

EU-GIZ Adaptation to Climate Change and Sustainable Energy (EU-GIZ ACSE)  
Fiji Sustainable Energy Hybrid Power Project (FSEHPP)

Energy Use, Concerns, Opportunities and Needs  
Regarding the planned Solar Hybrid System:

Results from a Gender-Inclusive Consultation  
in Nakoro Village

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**Background**

in 2010, Nakoro village in Navosa, Fiji, had sent a request to the Department of Energy for a Solar Hybrid System. In 2014/2015, a project plan was developed and funding from the EU-GIZ Adaptation to Climate Change and Sustainable Energy (EU-GIZ ACSE) Programme was applied for. In 2016, funding was secured and a system design was drafted.

The Department of Energy conducted a load survey in the village on December 7<sup>th</sup> -8<sup>th</sup> 2017. To ensure that the needs of women and youth are considered in the design of the system and the further implementation of the project, this was accompanied by a gender inclusive consultation that focused on current and expected energy use, risks and opportunities with the new system, and requirements to its design.

**Methodology**

The gender inclusive consultation was conducted in the form of a talanoa dialogue with three focus groups (chief and community, women, youth). To allow for comparability between the groups, a standardized set of questions was created in advance. Details on the current setup and energy use were collected from participative observation during the load survey.

The result is a thorough overview of current energy use in the village that can be used to inform the project baseline and the capacity planning of the new system. Furthermore, the answers from the focus groups help to achieve a gender-sensitive understanding of the needs, expectations, concerns and opportunities with regards to the new system, and how it may interact with daily life in the village.

Results from the consultation are well suited to inform the design of the system as well as the further implementation and evaluation of the project.

## **Quick Facts on Energy Use**

**Residents:**100+

**Households:** 48

### **Energy Sources:**

- Renewable:
  - Portable Solar Lanterns / Chargers 'greenlight panel' for light (2-3 per household)
  - 3 Solar Panel Roof Systems (3x300 W; 2x300 W; 2 x 300 W) with inverters on chief and Matagali households
  - 1 Solar Panel System (2 x 125 W) for landline (owned by phone company)
  - Firewood (used by everyone)
  - Cottonseed Oil (used in one of the mini-generators)
- Non-renewable:
  - 20 Kerosene stoves
  - 4 Gas stoves
  - 10 mini diesel generators (900 Watt 'Yamaha ET900')
  - Diesel Oil: about 20 l per month from about 50-100 FJD per truck at a price of 1,08 FJD / liter (according to acting Turanikoro)

### **Appliances:**

- 4 gas stoves
- 3 washing machines
- 3 refrigerators
- 5 televisions

### **Other amenities:**

- 4 Telcom Fiji Limited (TFL) landlines
- All residents have mobile phone access

## **Summary of the Focus Group Consultations (x participants)**

### **How is energy currently used in the village?**

All residents use firewood (lobo) for daily cooking. In approximately 20 households, there are kerosene stoves that are also used for cooking, and 4 gas stoves that are used for baking on occasion. There are 10 households with portable diesel generators used to power electrical tools and to occasionally provide lighting and power televisions. Solar panel systems with inverters can be found on three houses where fridges and washing machines can be found in addition to televisions. The fridges are used to store food and to produce ice blocks for sale within the village. All households contain 2-3 portable solar chargers with a battery and lights that is used for indoor lighting, charging of phones and occasionally Bluetooth speakers.

### **How will electricity be used once installed?**

Women showed interest in getting kettles, irons and other appliances to make domestic duties easier. The youth mentioned getting appliances such as washing machines, microwaves, electric fryers and kettles to provide more recreation time. Persons were generally interested in getting television sets.

### **What are the risks or concerns associated with introducing electricity to this village?**

The village chief made reference to a village where electricity was recently introduced where men became complacent and neglected farm duties to watch television. Women shared a similar concern and how this could result in domestic conflicts. The women also mentioned that persons (particularly youth) would invest in stereo systems and play loudly, causing a nuisance to the village and disregard pleas of the elders to reduce the volume and ultimately, social disputes. The youth expressed concern about electrical fires and shock that may result from the introduction of the new technology.

