Integrating Climate Change Concerns into Sustainable Development Strategies

Case studies exploring the linkages between integrated policy options

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Bagasse based power generation

UNEP Risøe Centre – Energy Climate and Sustainable Development

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- International research team of 24 economists and scientists.
- Established in 1990
- Partnership between UNEP, Danida and Risø National Laboratory
- Supporting the implementation of UNEP's energy programme
- Worked with 42 countries last year

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Development Issues are Closely Linked to Climate Change

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- Common driving factors, such as, Economic growth, investments, technological change.
- Vulnerability reduction and welfare enhancement (including basic human needs, equity and justice) are important for both
- Natural resources and environmental impacts.
- Alternative development pathways could influence GHG emissions considerably
- Integrated view on development goals (millennium and national) and climate change
- Institutional issues

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Potential SD Impacts of CC Activities and how these may be Assessed

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Economic dimension	- generate employment - reduce economic burden of energy imports - provide financial returns to local entities - positive impact on Balance of Payment (BoP) - technological change - be cost-effective
Social dimension	- increase equity - increase energy access - address gender issues - promote education and training - improve health - alleviate poverty - strengthen legal framework - improve governance - increase information sharing
Environmental dimension	- achieve GHG emission reductions - provide local environmental benefits, e.g. related to: air pollution, water, soil, waste - reduce use of exhaustible resources - increase use of renewable resources - conserve biodiversity

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Development and Climate Project

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- International programme with partners from Bangladesh, Brazil, China, India, South Africa, Senegal, Denmark, Canada, France, Germany, Netherlands and the United States
- Organisations associated with the project include UNEP, IEA, OECD, UN Foundation, WB, UNDP, FCCC Secretariat and governments
- Two phases

- Explore national development strategies and policies that both meet development priorities and address climate change
- Energy and food/water access.
- Identify policy options and projects that assist in the transition to long term sustainable development including climate change
- Extract lessons towards global cooperation.

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IIMA
India

ERC
South Africa

ENDA-TM
Senegal

BCAS
Bangladesh

KEI
S. Korea

ERI
China

COPPE
Brazil

Stanford Univ.
USA

IISD
Canada

UNEP Risø Centre
Denmark

MNP/RIVM and PRI, The Netherlands
IIED, UK
PIK, Germany
CIRED, France

Sustainable Development Indicators

- **Economic indicators**
  - National macro indicators
  - Energy use indicators
  - Energy access indicators
  - Energy investment indicators
- **Environmental indicators (**GHG and local pollutant emissions**)**
- **Social indicators**
  - Energy affordability indicators
  - Employment indicators
- **Mitigation cost curves for energy sector**
- **Adaptation indicators**

National Case Examples – Brazil

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Case example	Development impacts	Climate change mitigation/adaptation
Ethanol programme	Employment, foreign exchange savings, local air pollution	9.45 mtC saved per year (17% of energy sector emissions in 1994)
Zero tillage to ensure higher content of organic matters in soil	Increased use of herbicides, energy cost savings	60-80 mtCO2 not released in 1999, 70% reduction in diesel consumption

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National Case Examples – South Africa

Case example	Development impacts	Climate change mitigation/adaptation
Clean energy generation mix: Gas, hydro, renewables, nuclear	Energy security benefits, local environmental improvements	Annual CO2 savings in 2025: 70 mtCO2
Industrial energy efficiency in 3 major companies	Energy cost savings, local environmental benefits	Annual CO2 savings of around 0.07 mtCO2

National Case Examples - Senegal

Case example	Development impacts	Climate change mitigation/adaptation
Expansion of LPG to substitute fuelwood	Decreased deforestation and negative social impacts from fuelwood consumption. Improved energy access	Savings of 700,000 m^3 wood per year from 1974-2000
Electricity reform including efficiency improvements and supply to rural areas	Reduced electricity supply costs	Reduced GHG emission intensity of power production

VEV, Senegal

Business:
Servicing of wind-powered water pumps in rural Senegal.

AREED Support:
$17,000 loan
Enterprise Dev. Support from ENDA, E+Co

Investment Activity:
- Expanding inventory to shorten service times
- Offering short-term credit to qualified clients

Together, these services should help to ensure that most wind pumps in Senegal become - and remain - operational.

National Case Examples - Bangladesh

Case example	Development impacts	Climate change mitigation/adaptation
Decentralized small NG power, biomass, solar home systems and other renewables, DSM	Supply electricity at 120 kWh/capita per year	Decreased GHG emission intensity of energy supply
Natural gas, oil and gas exploitation, biomass supply, switching from petroleum to NG, energy efficiency in industry.	Supply primary fuel at 4 million BTU/capita/year	Offset threats from climate change in terms of droughts, flooding, salinity, decreased crops, and erosion.

