


Renewable Energy Benefits: Decentralised Solutions in the Agri-food Chain

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IRENA's work on the topic



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International Renewable Energy Agency

**RENEWABLE ENERGY BENEFITS
DECENTRALISED SOLUTIONS
IN THE AGRI-FOOD CHAIN**



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Renewable Energy Jobs & Access

Renewable Energy Jobs:
STATUS, PROSPECTS & POLICIES
BIOFUELS AND GRID-CONNECTED
ELECTRICITY GENERATION

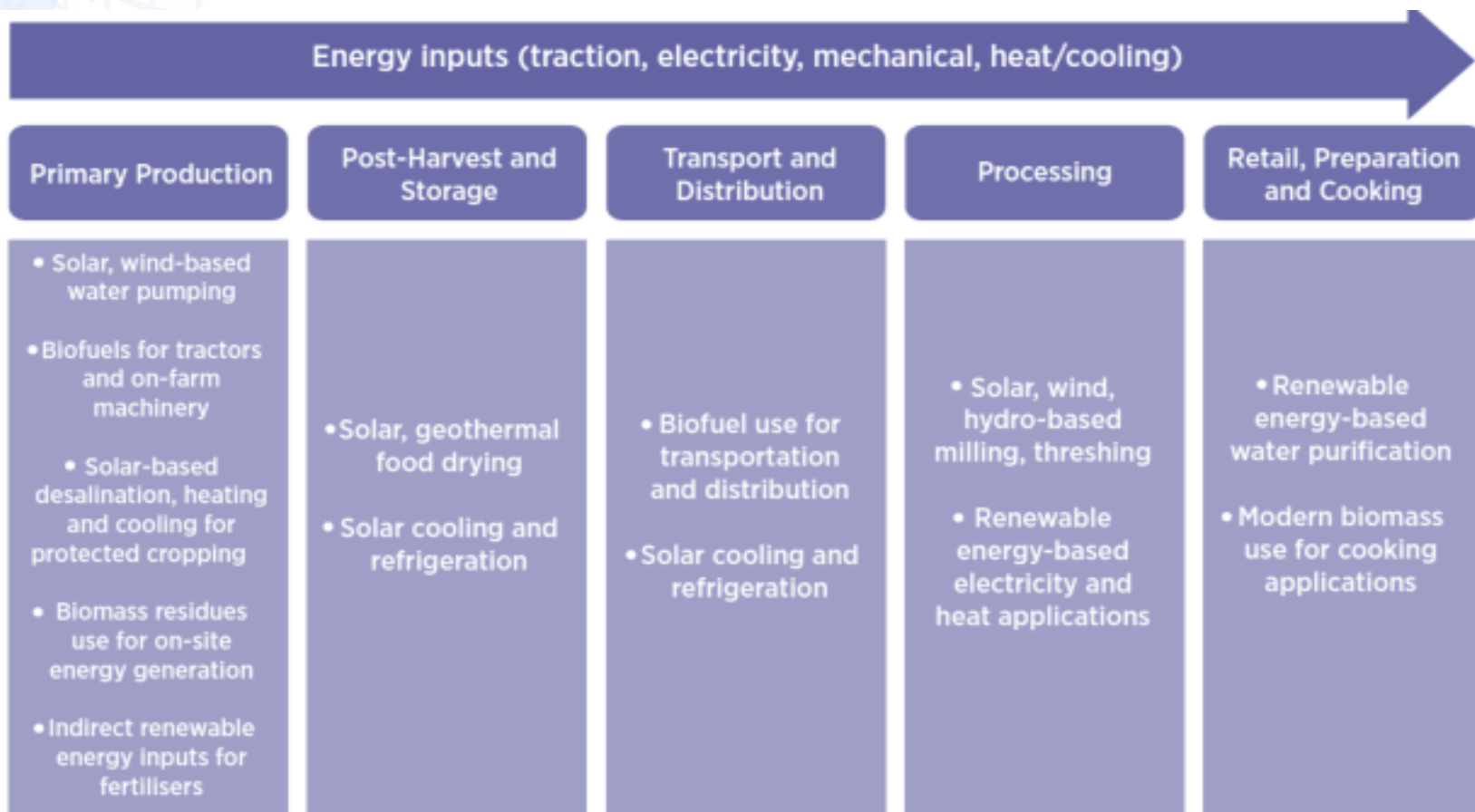
IRENA POLICY BRIEF
Solar pumping for irrigation:
Improving livelihoods and sustainability

RENEWABLE ENERGY IN THE WATER, ENERGY & FOOD NEXUS

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International Off-Grid Renewable Energy Conference & Exhibition

