



Contributing to poverty Alleviation through Regional Energy Planning in Indonesia

Work Package 2

Identification of Energy-related Needs and Priorities of Poor Communities in Teres Genit, West Nusa Tenggara



CAREPI Team West Nusa Tenggara



Intelligent Energy



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Chapter 1

Description of Teres Genit Village

1.1 Demography

Teres Genit is a village in Bayan District, North Lombok Regency, in West Nusa Tenggara Province. Villages surrounding Teres Genit are Anyar in the north, Senaru in the west, Loloan in the east, and in the south is a conservation forest. Teres Genit is selected for this study because the location is not connected to PLN's grid and Teres Genit classified as poor community.

Teres Genit is located about 90 km from Mataram, as the capitol of West Nusa Tenggara. This location can be reached by motorcycle, car, or bus in 2.5 – 3 hours.

Table 1. Route and Road Condition to Teres Genit

Route	Distance	Duration	Available transportation	Road Type
Mataram - Bayan District	81 km	2 hour	Bus	Asphalted
Bayan District - Bayan village	2 km	5 minute	Bus	Asphalted
Bayan village - MHP Scheme	7 km	45 minute	Motorcycle	Not Asphalted

The settlement in Teres Genit is quite concentrated. The distance between one house to the other house of is very close. From survey that is conducted in this study to the three sub-villages, the household number are 510 units, and the estimated number of population is 1785 people. The details are in the Table 2 as follows.

Table 2. Number of households in each Sub-Villages of Teres Genit

No	Sub-villages	Coordinate		Number of household
		Longitude	Latitude	
1.	Dasan Tutul	8 ⁰ 18' 11,2''	116 ⁰ 25' 24,9''	116
2.	Nangka Rempek	8 ⁰ 18' 11,1''	116 ⁰ 25' 24,5''	207
3.	Teres Genit	8 ⁰ 17' 47''	116 ⁰ 25' 27,4''	167

1.2 Economic Condition

Teres Genit people rely on agriculture and plantation sectors. However, production facilities are still insufficient; such as storage facility and rice mill.

Table 3. Occupation of Teres Genit People

Occupation	Number of Household (KK)	Number of employee	Woman participant
Farmers	139	278	85
Trader	5		
Worker	324	1296	750
Carpenter	7	7	
Civil Servant	1	1	
International Migrant	34	34	
Total	510	1616	855

The number of unemployment is 10%, and the illiterate people are 65% of the population. The percentage of household who have high, middle, and low economically income is 10%, 25%, and 65% respectively (source: Head of Village). The average income per household is Rp. 350.000,- per month, and the average expenses per household for lighting is Rp. 35.400,- per month (based on survey).



1.3 Energy Consumption

Based on survey conducted in this study, energy utilization in Teres Genit (before microhydro implemented) is as follows.

- kerosene for lighting
- Wood and kerosene for cooking and water heating
- charcoal for ironing.
- Gasoline for fuelled generator for carpentering
- Gasoline and Automotive Diesel Oil for motorcycle and car.

After implementation of microhydro in Teres Genit, the people has a better choice of energy to use. The electricity produced from microhydro mainly used for lighting. Microhydro in Teres Genit operate from 17.00 to 13.00 or 20 hours per day on working day (Monday to Saturday), and from 17.00 to 05.00 or 12 hours on Sunday. Total capacity of microhydro plant in Teres Genit is 30 kW. Currently, the plant utilization is around 17 – 18 kW.

The other prospective energy that can be utilized in Teres Genit is biogas energy from cow's waste. Most of household in Teres Genit have cow for ploughing their paddy field. The cow's waste can be processed to be biogas to replace kerosene and wood for cooking.

Chapter 2

Energy-Related Needs and Priorities

Teres Genit is one of non electrified village in West Nusa Tenggara. People in Teres Genit use kerosene, diesel, gasoline and local energy such as wood. They collect wood in surrounding village, but they should pay relatively expensive for oil fuel. To provide better energy service in Teres Genit, some local energy sources that can be developed are microhydro and biogas.