National Case Examples – China and India

Case example	Development impacts	Climate change mitigation/adaptation
China: Energy efficiency in industry and power production	Local air pollution control, Energy cost savings in efficiency cases	Total SD scenario offers CO2 reductions of 1.5 bill.t.C in 2030
India: South Asia energy-electricity market integration	Energy supply savings, cost savings, CO2 and SO2 emission reductions	1.4 billion tC and 50 million ton SO2 saved over 30 years, Flood control, Reduced energy/electricity costs

Linking MDG, Energy and CC

MDGs	Energy Sectoral Themes	Examples of SD Indicators
1. To halve between 1990 and 2015, the proportion of people whose income is below 1$ a day	- Energy for increased production and consumption - Energy for local enterprises - Lighting to facilitate income generation - Energy for machinery - Employment related to energy provision	- Quantity of energy supplied to enterprises, lighting, machinery etc. - Energy costs and the share of this in household income, production costs etc. - No of people employed

Global Network on Energy for Sustainable Development (GNESD)

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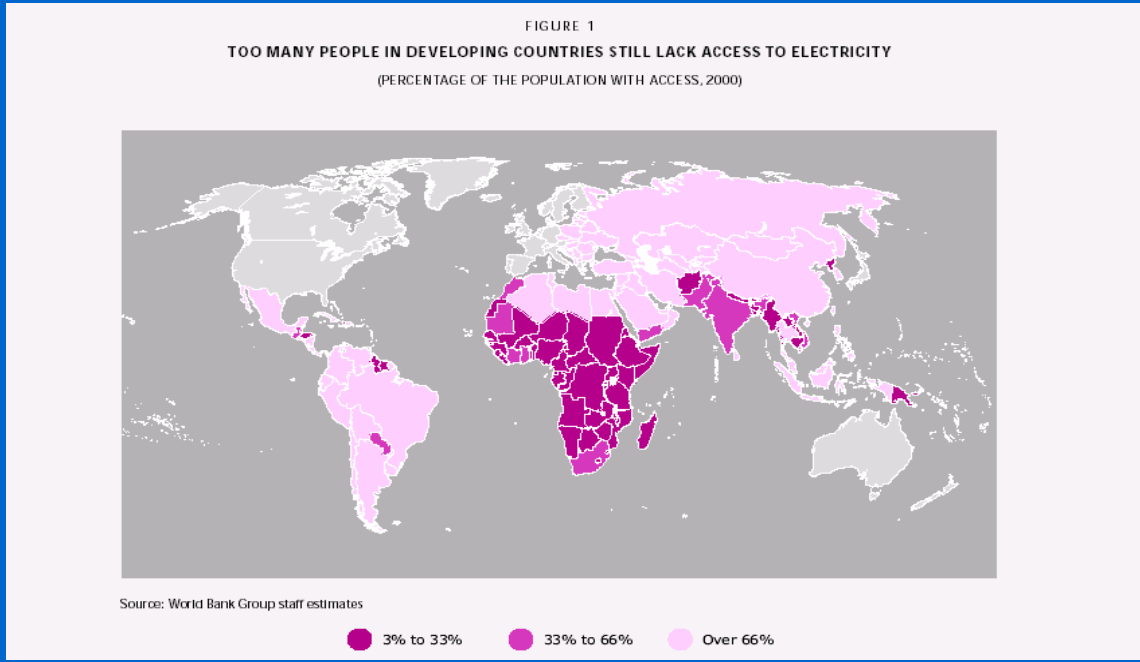
- Energy plays a critical role in development of communities and countries
- Current electricity access levels
- Rural and urban electricity poverty issues
- Political commitment is a key factor



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African Rural Energy Enterprise Development (AREED)

