rs) needs to be in place. Seen as a new venture for persons with entrepreneurial aptitude

- To source funds from local lending institutions
- Send biodegradable waste to biogas plant (separately explained)
- Separate plastic, metal, paper, glass bottles.
- Glass bottles can be sold directly to the agent, who will in turn sell to drinks producers (beer, coke, hard and soft drinks)
- Sell soft drink cans metal/paper to the recycler.
- Ensure recycler uses ethical methods to recycle
- Avoid green washing concept
- Profitability depends on size of waste handled and the area covered.

Recycled Paper

There is a lot of wastepaper generated. This is from news paper, packaging, cardboards, stationery etc. This is segregated and sent to a paper recycler (Figure 22 & Figure 23).

²⁵ Price.com, <https://price.com/pureit-ultima-mineral-water-purifier-price-in-india-36139>

²⁶ Dreamstime.com, "Garden compost heap", <https://www.dreamstime.com/stock-photo-compost-heap-garden-kitchen-food-waste-vegetables-fruit-peel-green-refuse-image68229062>

FIGURE 22 : Manufacturing of recycled papers, Fiji²⁷**FIGURE 23: Recycled into Toilet paper²⁸****FIGURE 24: Paper from Banana Waste – Vanuatu²⁹**

Paper is taken from the bin and deposited in a large recycling container, along with paper from other recycling bins. The paper is taken to a recycling plant, where it is separated into types and grades. The separated paper is then washed with soapy water to remove inks, plastic film, staples, and glue. It is further processed to the quality of paper (newsprint, packaging, and cartoon).

Here the business proposition for the community is only to act as a collecting agent for the recycler. The waste from the community is collected and segregated. The paper waste is procured by paper recycler.

The intention here is not for setting up a paper business as it is investment oriented. The waste picker and segregator earn from the waste collected.

Recycling Metal

The metal is collected, segregated (Figure 25A), taken to a melting furnace (Figure 25B) and turned into liquid metal for further processing.

27 South Pacific Waste Recyclers, "Reducing Waste", <http://www.southpacificwasterecyclers.com.fj/our-product/>

28 South Pacific Waste Recyclers, "Reducing Waste and Our Product", <http://www.southpacificwasterecyclers.com.fj/our-product/>

29 Green Banana Paper, <https://greenbananapaper.com/>

FIGURE 25: Metal Processing

A³⁰



B³¹



C³²



The community waste is segregated to metal (cans, tins). This is collected and given to the scrap dealer. The scrap dealer then recycles by melting. This is then processed and sold.

Plastic Disposal

Universally, this is one of the major issues. The uncontrolled use of plastic for packaging (Figure 26) has spread globally. There are many countries which have banned single use plastics. Solomon Islands had initiated the process to ban single use plastics since November 2019, these bans are currently under development.³³ However, in the western province, people are trying their best to ban the use of plastics, emphasizing the use of recycled bags, etc.

FIGURE 26 : Plastics³⁴



FIGURE 27: Plastics and Alternatives³⁵



30 Source: wmmetalsandalloys.com, "Different types of scrap metal", <https://wmmetalsandalloys.com/wp-content/uploads/2020/02/stainless-1080x675.jpg>

31 Source: Shutterstock.com, "Converter filling scrap", <https://www.shutterstock.com/image-photo/tangshan-june-18-converter-filling-scrap-213902791>

32 Shin-ei holdings co.ltd, <https://www.shineikinzoku.co.jp/en/recycle/>

33 Adapted from the Osaka Blue Ocean Vision website, <https://g20mpl.org/partners/solomonislands#:~:text=Solomon%20Islands%20has%20initiated%20the.bans%20is%20currently%20under%20development.>

34 Source: Roguedisposal.com, "Have petrochemical companies used recycling to make more plastic.", https://roguedisposal.com/images/PlasticWars_1100x700.jpg

35 Adapted from the Marine Conservation Society Twitter: <https://twitter.com/mcsuk/status/1034524796032360453?lang=ca>

Plastics, when discarded into the natural environment, take many years to break down and in this time, it affects many forms of animal life, especially marine life.

It is proposed to source and use environmentally friendly packaging materials and bags (woven types are available locally that are made of leaves), paper cups, metal bottles for water. Avoid single use plastics (covers, straws, water bottles) as much as possible.

This is seen as a value add on green business venture for existing grocery shops. If local talent is available probably there is scope for local manufacture.

Recycling Plastic Waste

There are technologies available to recycle plastics, to granules, and then convert them to end products such as bottles, spoons, and plates). There are technologies available to convert plastics to fuel (Figure 28).

These are investment oriented, and hence not recommended to the community.

There are other initiatives where customers are paid for the plastic bottle, they return through a recycling program.