RENEWABLE ENERGY JOBS CONFERENCE
Exploring tomorrow's jobs today
21 January - Abu Dhabi, UAE

Energy along the agri-food chain



Source: Based on FAO, 2011b; Practical Action, 2012

Socio-economic benefits in the agri-food chain

Socio-economic impacts

Economic benefits

Health benefits

Environmental benefits

Well-being benefits



Water pumping for irrigation



Drying produce



Refrigeration



Agro-processing



Cooking and water heating

Economic benefits

Economic benefits

Health benefits

Socio-economic impacts

Environmental benefits

Wellbeing benefits



Savings on energy spending

- In India, 4,000 solar pumps saved around USD 360,000/yr on diesel subsidies
- Tea curing in Sri Lanka saves 1.38 kg of fuel per 1 kg of tea
- Almost USD 4,000 savings on community in Nepal from IWM/E



Job creation

- 7,572 people employed in operating 8,493 IWMs in Nepal
- Biogas programme in Nepal employs total 1,083 FTEs on an annual basis
- 76,000 jobs in the Global Alliance for Clean Cookstoves worldwide



Income generation

- In Zimbabwe solar pumps increased household incomes by 286% for the very poor, 173% for the poor and 47% for middle-income groups
- A solar dryer in Malawi can dry 90 kg of maize grain per batch and has a payback period of less than one year if surplus grain is dried and sold in the market

Health benefits

Economic benefits

Health benefits

Socio-economic impacts

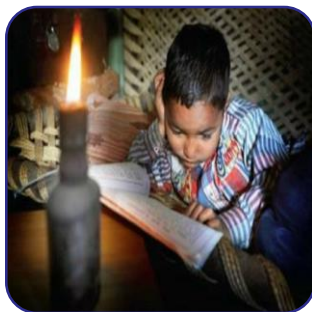
Environmental benefits

Wellbeing benefits



Prevention of malnutrition and food contamination

- Polluted water consumption causes 4% of all deaths in rural areas
- Food losses as high as 40-50% for root crops, fruits and vegetables, 30% for cereals and fish, and 20% for oilseeds



Prevention of diseases related to indoor air pollution

- Almost 4.3 million people die every year from exposure to household air pollution
- Potential to reduce respiratory infection by 25% among children

Environmental benefits

Economic benefits

Health benefits

Socio-economic impacts

Environmental benefits

Wellbeing benefits



Reduced deforestation and emissions

- The introduction of biogas digesters in rural Nepal enabled the saving of almost 250 kg of wood per month per household
- Globally, 5 million solar pumps can save 10 billion litres of diesel, and nearly 26 million tonnes of CO₂ (equivalent to annual emission from 5.5 million vehicles)
- In Sri Lanka, biomass digesters replacing diesel for tea drying in nine tea factories saved the burning of 1.2 million litres of diesel and almost 3 000 tonnes of CO₂ annually



Waste management

- Runs on animal manure and agriculture waste
- 9 biogas digesters in Vietnam can treat 8,500 tons of manure and avoid the emission of 2,200 tons of CO₂ equivalent per year

Well-being benefits

Economic benefits

Health benefits

Socio-economic impacts

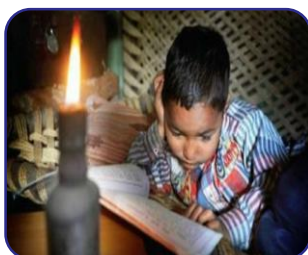
Environmental benefits

Wellbeing benefits



Gender empowerment

- Solar Sister: over 2,198 women entrepreneurs
- Global Alliance for Clean Cookstoves: 76,000 women
- Grameen Shakti: almost 23,000 women technicians
- ENERGIA: strengthened 3,000 women in Africa and Asia



Improved education

- 614 thousand solar lights in Africa is estimated to have enabled 765 million extra study hours for children in 2014
- 28% of solar light users use the annual savings on kerosene, reported to be close to USD 70 per year, on school materials and tuition fees



Improved quality of life

- Entertainment, comfort, etc.
- 40% of men spend extra time on leisure
- 19% of women spend time on leisure (35% on farm-related activities, 3% other income generating activities outside farm, 26% domestic responsibilities 16% on taking care of the children)

Key messages

- Effective policies and regulations are needed to create an enabling environment for renewables deployment
- Policies should support capacity building and training to meet skills demand and to reduce dependence on foreign know-how
- Government intervention is needed to facilitate market access for products and to enable income generation
- Business models need to be tailored to specific conditions to ensure the successful and sustainable delivery of projects
- The nexus between food, energy and water must be considered at all times
- Sound data collection and awareness-raising are needed to mainstream the socio-economic benefits of decentralized renewables solutions



Source: SELF/Robert Freling



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Thank you!