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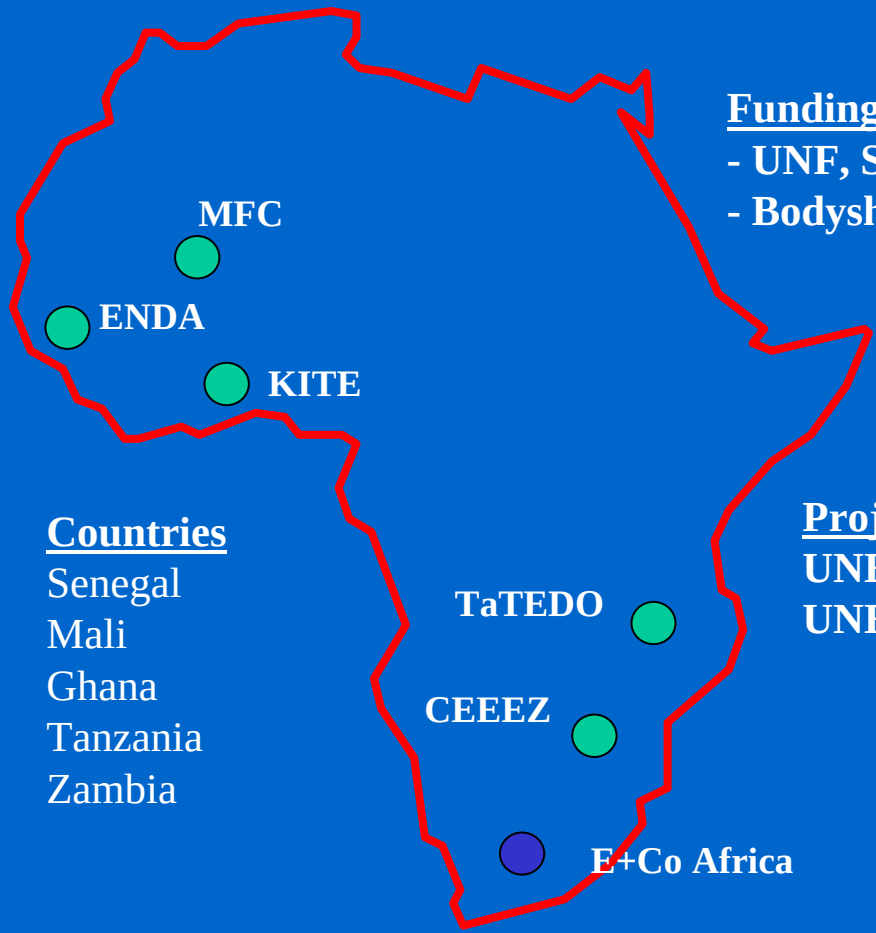
Demonstrating that needed energy services can be delivered on a sustainable basis by small/mid sized local enterprise.

www.areed.org



Countries
Senegal
Mali
Ghana
Tanzania
Zambia

Funding agencies/Investors
- UNF, SIDA, BMZ, Dutch
- Bodyshop, Domini, DBSA

Project coordinators
UNEP Paris
UNEP Risoe

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Anasset, Ghana

Business: LPG distribution

AREED Support: $ 38,000 loan, Enterprise Dev. Support from KITE, E+Co

Investment Activity:

- Purchase plant & equipment
- Increase sales

Status:

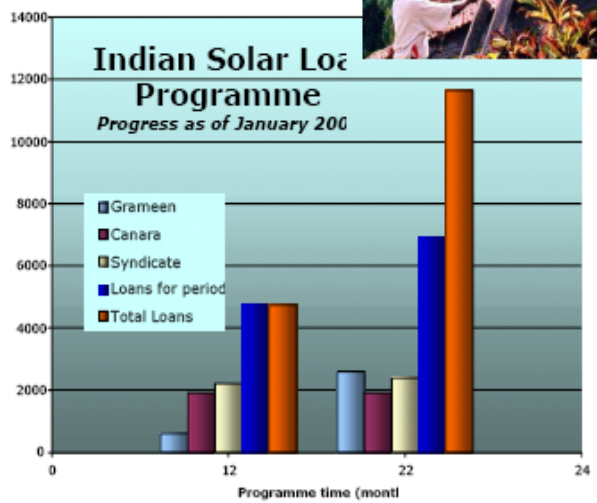
- 1,700 metric tonnes/year, 11,000 households
- 15 Staff, 2 LPG Stations
- $27,000 following on financing from local bank

Infrastructure upgrading increases the delivery and service levels and makes the product more accessible to the community, decreasing dependence on traditional fuels

The Indian Solar Loan Programme

A credit facility in Southern India (Karnataka and Kerala States) to help rural households finance the purchase of Solar Home Systems

- UNEP provides:
  - Interest rate subsidies for borrowers
  - Assistance with technical issues and Vendor Qualification
- Supported by United Nations Foundation and Shell Foundation
- Implemented with two of India's largest banks: Canara Bank & Syndicate Bank - more than 2,000 branch offices, plus their associated *Grameen* banks
- 15,000 SHS loans financed as of May 2005. Only 1,400 financed prior to programme which is on track to finance 20,000 + systems



Key Lessons Learned

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- Diversity of opportunities, projects and approaches

- Quantifying development and climate change impacts of energy policies enhances policy relevance of the research considerably.
- 'Development' aligns and delivers mitigation and adaptation.
- Regional energy co-operation provides opportunities for linking D&C
- The 'non-climate' route for international climate change policy making is feasible and cost-effective.
- Main challenge is implementation.

