Gender, Modern Biomass Energy Technology & Poverty: Case Study in Sri Lanka

Prof. Anoja Wickramasinghe
Dept. of Geography
University of Peradeniya
Peradeniya, SRI LANKA

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Energy Sector

Key Features
- Biomass provides 50% of primary energy;
- Annual Consumption is 10 million tones;
- Monitory value is US$440 million;
- Household sector consumes nearly 81%;
- Petroleum provides 42% of primary energy;
- Hydro power contribute 8%.

National Energy Policy?

Ministry of Irrigation, Power and Energy indicated following areas:
- Providing basic energy needs;
- Reducing dependence on imported energy and diversifying energy sources;
- Optimum mix of energy sources;
- Optimization of the use of available sources;
- Energy conservation;
- Forest and non-forest woodfuel resources;
- Appropriate pricing policy & price stability;
- Continuity of energy supply;
- Capabilities to manage energy sector.
Trends in Energy Sector

- Rural electrification;
- Decentralization;
- Renewable energy;
- New partnership;
- Dendro-energy development;
  - To generate 1800 Mw of electricity from biomass;
  - Two modes are used – electricity for national grid and electricity for off-grid supply.

Growing Our Own Energy

Fuel Wood Collection/Transport
Growing Our Own Energy

Anything that burns gives off Carbon Dioxide

But now we have the trees to absorb it

The trees return oxygen to the air
Carbon is stored in the trees
Nitrogen in the soil

And when the sun goes down
Growing Our Own Energy

Focus – Key Research Questions

- Do gender relations constitute a key variable in designing dendro-energy intervention & contribute to achieving the goals of interventions?
- Does dendro-energy intervention most effectively contribute to the process of improving the wellbeing & empowering women and how can it best do this?
Methodology

Combination of methods were used:

- Participatory methods;
- Field measurements and observations;
- Ethnographic records;
- Questionnaire survey;
- Field mapping.
### Location of Study Areas

![Location of Study Areas](image)

### Typology of situations covered in this study

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Kumbalgamuwa</th>
<th>Wadakahakiwla</th>
<th>Hapuwala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy intervention</td>
<td>Project on dendro-energy for rational grid</td>
<td>Project on dendro-energy for off-grid</td>
<td>No project – biomass for local use</td>
</tr>
<tr>
<td>Mode</td>
<td>Private sector energy entrepreneur</td>
<td>Community-level organization</td>
<td>Traditional (household-based)</td>
</tr>
<tr>
<td>Partnership</td>
<td>State agency, private sector, local suppliers, local feedstock producers</td>
<td>NGOs, community organization, local producers supplying feedstock</td>
<td>Individual household responsibility</td>
</tr>
<tr>
<td>Decisions</td>
<td>Energy entrepreneur and supplier</td>
<td>Community organization</td>
<td>Household - women in particular</td>
</tr>
<tr>
<td></td>
<td>Dendro-power, Electricity consumer society and NGOs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>Externally introduced, Raw biomass for modern-clean (electricity) power generation, Combustion in cooking</td>
<td>Externally introduced, Raw biomass for modern-clean (electricity) power generation, and raw Combustion in cooking</td>
<td>Locally evolved, Raw biomass combustion in cooking.</td>
</tr>
<tr>
<td>Operation</td>
<td>Private management</td>
<td>Community management</td>
<td>Household/women</td>
</tr>
<tr>
<td>Output</td>
<td>Electricity for the national grid</td>
<td>Electricity for lighting, community-use</td>
<td>Biomass combustion for cooking</td>
</tr>
</tbody>
</table>
Dendro-energy Development for National Grid - Kumbalgamuwa

Key Features:
- Total number of households – 1165 in 7 villages;
- Study covered 215 households;
- 95% of the land owned by men;
- Exclusively rural nature;
- Livelihood – land & agriculture;
- 70% of women are in agriculture;
- 50% of men are in agriculture;
- Lack of permanent & regular sources of income;
- Seasonal employment;
- Grid electrification in every village;
- Use of woodfuel as a cooking energy;
- Inequalities in accessing safe drinking water;
- Sanitary facilities; and
- 51% of Households got grid electricity for lighting, 49% use kerosene.

