### Expanding Energy Access in Developing Countries

The Role of Mechanical Power

#### Praise for the book...

'It is an excellent report... The case studies have been chosen well to represent the geographic areas as well as range of applications of mechanical energy, and range of models used for implementing the projects. The case studies have also been documented very well. The glossary of mechanical energy devices also appears to be exhaustive and it will be a useful tool for subsequent work in this area.'

Priyadarshini Karve, Appropriate Rural Technology Institute, India

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The United Nations Development Programme (UNDP) is the UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. UNDP is on the ground in 166 countries, working with the countries on their own solutions to global and national development challenges. As they develop local capacity, they draw on the people of UNDP and its wide range of partners.

World leaders have pledged to achieve the Millennium Development Goals, including the overarching goal of cutting poverty in half by 2015. UNDP's network links and coordinates global and national efforts to reach these Goals. Our focus is helping countries build and share solutions to the challenges of: democratic governance, poverty reduction, crisis prevention and recovery, and environment and sustainable development. UNDP helps developing countries attract and use aid effectively. In all our activities, we encourage the protection of human rights, the empowerment of women and capacity development.

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## **Expanding Energy Access in Developing Countries**

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Liz Bates, Steven Hunt, Smail Khennas, Nararya Sastrawinata



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Cover Photos:	Main Image		
	- Men loading goods at upper station of gravity ropeway in the remote Mustang area of Nepal. The scheme, implemented by Practical Action and ICIMOD, has dramatically reduced transport time and drudgery associated with moving food and goods between producers and village markets in the region. (Photo: Upendra Shrestha, Practical Action)		
Cover Photos:	Inserts from top		
	- A farmer irrigating his land with a treadle pump through the ILLISCON project at Joshipur village,		
	Nepal (Photo: Matrika Sharma, Practical Action)		
	- Local technicians maintaining a Kijito Wind Pump in Kenya (Photo: BHEL)		
	- A woman using a Multifunctional Platform in Mali (Photo: UNDP)		

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#### Steven Hunt

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### Foreword

Access to energy services is a fundamental prerequisite for poverty reduction and sustainable human development. Of the over 6.5 billion people in the world today, 2.5 billion depend on traditional biomass for cooking and heating, around 2.6 billion live on less than US\$2 a day, a billion lack clean water and 1.6 billion lack access to electricity. These are some of the stark numbers that define poverty in the world today. Notable in the day-to-day livelihood activities of the poor is the significant role that mechanical power plays in enhancing the productivity of labour in many ways – including in agriculture and food processing, running small enterprises, water-pumping and irrigation – which form the core of poor people's daily activities. In spite of the importance of mechanical power in meeting energy needs, there exists little data on mechanical power in developing countries. There is often also limited technological enhancement applied to what mechanical power equipment is available, and the poor often continue to depend on unimproved versions of mechanical power equipment, inefficiently using human or animal power to meet their most basic energy needs.

This publication documents the contribution of mechanical power to expanding energy access for the poor. It is based on a mapping exercise of international experience and literature, including case studies from various countries in sub-Saharan Africa and South Asia. The mapping exercise is the first phase of a continuing process to study the contribution of mechanical power to expanding energy services for the poor. In the second phase, the study will look more closely at barriers, and strategies to overcome them.

The work is based on the recognition that access to mechanical power contributes to the development of the human, social, financial, natural and physical capitals essential for the poor to increase their resilience to environmental shocks and other pressures on livelihoods. The contribution of this publication is to highlight the importance of mechanical power as a crucial component of the improved energy access that is required to accelerate human development and reduce poverty in developing countries.

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