FIGURE 28: Recycling Plastic Waste & Recycled products³⁶



4.5 Green Business Initiatives- Agriculture

The present practices in agriculture and proposed Green Business alternative action:

TABLE 3: Greener Practices – Agriculture

Present Practice	Proposed Practice
Always cultivating the same crop (rice, wheat, vegetables). Growing the same crop in the same place for many years, depletes the soil nutrients	Rotation of crops. This is to be need and market based. First time cassava, then some other and then some other vegetables. Crop rotation is the practice of growing a series of different types of crops, in the same area across a sequence of growing seasons. It reduces reliance on one set of nutrients, pest and weed pressure, and the probability of developing resistant pest and weeds.
Coconut plantation/ Banana always.	Follow intercropping. Leave sufficient distance between coconut tree/ banana tree. Use the space between the two for; vegetables, green leaves (spinach). Intercropping is the cultivation of two or more crops simultaneously, on the same field. The most common goal of intercropping is to produce a greater yield on a given piece of land by making use of resources or ecological processes that would otherwise not be utilized by a single crop

³⁶ Source: Shutterstock, adapted from theconservation.com, <https://theconversation.com/the-major-source-of-ocean-plastic-pollution-youve-probably-never-heard-of-111687>

Use of water at random	Follow drip irrigation. Not suitable for marginal farmers. Investment is required. Drip irrigation is a type of micro-irrigation system that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface. The goal is to place water directly into the root zone and minimize evaporation.
Use of Chemical fertilizers and pesticides	Use organic fertilizers (as shown below) and insecticides (neem powder)

Organic Fertilizer

The output of the biogas plant / composting plant is organic fertilizer. This is better than chemical fertilizer. The products grown from organic fertilizer (ginger, turmeric, vanilla, banana) shown in Figure 29 below, have better market value and price.

4.6 Sustainable Fishing / Sea Food

The river and sea-based fishing, often use methods which are not conducive to the growth of fish/seaweed etc. These are:

FIGURE 29: Agriproducts- Using Organic Fertilizer³⁷



TABLE 4: Green Initiatives – Fisheries/Seafood/Aquaculture

Present Practice	Proposed Practice
Throwing waste into the river/ sea/ beaches etc.	Refrain from throwing waste into the sea/beach/river etc. Have a social activity to clean beaches / rivers once a month.
Use of Dynamite filled in bottles to kill fish. The use of dynamite and other explosives for fishing is commonplace throughout the tropical Pacific, although usually illegal. Dynamite fishing shatters fragile coral colonies. Even the smallest piece of dynamite can blast a crater two to three feet in diameter. The blast kills coral tissues, and the surrounding rubble prevents adjacent coral colonies from recovery	Sustainable seafood is seafood that is either caught or farmed in ways that consider the long-term vitality of harvested species and the well-being of the oceans, as well as the livelihoods of fisheries-dependent communities. To refrain from dynamite-based fishing. Fishing societies to monitor illegal fishing activities. To provide training and scientific materials at local universities and enforcement agencies to support marine conservation; purchase small water purifier systems that will be donated to local communities that shows progress in stopping dynamite fishing.
Oil spills (lube oil, fuel) into sea/ river	Make the boat owners/ship owners responsible for cleaning up
Sea Food / fisheries supply chain management	The most significant seafood retailers, brands, and foodservice companies are engaged to catalyse their global supply chains and drive actions to rebuild depleted fish stocks, reduce the environmental impacts of fishing and fish farming, and ensure sustained economic opportunities for fishing communities worldwide. These practices need to be practiced at community level.

³⁷ Slideshare.net, Slide 44 of "Kiribati Agritourism Policy Setting Workshop 2019", <https://www.slideshare.net/brusselsbriefings/kiribati-agritourism-policy-setting-workshop-2019-agricultural-valuechain-guide-for-the-pacific-islands>

4.7 Green Business Initiatives – Others

Battery Recycle

FIGURE 30: Battery Recycle³⁸



Batteries (such as those from cell phones, cars, solar systems etc.) are thrown away on land, rivers and in the sea. These materials include acid, lead, nickel, lithium, cadmium, alkaline, mercury and nickel metal hydride, which are corrosive and harmful elements to the environment and livestock, as well as marine life. When batteries are not properly disposed, the casing can disintegrate and the toxic chemicals within, can leach into the surrounding environment. In many countries new battery is given only when the old battery is returned to the distributor. The distributor is expected to act ethically and ensure no batteries in their possession ends up in the natural environment. The battery recycler then recycles acid, lead and other parts, even giving new life to old batteries for reuse.

Packaging

There are quite a few already available packaging alternatives. Where potential exists, it is better to use traditional knowledge, to develop alternatives to plastic packaging.