<table>
<thead>
<tr>
<th>Energy type</th>
<th>Cooking</th>
<th>Lighting</th>
<th>Production</th>
<th>Transportation/travel</th>
<th>Responsibility Women</th>
<th>Responsibility Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woodfuel</td>
<td>100</td>
<td>00</td>
<td>--</td>
<td>--</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>Bio-gas</td>
<td>15</td>
<td>00</td>
<td>--</td>
<td>--</td>
<td>16</td>
<td>84</td>
</tr>
<tr>
<td>Kerosene</td>
<td>00</td>
<td>37</td>
<td>--</td>
<td>--</td>
<td>88</td>
<td>12</td>
</tr>
<tr>
<td>Electricity</td>
<td>03</td>
<td>60</td>
<td>01(welding)</td>
<td>--</td>
<td>36</td>
<td>64</td>
</tr>
<tr>
<td>Solar</td>
<td>00</td>
<td>02</td>
<td>--</td>
<td>--</td>
<td>00</td>
<td>100</td>
</tr>
<tr>
<td>Diesel</td>
<td>--</td>
<td>01</td>
<td>--</td>
<td>--</td>
<td>00</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Human energy allocated in cooking</th>
<th>% households</th>
<th>Woodfuel/biomass collection and supply</th>
<th>% of household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wife alone</td>
<td>76</td>
<td>=</td>
<td>74</td>
</tr>
<tr>
<td>Wife with some help from husband</td>
<td>14</td>
<td>=</td>
<td>08</td>
</tr>
<tr>
<td>Wife with some help from daughter</td>
<td>08</td>
<td>=</td>
<td>11</td>
</tr>
<tr>
<td>Wife with all others in family</td>
<td>02</td>
<td>=</td>
<td>00</td>
</tr>
<tr>
<td>Hired labour</td>
<td></td>
<td>Hired labour</td>
<td>07</td>
</tr>
</tbody>
</table>
### Nature of involvement by gender

<table>
<thead>
<tr>
<th>Involvement in the project</th>
<th>No of household involved</th>
<th>% men</th>
<th>% women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project designing phase</td>
<td>00</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Providing base-line information</td>
<td>168</td>
<td>82</td>
<td>18</td>
</tr>
<tr>
<td>Attending to awareness raising made by CTC</td>
<td>108</td>
<td>82</td>
<td>18</td>
</tr>
<tr>
<td>Reacting negatively to dendro-plant establishment</td>
<td>122</td>
<td>54</td>
<td>46</td>
</tr>
<tr>
<td>Workers in the plant</td>
<td>06</td>
<td>100</td>
<td>00</td>
</tr>
<tr>
<td>Organizing supply</td>
<td>12</td>
<td>100</td>
<td>00</td>
</tr>
<tr>
<td>Organizing production</td>
<td>40</td>
<td>94</td>
<td>06</td>
</tr>
<tr>
<td>Processing (producing 3-4 inch chips for the boiler)</td>
<td>24</td>
<td>100</td>
<td>00</td>
</tr>
<tr>
<td><strong>Receiving project stimulations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairy</td>
<td>04</td>
<td>family</td>
<td></td>
</tr>
<tr>
<td>Compost pits (to use <em>Gliricidia</em> foliage)</td>
<td>12</td>
<td>93</td>
<td>07</td>
</tr>
<tr>
<td>Farm intensification subsidy – (pepper vine for <em>Gliricidia</em>)</td>
<td>12</td>
<td>92</td>
<td>08</td>
</tr>
<tr>
<td>Soil conservation measures/erosion reduction (<em>Gliricidia</em> raws grown along contours)</td>
<td>18</td>
<td>100</td>
<td>00</td>
</tr>
<tr>
<td>Enhancing vegetal cover by growing <em>Gliricidia</em> at 1 meter intervals in farms, homegardens</td>
<td>12</td>
<td>100</td>
<td>00</td>
</tr>
</tbody>
</table>

