

Innovative DC grid for improving the quality of life of rural area in Cambodia

Mini-workshop on rural electrification research in JASTIP-net

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A bit about history...

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Study on the impacts in villagers' lifestyle and economic condition "**before and after**" their electrification by SHSs (2016-)

- *Comparison between different RE implementation schemes and region, countries*
- *The external condition, access to the city, development of local industries and so on.*

⇒ *to get a **clear information** on the impacts of electrification by SHSs*

Finally:

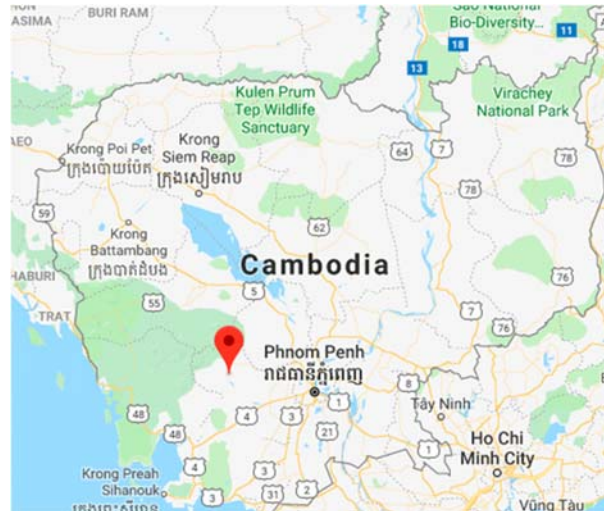
⇒ *Develop suitable hardware and software for rural community and policy assessment*



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Site information

- Location: Prey Thom Village, Reasmei Samky Commune, Oral District, Kompong Speu Province
- Villages consisted of 6 block, total around 435 families with 2,097 of population (> 1,118 females).
- All those Households got solar lanterns in **around 2014**
- Donor : Panasonic CSR
- Local collaborative organization : Life With Dignity (LWD)
 - Maintain and instruction



Questionnaire

Wisconsin QOL indicators (M.A. Becker, 2014)

- General Satisfaction Level,
- Activities and Occupations,
- Psychological Well-Being,
- Symptoms/Outlook,
- Physical Health,
- Social Relations/Support,
- Money,
- Activities of Daily Living,
- Goal Attainment.



Energy consumption

- Electricity appliances
- Daily activity pattern
- Cooking method

External conditions

- Transportations
- Schools
- Hospitals

Result (background information)

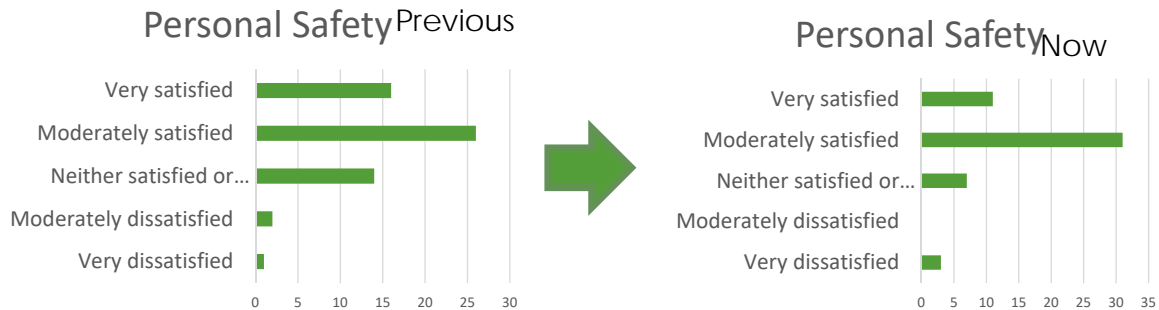
- 59 villagers (families)
- Age : 20-40: 25, >40: 34, male: 11, female: 48
- Education: None: 25, Primary: 32, junior or hi-school :2
- Occupation: Farming: 34, Paid work: 4, Housewife: 21



General Satisfaction Level



Personal Security

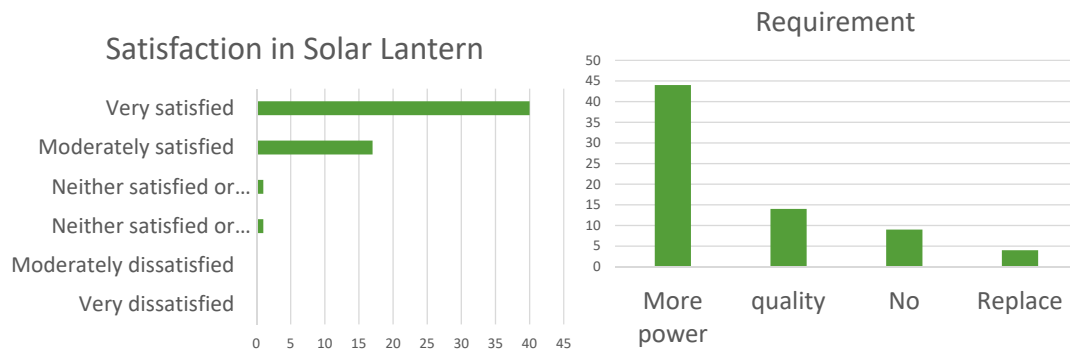


Very satisfied: decreased
 Moderately satisfied: increased

71% satisfied (seems improved)