Microhydro utilization in Teres Genit has not only replaced kerosene for lighting, but also give possibility for the people to have electronics appliances, such as TV, radio, fan, etc. For productive usage, electricity is used for ice making, rice mill, wood carpentering, and others.

The upcoming of the electric energy to the community of Teres Genit isn't a meaning of problem that related to the energy that has been solved. The energy is very limited for fulfil the need of all energy for the community, so it needs to find other alternative energy, i.e. for cooking and warming water when formerly used to the energy of fire wood and moves to utilize biogas from cow's waste. This point is supporting by an issue of global warming, that means utilize of fire wood as source energy lately should be decrease.

The other energy problem is how to provide energy for cooking. Currently, the people use wood for cooking that is collected from their yard or from neighbouring forest. To solve this problem, it can be developed biogas digester from cow waste.

Following are some measures related to energy service that can be done in Teres Genit.

1. Provide energy service for the people to support their daily life.
2. Optimize the utilization of electricity for productive use.
3. Develop biogas from cow waste for cooking and water heating.

To increase Teres Genit people’s income, some productive use of electricity can be implemented, as shown in Table 4.

Table 4. Productive Use of Microhydro in Teres Genit

No.	Type of productive use	Supporting factor	Technology/operational
1.	Rice Milling Unit	<ul style="list-style-type: none"> • Main source of income • Community culture • 2 time harvest a year • Close to community house • Source of main food 	<ul style="list-style-type: none"> • Machine under 7 PK • Just daytime operation • Need special supervisor
2.	Coconut Oil Production	<ul style="list-style-type: none"> • Available of Productive Coconut tree • Daily coconut oil consumption by local community (increase significantly in Maulid holiday) • Cost efficient 	<ul style="list-style-type: none"> • Machine 450 watt (individual or group) • Mixer 450 watt • Daytime operation
3.	Carpenter	<ul style="list-style-type: none"> • Job Opportunity • Conserve local culture • Innovative work • Local use product • Availability of local skill 	<ul style="list-style-type: none"> • Available 11 unit machine/genset for carpenter @ 0,5-1,2 kW use of petrol. • Need of electrical machine for carpenter: Jigsaw, Polisher, etc • Daytime operation
	Fertilizer/Compos	<ul style="list-style-type: none"> • Availability of Rice waste • Need by farmer • Job/productive activity opportunity • Availability of Cattle waste 	<ul style="list-style-type: none"> • Need small and medium size of mixer • Daytime operation
	Rice, Coffee and Corn Processing	<ul style="list-style-type: none"> • Local consumption • <i>Guest house</i> operating by T&R • Cost Efficient • HH scale production 	<ul style="list-style-type: none"> • Processor machine 450 watt • Collective or individual



No.	Type of productive use	Supporting factor	Technology/operational
	Food for Fish	<ul style="list-style-type: none"> • Job and Productive activity opportunity • Availability of T&R quest house and restaurant • Stable price of local fish • Availability source of material 	<ul style="list-style-type: none"> • Mixer • Daytime operation
	Knitting	<ul style="list-style-type: none"> • Needed by community • Cost effective • New activity opportunity • HH Scale activity in daytime 	<ul style="list-style-type: none"> • Electric Knitting machine
	Community Radio Transmission	<ul style="list-style-type: none"> • Needed by village community (in Senaru already exist RAKOM); • Technological and knowledge transformation; • Local communication media 	<ul style="list-style-type: none"> • Day-night operation



Chapter 3

Conclusions and Recommendations

Teres Genit is a village that is chosen as study case for poverty alleviation through providing energy service. Teres Genit has some energy potential that can be developed, that are hydro power and biogas from cow waste. Currently, through the assistance of this project (CAREPI) and funding from government, a microhydro with capacity of 30 kW has already built in Teres Genit. The electricity produced from this microhydro is mainly used for consumptive use.

It is recommended to develop biogas digester from cow waste in Teres Genit. Utilization of biogas can replace kerosene and wood for cooking and water heating. This will give the people saving their expenditure because kerosene is relatively expensive for the people. It will also support the forest conservation, that also means supporting the sustainability of water flow for microhydro operation.