**Figure 3. Changes in men’s and women’s responsibilities**

<table>
<thead>
<tr>
<th>Pre/Project Situation %</th>
<th>Project Situation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedges, Fences in farmland</td>
<td>Planting + Nurturing</td>
</tr>
<tr>
<td>For household use</td>
<td>Subsidy Links</td>
</tr>
<tr>
<td>Household use</td>
<td>Coppicing</td>
</tr>
<tr>
<td>Trimming, debarking</td>
<td>Processing</td>
</tr>
<tr>
<td>Free day to day supply</td>
<td>Selling</td>
</tr>
<tr>
<td>NA</td>
<td>Supplying</td>
</tr>
<tr>
<td>Men</td>
<td>Agent</td>
</tr>
<tr>
<td>Women</td>
<td>Supply to plant-site</td>
</tr>
</tbody>
</table>
Prior to Dendro-energy project;                 With Dendro-energy project

Woodfuel Flows From Supply Systems
### Reasons for lack of women’s involvement in Dendro-energy development

<table>
<thead>
<tr>
<th>Reason</th>
<th>No. reported as a problem</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land scarcity</td>
<td>162</td>
<td>12</td>
</tr>
<tr>
<td>Lack of organizations for women to link-up</td>
<td>163</td>
<td>11</td>
</tr>
<tr>
<td>Lack of capital to enter supply chain</td>
<td>136</td>
<td>15</td>
</tr>
<tr>
<td>Lack of contacts with private sector/agency</td>
<td>148</td>
<td>13</td>
</tr>
<tr>
<td>Neglect of women’s concerns by men – land owners</td>
<td>192</td>
<td>04</td>
</tr>
<tr>
<td>Preference of having farm space for food production</td>
<td>164</td>
<td>10</td>
</tr>
<tr>
<td>Reluctant to grow woodfuel as a cash crop</td>
<td>190</td>
<td>06</td>
</tr>
<tr>
<td>Poor technological knowledge</td>
<td>120</td>
<td>16</td>
</tr>
<tr>
<td>Lack of common/own land for growing Gliricidia</td>
<td>146</td>
<td>14</td>
</tr>
<tr>
<td>Lack of economic benefits for women</td>
<td>190</td>
<td>06</td>
</tr>
<tr>
<td>Lack of trust on CTC &amp; private company</td>
<td>176</td>
<td>09</td>
</tr>
<tr>
<td>Reluctance to lose food producing space</td>
<td>184</td>
<td>07</td>
</tr>
<tr>
<td>Preference for having farm woodfuel for the Hh. Use</td>
<td>194</td>
<td>03</td>
</tr>
<tr>
<td>Reluctance to divert their sources</td>
<td>190</td>
<td>05</td>
</tr>
<tr>
<td>It does not provide benefits/solution to family &amp; community energy needs</td>
<td>198</td>
<td>01</td>
</tr>
<tr>
<td>Reluctance to lose women’s control over land</td>
<td>158</td>
<td>12</td>
</tr>
<tr>
<td>Project does not offer answers to poverty &amp; reducing poverty</td>
<td>196</td>
<td>02</td>
</tr>
<tr>
<td>It is designed to provide profit for companies and the rich</td>
<td>191</td>
<td>05</td>
</tr>
<tr>
<td>Income and employment opportunities are insignificant</td>
<td>182</td>
<td>08</td>
</tr>
</tbody>
</table>

(Ranking of reasons by number of reporting)