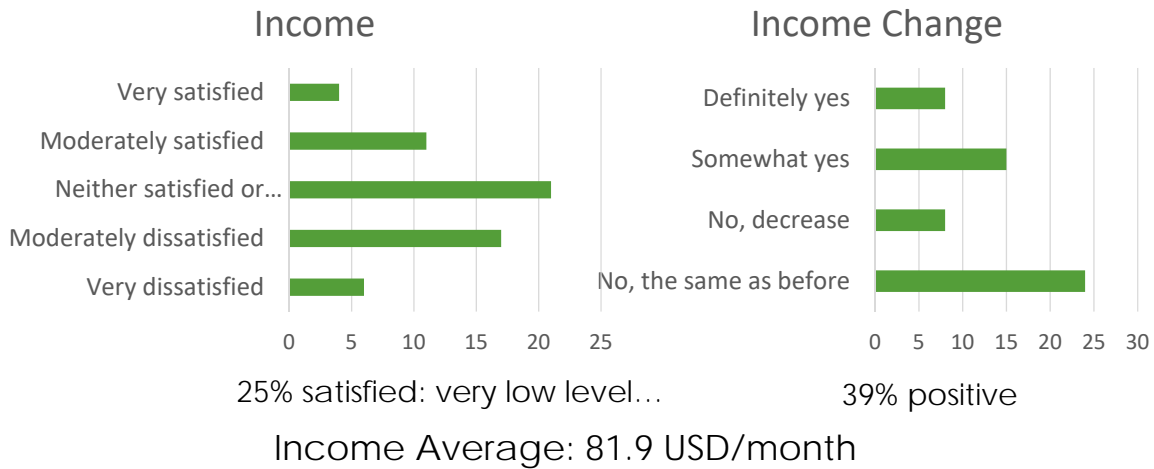
Satisfaction of solar lantern and requirement



92% satisfied

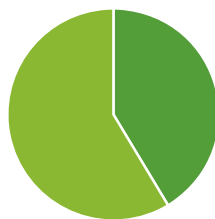


Income



Daily Pattern and willing for investment

Change the living pattern?



■ Never ■ Yes

Not so much changed by solar lantern, because they had some kind of lights (i.e. battery charging system) .

Willing to pay for new investment (USD/month)



■ <1 ■ >=1,<5 ■ >=5,<10 ■ >=10

They want more power, but no money and willing.



Brief conclusion

- Interview session for Prey Thom village which got solar lantern system in a few years before.
- Low educated and (still) very low income level
- The general satisfaction level became improved (14% up) than before.
- The personal safety level also became better.
- Their incomes slightly increased, but still low satisfaction level
- Villagers satisfied solar lantern system and wishing to increase PV power
 - We observed several houses put additional PV panel or changed original panel to large ones.
 - A few solar lantern system have been broken.

Needs of more power

Some villagers installed additional PV panel(s)



They use hand pumped underground water for drinking.
=> Solar pumping system might be useful for them; also for irrigation.

The facts...

- Low power consumption of households
- Grid extension is costly and takes time
- Mismatch between solar production and consumption
- Common loads like water pump exist
- Other electrical loads for income-generation activities might exist
- Willingness to pay

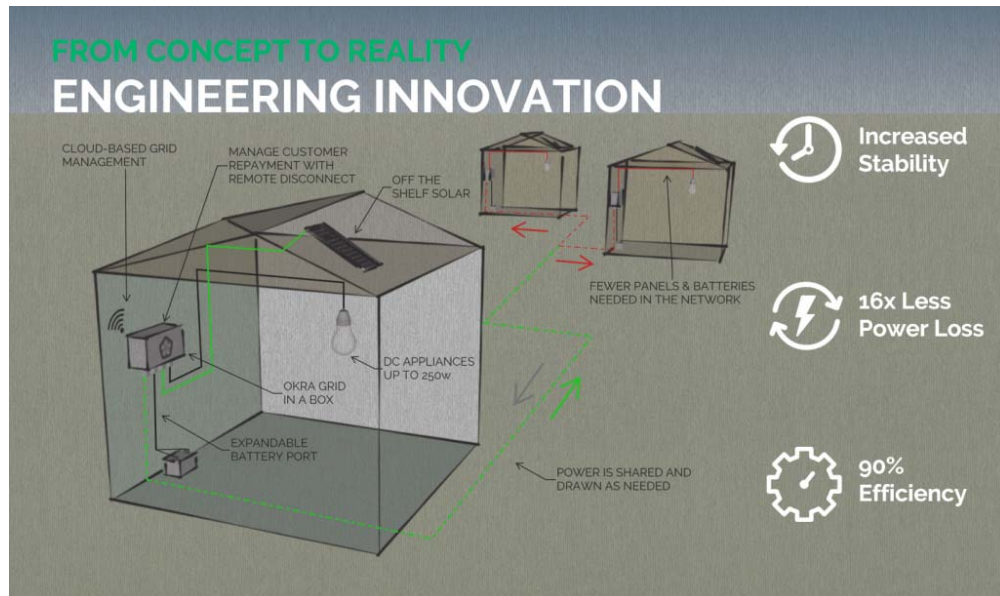
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Conceptualize things...

- Stand-alone or grid
- DC or AC grid
- Storage or no storage
- International and local standards
- Go beyond households (health center, school etc.)
- Efficiency and stability
- Operation and maintenance
- Investment options, business model

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One example of existing solution in Cambodia



Thank You