### **Are there any proposed solutions to these risks?**

Residents suggested holding a village meeting to agree on designated televisions viewing times to be enforced by the chief and the solar committee.

As it related to the hazards of electricity, training was requested with residents on how to safely utilize electricity.

### **What opportunities, for income generation or otherwise, exist with the introduction of electricity?**

The men were interested in purchasing electrical tools such as drills and saws to pursue carpentry and other crafts. Currently, there are two carpenters and 1 engineer in the village.

The women's group indicated interest in opening a village shop with a refrigerator for frozen goods. They have planned to start breeding chickens and intend to use electricity for heating and lighting in the hatchery. The women mentioned also, that electricity can allow for other income generating skills to be further explored, such as buying sewing machines to make sulu jaba, and using light to be able to weave mats and design bedsheets and pillow cases at night for sale.

The youth mentioned that electricity would allow for a freezer to be purchased which can be used to store roots crops. Roots crops are currently produced for village consumption, but freezer storage will enable commercial production through extended shelf life. An additional income generating interest of the youth was the purchasing of a billiard table.

The village has plans to build a community centre. Once constructed, the villagers have planned to purchase a computer which will be equipped with internet access (via the existing TFL connection) to be used by the residents, for a cost.

The children of schooling age in the village attend boarding school and return home on weekends. Having electricity is expected to provide them with the ability to study later into the night and improve their overall performance.

#### **What will be the main change to the village after electricity is introduced?**

The women did not respond to that question.

The youth suggested that access to computers and the internet will help the villagers to remain informed on local and international events and will ultimately change their mindsets and general thinking positively.

#### **What needs to be considered in the design of the system?**

The villagers requested approximately 10 streetlights to be placed along the roads, near the church and the site for the community hall. Women and youth specifically requested that streetlights are placed at the loading area where the vehicle is loaded for the market in the early morning hours to prevent items from being forgotten. The women also requested that lights be placed at the roundabout for safe storage of shopping items upon returning from Sigatoka before being transferred to their houses. The youth requested that 2-4 streetlights be placed around the playing field to allow for training and general leisure.

At a domestic level, the women and youth suggested that lights and outlets be focussed primarily in kitchen and sitting room areas, as that is where most family events take place. The youth also mentioned placing lights outside the house to improve general visibility at night.

## Transcripts of Consultations

### Village Talanoa with Chief

*Timo Baur led the general discussion, after an introduction by Gabor Sasvari and representatives from Department of Energy*

*TB: What type of energy is currently used in the village?*

Firewood (lobo) is the most popular for cooking (approximately 80% of cooking). Gas stove is used for baking.

There are approximately 10 portable generators powered by diesel premix. They are used to charge phones and power the TV in the village. There are currently no computers. There are 4 landlines but everybody has mobile phone access. Solar chargers are used to charge the phones and provide light with 2-3 solar chargers per house.

*TB: How many people are in the village?*

Over 100 persons (exact figure and other demographics to come), in a total of 48 households. 10/48 or ~20% of houses use generator. 100% solar chargers and lights. Generator is used for TV and washing machines for 2-3 hours at a time. There are 3 fridges, 1 washing machine and 1 TV in the village. No water heaters or kettles.

*TB: How will electricity be used in the future?*

Set up retail shop using a fridge or 2. 1 TV and washing machine per house. Mat weaving currently practiced during the day; with electricity it can be done at night as well. Manual sewing machines currently used. Electrical machines can be used to make sulu jaba and other items. Women interested in getting appliances such as kettles, irons. Might be 1 big heater for houses.

*DoE Rep: approx. 200-300 watts allotted per house*

*GS explain to residents that electricity comes with a cost and so the more they want, the more they will pay.*

*TB: Do you have any concerns about how electricity will change village life?*

Chief: People in another village with a similar electricity system started to stay home and watch TV or sleep instead of going to the farm. But electricity will be good for children for studying at night and early morning, and to prepare food for school.