### Ranking of the problems of dendro-energy project

<table>
<thead>
<tr>
<th>Problem</th>
<th>Perceived problems</th>
<th>No concern</th>
<th>Total responded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of women’s control over village woodfuel source</td>
<td>162 (80*)</td>
<td>41</td>
<td>203</td>
</tr>
<tr>
<td>Tendency for them to depend on leftovers</td>
<td>134 (69)</td>
<td>60</td>
<td>194</td>
</tr>
<tr>
<td>Alienation of women’s energy use &amp; needs</td>
<td>176 (83)</td>
<td>36</td>
<td>212</td>
</tr>
<tr>
<td>Loss of control over farm use &amp; woodfuel production</td>
<td>161 (70)</td>
<td>66</td>
<td>227</td>
</tr>
<tr>
<td>Loss of control over decisions</td>
<td>148 (78)</td>
<td>49</td>
<td>190</td>
</tr>
<tr>
<td>Diversion of women’s woodfuel sources for National grid</td>
<td>160 (83)</td>
<td>72</td>
<td>192</td>
</tr>
<tr>
<td>Lack of energy benefits for family</td>
<td>174 (81)</td>
<td>41</td>
<td>215</td>
</tr>
<tr>
<td>Control of woodfuel by private sector</td>
<td>161 (80)</td>
<td>40</td>
<td>201</td>
</tr>
<tr>
<td>Lack of local control over the system</td>
<td>141 (70)</td>
<td>61</td>
<td>202</td>
</tr>
<tr>
<td>Lack of opportunities for women to involve/get benefits</td>
<td>132 (69)</td>
<td>58</td>
<td>190</td>
</tr>
</tbody>
</table>

* (Number in bracket refers to percentage)
Limitations:

- Farmers are not committed to produce for dendro-plant;
- Intermediaries control the supply chain;
- Women are not recognized as farm managers;
- Income is handle by men;
- No employment opportunities are generated to improve income & livelihood; and
- Production/supply is not organized to have a control over the system.

Traditional Biomass Energy System in Hapuwala

Key Features:

- 1980s village electrification for lighting;
- 59% of households use electricity for lighting, others use kerosene;
- Biomass remains sources of cooking energy;
- From 60s to 90s biomass energy for tobacco curing;
- Severe land degradation & adaptation of SALT;
- 316 households in the village;
- 60 households consists of 267 people;
- Agriculture is the primary income for 68%);
- Agriculture is the second resource for 32%;
- Vegetable cultivation is predominant;
- For 76% of women & 62% men main occupation is farming;
- 93% of land owned by men;
### Technology using biomass and the reason for each type

<table>
<thead>
<tr>
<th>Hearth type</th>
<th>Reasons for using/advantages</th>
</tr>
</thead>
</table>
| Semi-circular mud hearths         | - Easy to construct, manage and repair;  
                                    | - Need less woodfuel;  
                                    | - Residues could be burnt;  
                                    | - Less smoke;  
                                    | - Energy is not lost, and released energy is captured for food processing;  
                                    | - Construct double or tribal units on a line in a narrow space;  
                                    | - Enough heat/smoke is released for drying food in smoke trays and for conserving seeds, nuts and food;  
                                    | - Hearth heat remains for keeping water warm for drinking and preparing tea;  
                                    | - Technology and materials are local.                                                                                                                                                                                     |
| Three stone hearths                | - For cooking large pots for social occasions and farm workers;  
                                    | - For processing food;  
                                    | - Par-boiling rice;  
                                    | - For using unsplit segment of logs, roots and thorny wood;  
                                    | - Easy to construct fixing 3 stones/bricks and use it as needed;  
                                    | - Ability to move and fix outside the kitchen.                                                                                                                                                                          |
| Improved stoves                    | - For cooking small family pots;  
                                    | - Less woodfuel is required;  
                                    | - Less smoke.                                                                                                                                                                                                              |