FIGURE 31: Packaging - Locally Available³⁹



Figure 31 shows use of banana leaves and woven baskets used locally. This is the most environmentally friendly way of packaging. The issue is to make them more attractive to users.

FIGURE 32: Packaging Locally Available Products⁴⁰



Figure 32 shows paper bags and baskets made locally.

The women in the community can be encouraged to develop paper, leaves or bamboo-based products and then develop a market. This is a very good add on to the women in the community and will ensure economic empowerment as they can earn extra money, by developing these products. The local women need to be trained and helped to market their product. There are many examples of women's groups contributing to village and community development through their earnings, with increasing women's resources likely to benefit families and the whole community. The local council or local government province/district plays a major role. Raw materials for the product, depends on local availability. However, other local alternatives can be available.

Solar Products

One of the modern-day requirements is mobile charging. The solar mobile charger is a very good add-on to the rural market. Figure 33A and Figure 33B below shows mobile chargers based on solar energy.

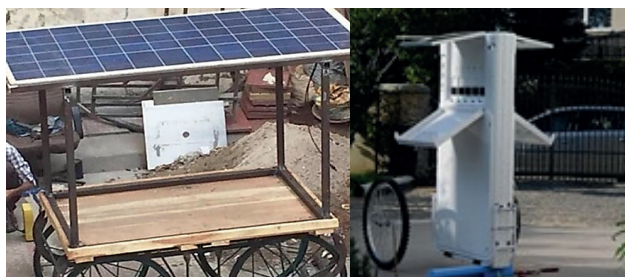
38 City of Fort Wayne, <https://www.cityoffortwayne.org/images/stories/batteriesmg.jp>

39 Adapted from Pacific Greenpreneurs: Jump starting green businesses in Fiji, Vanuatu and Kiribati, https://www.aptc.edu.au/docs/default-source/default-document-library/djsvj_christopher_and_katerina_min.pdf?sfvrsn=b620dc14_4

40 Source: Projectunify.net, "Say no to plastic bags", <https://www.projectunify.net/say-no-to-plastic-bags/>

FIGURE 33: Solar Mobile Chargers

A⁴¹



B⁴²



Figure 33A is very good example of value-added to green business ventures for local women, grocers, and vegetable vendors alike. The conventional vegetable vendor has mounted solar panel on the roof top of his vegetable vending cart. There are mobile charging points (up to 10). A small fee is charged for mobile charging. Figure 33B shows a solar light, panel, and mobile charger. The second picture shown is a more aesthetic one. Micro-financing can make it viable.

FIGURE 34: Solar Corn Roasting⁴³



This is just an example. There should be local products /ideas available.

Fisheries

Developing fisheries in terms of food security and economic development, is an important exercise for many Pacific Island countries, as most of their communities live along large coast lines. There is huge potential for commercial fishing too. There is a need to reduce post-harvest loss, develop cold storages and downstream fish processing industries. Downstream fish processing industries are processing fish and canning it for sale within the country and outside for export. There is also scope for development of in-shore fishing (aquaculture, Mari culture). Some of the initiatives relevant to this module are:

Solar Fish Dryer

Probably a viable alternative as all the countries covered have sea food and probably dry fish.

FIGURE 35: Solar Fish Drying⁴⁴



Systems for drying fish (or other such perishable commodities) using solar energy (Figure 35). In sunny days fish will be dried using solar energy and when solar radiation is not sufficient during cloudy/rainy days, LPG back up heating system will be automatically activated to supplement the heat requirement. Thus, continuous drying is possible in this system without spoilage of highly perishable commodities to obtain a good quality dried product. In communities where LPG is not available other sources of energy can be used.

When dried in the open, fish has a strong odour. Since the solar dryer uses covered drying, the odour is reduced. Needs funding and custom designed.

41 Source; Indiamart.com, "Community solar mobile charging station," <https://www.indiamart.com/proddetail/community-solar-mobile-charging-station-7163127873.html>

42 Source; Indiamart.com, "Solar Emergency Portable Led light," <https://www.indiamart.com/proddetail/sun-king-pro-400-solar-emergency-portable-led-light-with-usb-mobile-charging-17407429648.html>

43 Source; India content.in "Solar power fan to grill corn," https://www.indiacontent.in/bengaluru--75-year-old-selvamma-who-has-been-selling-corn-outside-vidhana-soudha/pr-783895/?utm_source=recengine&utm_medium=WEB&referral_sourceid=783954

44 SlideShare, <https://www.slideshare.net/upamadas/dynamics-of-development-in-fish-processing-sector-72216570>

FIGURE 36: Solar Agriculture Dryer⁴⁵

The solar drying concept can be used to dry any produce such as chillies, copra and tobacco. Figure 36, shows a solar dryer. Air is heated by solar energy and used to dry the produce in the room. Depending on the season, different products can be dried.