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Conclusions

- The project offers an analytical framework for integrated development and climate change strategies.
- National case studies demonstrate that many dedicated development policies and activities make (”unintended”) positive climate contributions
- These examples could be replicable, though keeping specific national circumstances is vital.
- Integration of climate and broader SD concerns early in energy policy process (path change) is cost-effective both from development and climate change perspectives.

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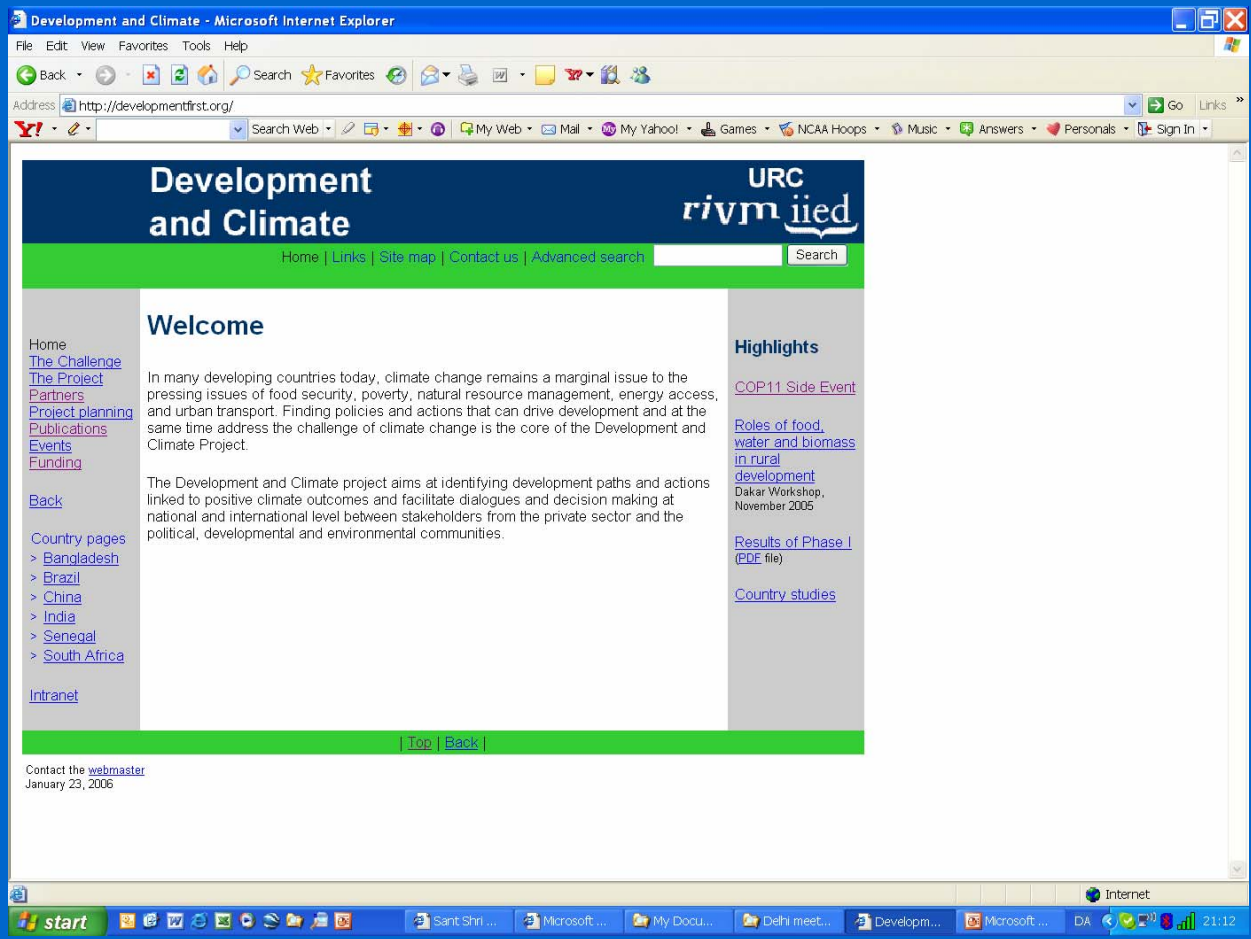

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Time to Choose Path

More information at: *www.developmentfirst.org*