---

### Gender specific roles for sustaining the system

<table>
<thead>
<tr>
<th>Role</th>
<th>Task</th>
<th>Activity by gender</th>
</tr>
</thead>
</table>
| Management of supply system               | - Maintaining trees in homegardens & farms;  
                                    | - Up-keeping fences & hedges;  
                                    | - Conserving state property (forest & reservations).  
                                    | - Enrichment planting;  
                                    | - Nurturing;  
                                    | - Collective engagement in gathering woodfuel from state property;  
                                    | - Manage coppice growth from tree stumps.  
                                    | - Enrichment planting;  
                                    | - Coppicing & branch pruning.  
                                    | Men                                                                 | Women                                                                 |
| Activate woodfuel supply mechanism        | - Gathering & portaging wood from outside sources.  
                                    | - Collection of agro-residues;  
                                    | - Collection of woody biomass;  
                                    | - Trimming;  
                                    | - Carrying for domestic use;  
                                    | - Processing;  
                                    | - Maintaining stocks.  
                                    | - Harvesting (occasional);  
                                    | - Cross-cutting;  
                                    | - Transportation in trucks (rare & limited to special occasions).  
                                    |                                                                 |                                                                 |
| Woodfuel consumption for generating energy | - Efficient combustion of wood & agro-residues.  
                                    | - Maintaining kitchen hearths;  
                                    | - Cooking food on woodfuel for the family, farm workers and social occasions;  
                                    | - Processing food;  
                                    | - Cleaning hearths;  
                                    | - Attending to ash & soot.  
                                    | - Assisting women occasionally in cooking.  
                                    |                                                                 |                                                                 |
Aspects Used in Valuing Biomass Supply Sources

- Access;
- Rights to use sources;
- Nature/type of biomass needed & amount available;
- Time & energy required;
- Nature of work involved; and
- Ability to handle.

Relative importance of biomass supply sources for women in Hapuwala
The resource transect of the supply sources

<table>
<thead>
<tr>
<th>Sources</th>
<th>Homesteads</th>
<th>Fences &amp; Hedges</th>
<th>Farmland</th>
<th>Forest &gt; Shrubs</th>
<th>Riparian Systems</th>
<th>Public Places</th>
<th>Reservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Biomass</td>
<td>Thinning - woody segments</td>
<td>Pruning &amp; coppicing woody segments</td>
<td>Agro-residues Branch pruning of trees</td>
<td>Woody biomass Sticks &amp; dead wood</td>
<td>Bamboo Palm leaves Stalks</td>
<td>Branch wood</td>
<td>Wood residues</td>
</tr>
<tr>
<td>Issues</td>
<td>Inadequate supply Irregular supply Limited harvest Lack of control</td>
<td>Limited availability Limited options Lack of control</td>
<td>Seasonal supply Lack of control Limited harvest</td>
<td>Distance Harvesting risks Lack of authority Restricted use</td>
<td>Distance Harvesing risks Lack of authority Restricted use</td>
<td>Limited &amp; irregularity Lack of authority Restricted use</td>
<td>Distance Lack of authority Restricted use</td>
</tr>
</tbody>
</table>
Community-based Off-grid Dendro-energy Development in Wadagahakiwla

**Key Features:**
- Project implemented in year 2004;
- Wadagahakiwla has no electricity;
- Primary livelihood is agriculture;
- Total population in 98 household is 472 (51.1% women & 48.9% men);
- 62% got permanent houses;
- 82% got more than 2 acres per family;
- 1980s commercial agriculture has expanded;
- 1980s land regularization;
- Present rubber, homegarden, paddy and chena;
- *Wadagahakiwla Dendro Power Electricity Consumer Society has been formed to manage the project.*

### Energy use in the village by % of households

<table>
<thead>
<tr>
<th>Energy type</th>
<th>Items</th>
<th>Service</th>
<th>% of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene</td>
<td>Lamps</td>
<td>Lighting</td>
<td>96</td>
</tr>
<tr>
<td>Solar panels</td>
<td>Lamps</td>
<td>Lighting</td>
<td>04</td>
</tr>
<tr>
<td>Diesel</td>
<td>Motorcycle</td>
<td>Traveling</td>
<td>03</td>
</tr>
<tr>
<td>Battery</td>
<td>Radio</td>
<td>Leisure/information</td>
<td>88</td>
</tr>
<tr>
<td>Battery</td>
<td>TV</td>
<td>Leisure/information</td>
<td>76</td>
</tr>
<tr>
<td>Biomass</td>
<td>Heaths</td>
<td>Cooking</td>
<td>100</td>
</tr>
<tr>
<td>Charcoal</td>
<td>Iron</td>
<td>Ironing</td>
<td>64</td>
</tr>
</tbody>
</table>
Project Implementation