Cold Rooms – Solar

Fish, vegetable, meat and other products get spoiled and wasted due to lack of cold stores. A good initiative is to invest in a community cold store (Figure 37). There could be two systems, one for vegetables and another for non-vegetarian produce (meat, chicken eggs, fish). Based on the weight of the produce stored, rent can be charged from the customers.

FIGURE 37: Solar Cold Store⁴⁶

Fisheries – Pico hydro Tail Race

Apart from solar power, the communities can invest in Pico hydro plants. The water from the Pico hydro power plant, is known as tail race. An example of growing fish in Vanuatu is given below (Figure 38)

FIGURE 38: Fisheries - Pico hydro Tail Race Vanuatu⁴⁷

In Lolong village, a potential site for a pico-hydro mini-grif, the women are using waste water from the tailrace to construct fish ponds and raise tilapia fish. The first sale of tilapia fish raised over USD\$200 (Vt 20,000). Their newfound source of electricity will ensure that fish ponds are well-aerated and there is enough electricity to power their fridges for preserving fish.

Handicrafts

Rural communities are very talented in handicrafts. Some of the products are given below in Figure 39 and Figure 40.

They are not able to get a proper market and market these products.

FIGURE 39: Local handicraft displayed by local men and women in Honiara⁴⁸

⁴⁵ Indiamart.com, <https://www.indiamart.com/radha-energycell/solar-dryers.html>

⁴⁶ Greenpowerco.com.au/Eco frost

⁴⁷ Newsletter, Department of Energy, Vanuatu, https://lh3.googleusercontent.com/9AVVViShiEW2i0kLgSHvYc0BMnduj_CnC1ymp_h_Y5Qce1RW0LTAE0Vyk5HCu9Eg92-1=s170

⁴⁸ Photo credit: Yvonne Green, adapted from Wikimedia Commons, "Local handicraft at Art in the Park, Honiara, Solomon Islands, https://commons.wikimedia.org/wiki/File:Local_handicraft_at_Art_in_the_Park_Honiara_Solomon_Islands_2012.

FIGURE 40: Handicrafts⁴⁹



All the above use biodegradable material saving volumes of waste generated and replacing plastic products.

Forests and Mangrove

The forestry sector contributes to a significant portion of exports. The forests are a source of food, building materials and traditional medicines. Some of the issues in the forest sector are:

- Forest cover has substantially declined in the country
- Need to implement the regulations for commercial forests (Code of logging practice).
- Public-Private partnership for funding, and
- Proper Reforestation methodologies.

One of the initiatives of commercial forestry, is bamboo cultivation, this is a very good initiative. Figure 41 shows some of the possible products.

FIGURE 41: Bamboo House⁵⁰



Mangroves

Solomon Islands is one of the countries in the Pacific region with a fast-growing population, thus population pressure has driven the exploitation of mangrove resources, to meet the demands of mangrove firewood and building materials. This has also resulted in the clearing of mangroves for village expansion.⁵¹

FIGURE 42: Mangrove Forest Initiative⁵²



The images above show a fully-grown mangrove area, and a typical mangrove development initiative in the Solomon Islands.

Mangroves are vital habitats, which not only protect the coast against tsunamis, hurricanes/cyclones, and sea level change, but they directly benefit the adjacent reef by exporting life building carbon.

Mangroves, have an enormous capacity for storing up carbon dioxide and other greenhouse gases and trapping them in flooded soils for millennia. They are among the most carbon-rich tropical forests and can store twice as much carbon on a per-area basis as salt marshes.

Carbon capture and storage (CCS) is the process of capturing and storing carbon dioxide (CO₂) before it is released into the atmosphere.

Mangroves protect shorelines from damaging storm and hurricane winds, waves, and floods. Mangroves also help prevent erosion by stabilizing sediments with their tangled root systems. They maintain water quality and clarity, filtering pollutants and trapping sediments originating from land.

They are the nursery areas, for countless marine organisms. They provide natural adaptation to the effects of climate change and contribute to the reduction of pollution.

49 Photo credit: Yvonne Green, adapted from Wikimedia Commons, "Local handicraft at Art in the park, Honiara, Solomon Islands, 2012, Photo- Yvonne Green - DFAT (12784110254).jpg [https://commons.wikimedia.org/wiki/File:Local_handicraft_at_Art_in_the_Park,_Honiara,_Solomon_Islands,_2012_Photo-Yvonne_Green_-_DFAT_\(12784110254\).jpg](https://commons.wikimedia.org/wiki/File:Local_handicraft_at_Art_in_the_Park,_Honiara,_Solomon_Islands,_2012_Photo-Yvonne_Green_-_DFAT_(12784110254).jpg)