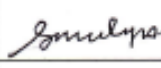
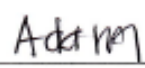
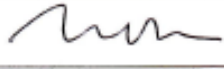
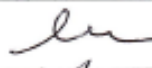

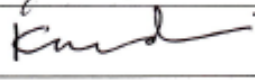
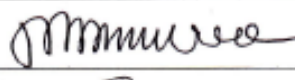
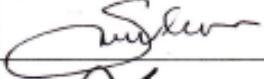

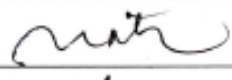
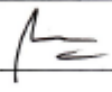
Productive use of electricity in Teres Genit should be encouraged. Currently, the usage of microhydro capacity is only less that two-third of the total capacity. Training and socialization of productive use of electricity should be carried out.

ANNEXES

Annex A. Attendance List of Meeting in Teres Genit

Daftar Hadir Pertemuan Masyarakat Dusun Teres Genit

Minggu, 11/02/2007

No	Nama	Tanda Tangan
	Salip	
	Adam.	
	Nuradi	
	M. ILHAM	
	Ratmasi	
	Kardi	
	Manawanggyn	
	Sukarna	
	AGUNG BUDI MULJONO	
	Abdul Natm	
	Rasmaliofi	

Kepala Dusun Teres Genit


 (Subrati)

Annex B. Pictures of Teres Genit Village



Figure 1. Housing in Teres Genit



Figure 2. Discussion with Teres Genit Representatives



Figure 3. Discussion with Teres Genit Representatives



Figure 4. Main Activity of Teres Genit People



Figure 5. Productive Use of Electricity in Teres Genit



Figure 6. Microhydro Plant in Teres Genit



Figure 7. Socialization of Microhydro Utilization in Teres Genit



Annex C Proposed Budget of Productive Use in Teres Genit

No	Activity	Unit	Time (day)	Vol.	Price	Total
1.	Socio Economic Survey					11.750.000
	Transport team	Man-day	2	5	500.000	5.000.000
	Meal	Package	6	5	25.000	750.000
	Form survey	Package	2	1	250.000	500.000
	Communication	Package	1	1	500.000	500.000
	Wage	Man-day	2	5	500.000	5.000.000
2.	Analysis					16.750.000
	Meeting facilities	Kali	10	5	25.000	1.250.000
	Consumables	Package	1	1	500.000	500.000
	Wage	Man-meeting	10	5	250.000	12.500.000
	Rent for computer, printer	package	10	1	250.000	2.500.000
	Materi dan bahan diskusi	package	10	1	150.000	1.500.000
3.	Training					12.050.000
	Transport for instructor	Man-day	2	2	500.000	2.000.000
	Transport for team	Man-day	2	5	500.000	5.000.000
	Fee for instructor	Man-day	2	2	50.000	200.000
	Meeting facilities	kali	2	57	25.000	2.850.000
	Rent for room	package	2	1	500.000	1.000.000
	Training material	package	2	1	500.000	1.000.000
4.	Product development					10.950.000
	Transport for Instructor/team	Man-day	2	5	500.000	5.000.000
	Fee for Instruktur	Man-day	2	2	500.000	2.000.000
	Meeting facilities	package	2	5	25.000	250.000
	Rent for room	package	2	1	500.000	1.000.000
	Training material	package	2	1	100.000	200.000
	Meeting facilities	package	2	50	25.000	2.500.000
5.	Implementation of Biogas Digester					30.520.000
	Build stable for cow	package	1	1	11.240.000	11.240.000
	Build biogas digester	package	1	1	7.800.000	7.800.000
	Gas network	package	1	1	1.100.000	1.100.000
	Stove and bottle	package	1	1	2.380.000	2.380.000
	Foreman	package	1	1	5.000.000	5.000.000
	O&Mtraining	package	1	2	1.500.000	3.000.000
6.	Monitoring & Evaluation					9.250.000
	Transport for Team	kali	2	5	500.000	5.000.000
	Meal	package	2	5	25.000	250.000
	Reporting and documentation	package	2	1	2.000.000	4.000.000