- Partnership between the society & Energy Forum;
- Membership is equally opened;
- Fee is Rs. 500/=, 250 as entry fee & 250 membership fee;
- Households are committed to contributed family labour on self-help basis;
- 250 kg of Nanchi (*Gliricidia*) provided by each households to start the project;
- Daily consumption is 40-60kg of feedstock;
- 60kg per month provided by a family;
- Price of *Gliricidia* is Rs. 200 per cubic metres.
- 19 member committee in-charge of 5-6 households;

Project Impact

- Social capital & community level focal point;
- Partnership between NGOs & dendro consumer society;
- Awareness & management skills;
- Equal opportunities for village households to get electricity through society;
- Local control over supply chain;
- Economic benefits for suppliers;
- Local capacity for management; and
- Cash crop integrated woodfuel planting.
Growing Our Own Energy

Chipping Wood Bio Mass
### Gender specific impacts/implications of the project perceived by men and women

<table>
<thead>
<tr>
<th>Aspect/category</th>
<th>Nature of benefit</th>
<th>% responded &amp; endorsed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy services</strong></td>
<td></td>
<td>Men</td>
</tr>
<tr>
<td><strong>Lighting – from 5-7 in the evening</strong></td>
<td>Increased efficiency in attending to domestic chores</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Reduced risks of using kerosene lamps</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Enhanced mobility inside the house</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Psychological relaxation</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Stimulating children for education</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Reading/learning opportunities</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Social interactions/work</td>
<td>86</td>
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<td>Attending to production work (mat weaving etc.)</td>
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<td>Reduce pressure on domestic chores</td>
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<tr>
<td><strong>Accessing Media</strong></td>
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<tr>
<td>Receiving information/news</td>
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<tr>
<td>Leisure</td>
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<td><strong>Household electrical appliances</strong></td>
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<tr>
<td>Ironing</td>
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<tr>
<td>Boiling water</td>
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<tr>
<td><strong>Cooking</strong></td>
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<td>Increased pressure on women’s resources</td>
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<td>Provisions for using electricity in cooking</td>
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<td>Enhanced efficiency</td>
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Contd/.....
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<tr>
<th>Social</th>
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<tr>
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<td>Community level organization for common goals</td>
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<td>Equal opportunities for men &amp; women</td>
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<td>Building reciprocity</td>
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<td>Building managerial skills</td>
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<td>Equal opportunities for the villagers for improving quality of life</td>
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<td>Leadership opportunities (offices)</td>
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<td>Membership in energy focused organization</td>
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<td>Organizing production as suppliers</td>
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<td>Organizing transportation</td>
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<td>Empowerment</td>
<td>Cash returns for family</td>
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<td>Equal opportunities for the households</td>
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<td>Democratize decision on leadership/decision</td>
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<td>Recognizing community decisions</td>
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<td>Building competence</td>
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<td>Economic benefits</td>
<td>Getting value for farm/household produced (Nanchi)</td>
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<td>Getting employment opportunities</td>
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<td>Potential for starting village/home-based industries</td>
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<td>Farm intensification by growing more Nanchi</td>
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<td>Farm intensification by adding pepper vine</td>
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<td>Eliminating expenses on Kerosene</td>
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<td>Getting income from Nanchi to cover energy cost</td>
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<td>More values for earning income</td>
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Contd/…

| Environmental | Maintaining smell free intra-household conditions | 100 |
|              | Avoiding kerosene smoke in household environment | 100 |
|              | Enhanced perennial vegetal cover                 | 63 |
|              | Potentials to enrich soil                         | 90 |
|              | Potentials to conserve water & reduce water scarcity | 72 |
|              | Reducing soil erosion                             | 96 |
POLICY RECOMMENDATIONS

- Community partnership;
- Internalization;
- Gender sensitive policy;
- Gender integrated initiatives;
- Building social capital at community level;
- Gender integrated planning;
- Mobilization;
- Local organizations;
- Attention for cooking energy;
- Gender disaggregated information;
- Renewable energy policy;
- Economic advancement;
- Clean energy technology for domestic cooking;
- Energy enterprise and services;
- Integrated energy technology;
- Training; and
- Evaluation.

Let's Grow Our Own Energy

Re-Greening Sri Lanka
Thank you