50 Source: Pinterest, adapted from Airnb.com, <https://www.pinterest.co.kr/pin/465911523924319522/>

51 Adapted from IUCN, "Mangrove Management in Solomon Islands: Case studies from Malaita Province", 2013, https://www.iucn.org/sites/dev/files/malaita_mangrove_management_policy_brief_solomon_islands.pdf

52 Photo credit Anne-Marie Schwarz, adapted from Flickr <https://www.flickr.com/photos/theworldfishcenter/6325348440>

ACTIVITY 4A (for all target groups)

1. What are some bad community practices, and how can you improve them?

Present	Proposed
Inefficient Cooking – leads to smoke – respiratory diseases	Use Energy Efficient Stove – Covered in Module 3 (Energy Efficiency Basics)
Water- Sources from river, stream, ground etc. Not clean and fit for drinking and cooking- water borne diseases	Use treated water for drinking
Throwing waste in the surrounding no proper segregation and dumping.	Segregate waste, have a proper landfill and recycle waste.
Agricultural waste – open burning in field- smoke	Proper disposal through recycling
Use of Kerosene lamps, candle – Poor quality of life, smoke	Shift to solar home systems- Elaborated in Renewable Energy Module

2. Please read the following statements and identify whether they are true or false?

Statement	True / False
Drinking Water directly from the well/ river is green	False
Segregation of waste is a green initiative	True
Petrol used for motorcycle is a clean source of energy	False
Use of Solar Energy is green	True
Use of firewood for cooking is good for health	False

3. Look at the figure below and name them

Figure	Answer
	Biomass pellet
	Biogas plant
	Fuel Efficient Stove
	Solar cooker

4. What is the feed material (input) to the biogas plant, and what do you do with the output?

The feed material to the biogas plant is kitchen waste, vegetable waste, animal waste. The output of the biogas plant is organic fertilizer.

ACTIVITY 4B

1. What are the present practices of water use in the community?

No piped water in most of the communities

Water is collected manually in trolleys, carrying on the head. Water often spills on the way. People trek long distances sometime uphill and spend substantial time to fetch water.

No mechanism to use rainwater.

Water from open wells often contaminated.

Proximity to low lying swamp and pit toilets make water unsafe for drinking

This water is directly used for all purposes (drinking, cooking, washing, and gardening)

Drinking unclean water can lead to water borne diseases and cooking.

Piped Water may not be clean.

The communities being cyclone prone, the water storage tanks fly off and the pipelines are broken.

Rainwater too murky and its untreated use leads to water borne diseases.

2. What is Rainwater harvesting?

This effectively catches the rainwater falling from the building and is collected in a tank as shown in Figure 19. There are communities where there is abundant rainfall, and access to alternative water is scarce. Rainwater harvesting can be used effectively in these communities.

3. How do you treat water for drinking?

Water is collected in the tank, filtered through a water filtration system and supplied through pipes in the community.

ACTIVITY 4C

1. What are the measures to make wealth, from waste?

- Seen as a new venture for persons with entrepreneurial aptitude
- To source funds from local lending institutions
- Send biodegradable waste to biogas plant (separately explained)
- Separate plastic, metal, paper, glass bottles.

- Glass bottles can be sold directly to the agent who will in turn sell to drinks produces (beer, coke, hard and soft drinks)
- Sell soft drink cans to the metal/paper to the recycler.
- Ensure the recycler uses ethical methods to recycle
- Avoid green washing concept
- Profitability depends on size of waste handled and the area covered.

2. Identify the waste from the figures and how will you recycle?

Figure	Recycle
	Vegetable waste. Used to make compost or biogas in a biogas plant.



Metal. Segregated, melted, and reused.



Plastics. Can be used to make recycled materials.

3. Name some of the recycled materials available in your country?

- Organic fertilizer used in agriculture (vanilla, Banana, turmeric and any other plant)
- Recycled paper
- Handicrafts (cutlery, artefacts, paper bags, wallets)

ACTIVITY 4D

1. What are the issues with Fisheries in your countries?

There is a significant scope for developing fisheries in terms of food security and economic development as the communities have large coast lines. There is huge potential for commercial fishing. There is a need to reduce post-harvest loss, develop cold storages and downstream fish processing industries. Further there are some unethical fishing activities, such as throwing plastics in the sea, river and cyanide dynamite. Beach de mer harvesting for fishing. This destroys marine life. There is also scope for development of in shore fishing (aquaculture, Mari culture).

2. Name some of the renewable energy gadgets that can be used in fisheries

- Solar fish drying – to dry fish
- Solar cold room
- Solar lights and fans in the fish selling store.

3. Name some initiatives for developing handicrafts

- Forming of cooperatives to give loan (money) to the artisans (NGOs and government can facilitate this).
- Help in sourcing quality raw material and also ensure quality of finished product.
- Ensure right price for the product.