*TB gave personal example about the breaking of social bonds when each person gets their own TV and not come together anymore; but also highlighted the benefits of better health care, education through computers.*

Potential solution suggested by the chief is to designate a time for TV and to monitor households to ensure compliance. In the other village, TV is shut off at 9pm; something similar will be employed here.

*GS emphasized hazards associated with electricity such as shocks and that energy and electricity safety should be taught to residents.*

*DoE: training will be conducted once installation starts.*

*TB: Do you have any ideas for the design of the system?*

10 streetlights requested along the road, near the church and community hall.

New houses to come.

*TB: Any income generating activities that can be pursued with electricity?*

Shop-fridge

Electric sewing machine

Electric tools for carpentry

*TB suggests computer 'lab' set up for access to online education - residents seem keen.*

### **Women's Focus Group (4 participants)**

*MA led the focus group.*

1. What fuel is currently being used?

Firewood for cooking- used by everybody

Kerosene stove for cooking – approximately 20 kerosene stoves

Gas stove used by some- currently 4 gas stoves

Portable solar lighting used by everyone

3 houses have solar panels with inverters to power washing machines (3) and fridges (3) used to sell ice blocks.

5 diesel generators used to provide lighting and power TVs (5)

2. How will electricity be used?

Women's group would like to buy fridge to set up shop with frozen foods.

Sewing machines to be bought for income generation to cover bills.

Women's group want to start breeding chickens- electricity to provide heat and light

3. Risks and Concerns associated with electricity.

Persons would want to buy stereos and play loudly and will not respect elders when asked to turn them down, resulting in segregation.

More time spent on TV and reluctance to go to the farm resulting in family fighting and problems. Husbands don't want to go to the farm, wives become unhappy and quarrel.

A potential solution would be to have a meeting to set time for TV, for example, don't allow TV in the morning and after 9pm.

4. What opportunities would electricity provide?

Children in boarding school come home Friday-Sunday. Electricity allows them to study more, do homework and improve performance.

5. What are the income generating activities that you plan to adopt?

Shop with frozen foods

Chick breeding

Sewing

Mat weaving at night

Women's group currently design fabric on pillowcases and bedsheets for village use. It can be produced for commercial purposes at night with light.

6. What significant changes do you expect?

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7. System design- village wide and domestic

Streetlights in loading area for market which is done early in the morning when it is still dark so items get left behind.

Streetlight in roundabout area since they store items there when coming from shopping before children come to collect.

Domestically, outlets requested in kitchen for cooking and sitting room where most time is spent and family functions occur.

Additionally, there is telecom connectivity, therefore internet access will be possible. Currently there are 4 landlines in the village.

END OF DISCUSSION

## **Youth Focus Group (x participants)**

*MA led the focus group.*

1. What fuel is currently being used?  
Firewood for cooking while camping on farms. Farms 3 hours walk from village.
2. How will electricity be used?  
Washing machines to help since most are bachelors/ single. Will help with multitasking.  
Appliances to help with cooking as well, such as electric frying pan, microwave, kettles.
3. Risks and Concerns associated with electricity.  
Electrical fires and faults since current generator electricity exposure is only for 4 hours max at a time.  
Staying home instead of going to the farm.
4. What opportunities would electricity provide and what are the income generating activities that you plan to adopt?  
Set up a business with a billiard table to pay bills  
Freezer to store dalo and cassava for sale. Currently root crops produced for village consumption.
5. What significant changes do you expect?  
Computer access to stay informed on news and other local and global events.  
Change mindset and how they perceive things.
6. System design- village wide and domestic  
Street lights: in loading areas; 2-4 lights around playing field for training and recreation  
Outlets: kitchen and sitting room. Also outside to improve visibility.

Youth had questions about the solar hybrid system.

END OF DISCUSSION