4. Identify some of the issues in forestry sector in the countries

- Over felling of logs to export timber at current extraction rates.
- Forest cover has substantially declined in the country
- Need to implement the regulations for commercial forests. (Code of logging practice)
- Public-private partnership for funding
- Proper Reforestation methodologies

5. Why are preservation of mangroves important to the community?

Mangroves are vital habitats that not only protect the coast against tsunamis, hurricanes, and sea level change, but directly benefit the adjacent reef by exporting life building carbon. They are the nursery areas for countless marine organisms. They provide natural adaptation to the effects of climate change and contribute to the reduction of pollution.

5

Way Forward —————

5.1 Corporate Social Responsibility (CSR) Activities

Many of the green initiatives can be handled as Corporate Social Responsibility, this is also very good publicity tool for the various stake holders (financial institutions, NGOs, Missionaries).

- Beach Cleaning – once a month. Trash to be segregated, disposed and recycled as per above discussions.
- Paper recycled from the above can be made into notebooks and given to children.
- Fund low investment business initiatives (mobile charger/ corn roasting, packaging)
- Refrain from using child labour for financial purposes.

FIGURE 43: Corporate Social Responsibilities⁵³



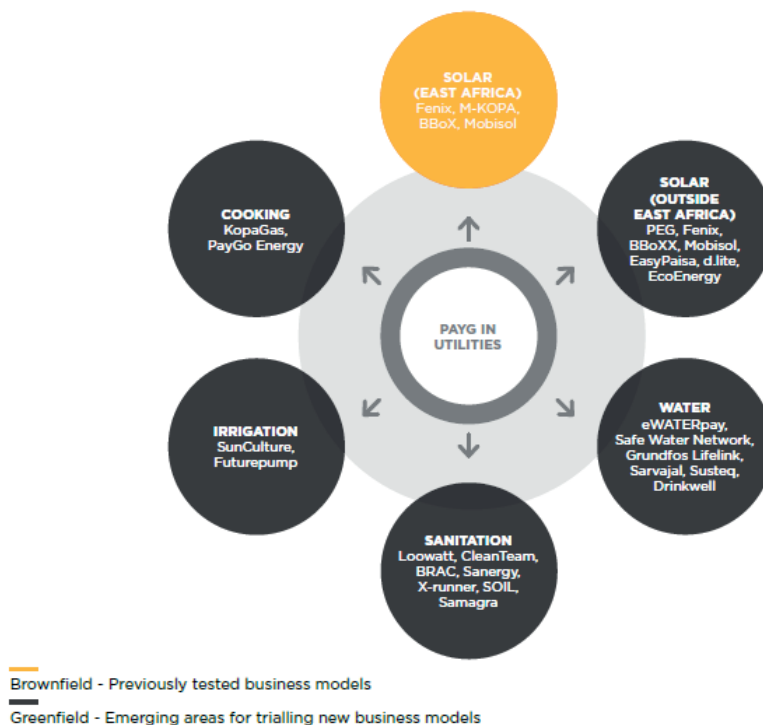
The following CSR activities will go a long way in greening the society.

5.2 Greener Options – Business Models

MONEY IS THE KEY ELEMENT- whether energy efficiency or green business, the community members will not be able to invest in many of the alternatives proposed- be it energy efficiency or green business. There needs to be innovative business models attractive enough to interest the community. Otherwise, this will end up as limited concept selling.

FIGURE 44: Financial Models⁵⁴

PAYG utility models in greenfield markets



Note: This list is neither representative nor exhaustive

⁵³ Source: Mangala, https://i2.wp.com/www.mangalaclothing.lk/wp-content/uploads/2020/05/my_01.jpg?resize=1024%2C412&ssl=1

⁵⁴ SMA Mobile for Development; <https://www.gsma.com/mobilefordevelopment/english/our-new-report-going-greenfield-with-pay-as-you-go>

PAYG-Pay as you go: PAYG (Figure 44) companies deploy various lease-to-own or direct pay-per-use business models. Through these services, they offer accessible and flexible payment plans to customers, including those that typically do not have credit histories or bank accounts. Suitable for expanding business of small vendors (mobile charging, waste segregation and collection, drinking water)

Leasing / Financial Institutions: Suitable for biomass pellets/ biogas /RO plants for drinking water.

Any business has an investor, project developer and implementer. They both work in tandem to be beneficial to the community.

This is only for basic information about the available avenues. Detailing is not a part of this exercise.

Establishing Green Business Steps – e.g., Waste Management – Step by Step Approach

- Form a team of community members say 3 to 4. Ensure representation of women in the community

- Identify waste collectors preferably from vulnerable groups (women/unemployed youth, single mothers)
- Find out the nearest waste buyer and disposal agent
- Enter into a price agreement with him (dollars/ kg of paper, cardboard, per bottle, per kg of iron etc.)
- Enter a payment term with the waste buyer - **income**
- Buy a weighing machine
- Enter a price arrangement with the waste collector- **expense**
- Separate the waste into biodegradable (vegetable and animal waste) and non-biodegradable (metal/paper).
- Have a compost plant for biodegradable. Sell the compost as fertilizer
- Sell the wastepaper / waste metal to the waste buyer
- Profit = Income- Expense
- Share the profits in the community

Bookkeeping Sample								
Date		Month						
Expenses	Received Paper		Received Metal					
	Kgs	dollars	Kgs	dollars				
Waste Collector 1								
Waste Collector 2								
Waste Collector 3								
Transport admin etc								
Income	Received Paper		Received Metal					
	Kgs	dollars	Kgs	dollars				
Profit	Income-expenses							

5.3 Green Jobs

Transition is a way towards a green economy and sustainable development that will create green jobs, support climate action and help combat social injustice. The Pacific islands region is an economically and culturally diverse area, sharing similar challenges and opportunities.

School curriculums offer an opportunity to create awareness on Green Business and Energy Efficiency Initiatives. Orienting the education in green economy will create more green jobs. The areas of opportunity are:

- Operation and Maintenance of Solar Systems (Electrical and Mechanical technicians and engineers)
- Operation and Maintenance of Pico hydro (Electrical and Mechanical technicians and engineers, Plumbers)
- Construction of Rainwater harvesting systems (civil and mechanical)
- Operation and maintenance of water supply systems (civil, mechanical and electrical)
- Waste Segregation and management (environmental)

The way the opportunities for the above are growing in the Pacific Islands and the countries covered in this programme requires a lot of awareness and training needs to be undertaken at various

levels. The other issue that needs to be addressed is to retain the trained manpower to stay and work in their countries. Otherwise, they may find greener pastures elsewhere.

The following has been considered and dropped keeping the community limitations:

- Ecotourism as this is separate subject by itself.
- Marine Pollution again to become a big subject.
- Higher level technologies for recycling waste
- Solar powered boats (still in development stage)
- Sanitation and hygiene as these are local government initiatives
- Forests and mangroves have been covered briefly.

To conclude, this part of the focus of this manual has been to understand and appreciate few green initiatives.

- Waste is a RESOURCE at a wrong place. Be innovative on resource recovery based on the above suited local community
- Energy is not LONG LASTING, be sensitive while using Energy. Conserve and Use Energy Efficient Equipment.

You are fortunate to live where Renewable Energy is abundant. Please use it effectively.

ACTIVITY 5

Target: Local government officials, Provincial Councils, District Councils, Town Councils, Island Councils, etc.

1. What is the role of your government in promotion of CSR activities?

- Meeting with various stake holders and request them to initiate activities.
- Inform the community about these activities and ensure their participation.
- Request stake holders to include vulnerable groups

2. What initiatives you would undertake to create green jobs?

- Identify Green jobs (solar, pumps, lights, boats, fisheries etc.)
- Assessment of Training Needs.
- Interact with various stake holders
- Monitor and implement.

Target: Traditional community/religious leaders, women, youth and vulnerable groups (single mothers, elderly), etc.

1. List some of the CSR activities you can undertake in the community

- Beach Cleaning – once a month. Trash to be segregated, disposed and recycled as per above.
- Paper recycled from the above can be made into notebooks and given to children.
- Fund low investment business initiatives (mobile charger/ corn roasting, packaging)
- Refrain from using child labour for financial purposes.

2. Name some green jobs that can be generated as part of renewable energy and green business initiatives?

- Operation and Maintenance of Solar Systems (Electrical and Mechanical technicians and engineers)
- Operation and Maintenance of Pico hydro (Electrical and Mechanical technicians and engineers, Plumbers)

- Construction of rainwater harvesting systems (civil and mechanical)
- Operation and maintenance of water supply systems (civil, mechanical and electrical)
- Waste Segregation and management (environmental)

Target: Local electricians, people with technical aptitude, etc.

1. How do you upgrade your skills?

- Look for training programs to develop skills in green jobs.
- Apply skills learnt in my work practices.
- Educate others when they join new.

Target: Small Businesses

1. Name of some CSR activities you would like to undertake as a part of green business initiative

- No plastics to be used in packaging
- Educate people for greener products

2. How would you keep your self-updated in green business?

- By interaction with experts/knowledge partners
- Participate in training.

Role Play 1

The members of the community are to then act out two role plays. For this role play, the learners may volunteer, or trainer can choose learners to act out certain roles. For this role play, 3 people are needed to play the characters Humprey, Mareta and Chris.

Humprey and Mareta live in one of the communities. Humprey works as a mechanic in the nearby town. Humprey cycles his way every day to work. Mareta uses a conventional wood stove for cooking. After Humprey leaves, every day Mareta spends about 2 hours to trek up the hill to fetch water. She takes care not to waste water. The family meet their lighting needs by a solar home lighting system.

On his way to work every day, Humprey sees a waste collection shop. Humprey saw stacks of paper waste, metal waste, empty bottles. Humprey is used to seeing waste thrown everywhere in his community. He therefore decides to stop on his way back at the store.

In the evening, he stops by at the store.

Humprey: Hello, I just wanted to know what is done in the shop

Chris: Hello, I am Chris, owner of this shop. I make money, by collecting and selling waste.

Humprey: How's that collecting waste!

Chris: Yes. I collect the vegetable waste and compost it and sell organic fertilizer. I sell the paper, to the recycler which makes cardboard boxes. The metal waste, I sell to metal recycling to be taken to the melting industry. He melts it into metal. Waste bottles, if they are not broken, I recycle it to the soft drink industry, breweries, and distilleries. They pay me. The plastic waste goes to plastics recycler.

Humprey: That sounds good. How do you get the waste?

Chris: I have waste collectors, who collect the waste and I separate the waste and pay them.

Humprey: I have enough waste lying around in our community. If I collect and give it to you, will you pay.

Chris: Yes of course. It can add to your income. There are waste collectors who get paid about 400 to 500 USD a month.

Humprey: Sounds Good! I will discuss with my community and get back.

Humprey drives back home with this thought!

Mareta: Hello, why are you late.

Humprey: I stopped at a waste store on the way and met the owner.

Mareta: Waste Store??? What does it mean??

Humprey: He collects waste from various houses and sells them to the recyclers. He pays the people who collect the waste for him. I am planning to do the same, for additional income. The additional income may help us to have a larger solar system, water tank to store water so that your trips to fetch water will be reduced. We can also have a system to collect rainwater.

Mareta: Yes, let's talk to the community this Sunday and then get started.

On Sunday, they talk to the community and Humprey educates the community on waste collection and recycle. He convinces the community to use bins to store waste. He said he will collect and give it to the recycler. He also tells them the money he earns will be shared 50:50.

Next day on his way back he stops at the waste shop.

Humprey: Hello Chris

Chris: Hello Humprey. Nice to see you back. Hoping you will contribute to making your community green.

Humprey: Yes. I convinced the community. I shall collect waste and bring it to you. You can pay me.

Chris: Yes. I suggest you get the waste twice a week. We will keep an account, and I will pay you monthly. I also suggest you keep the vegetable waste in the community. I will help you with composting, to be used as fertilizer.

Humprey: Thanks, will be on the job.

So, saying, Humprey starts collecting the waste, separates the waste and takes it to the waste seller. As per discussion Chris paid Humprey regularly. He also helped Humprey with composting. The organic manure from the composting was shared by the community for use in their fields.

After one-year Humprey noted that he made about 600 USD. He shared the money with others. With the balance he invested on a larger solar system. He has enough light, solar fridge and TV. He is planning to invest on a water system next year.

Not only Humprey and Mareta were happy, but the entire community. The community experienced a better quality of life.

Role Play 2

In this role play, 3 learners are needed to play the roles of the old lady, Meli and Ken.

In the rural community of Lawa, a group of children are playing in the school playground and having a conversation

Meli: Ken, have you seen that old lady who walks around the village very early every morning, picking up rubbish?

Ken: Yes, Meli – I thought she was a bit weird at first but every morning I watch her, and she has a few different rubbish bags – one for the glass bottles, one for the plastic bottles and one as well for the disposable rubbish. I really admire her commitment to keeping the village clean.

Meli: Interesting – I have always wanted to learn more about her – thanks for telling me what she does – does she get paid for doing it?

Ken: I hear she takes the waste she collects to town, and she gets some money for it – she uses the money for her grandchildren. I hear their parents have both passed, so she has to look after them.

Meli: That is such a sad story – I think I will wake up early tomorrow morning and offer to help her.

Early the next morning, Meli meets the old lady as she is picking up rubbish,

Old lady: Good morning young man – what are you doing up so early?

Meli: I have been waiting for you – I wanted to help you and learn more about what you are doing with this rubbish.

Old Lady: A few years ago, I heard about the concept of Reduce, Reuse and Recycle from my daughter before she passed away. She made me promise to do my best to look after her children and also the environment. She was a strong advocate for looking after the environment. That is why I continue to do this until this day.

Meli: That is such an amazing story – I will make a point to do the same as well, so I can do my bit to protect the environment.

Old Lady: And you can make some money as well – so I would encourage you to do it and show your friends how it's done, so we can start to create an environment which values the concept of the 3 R's



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