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**Energy, Poverty and Sustainable Urban Livelihoods**

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## **ABSTRACT**

Urban poverty is an increasing phenomenon. It is characterised by the dominance of the cash economy, increasing reliance on infrastructure and physical assets over the natural environment and increasingly fragmented social relations.

Each of these characteristics of urban poverty is linked (to a greater or lesser extent) to the use of energy and energy services. However, relatively little research has been undertaken into these linkages.

This paper explores the energy/ poverty linkages in poor urban households in Indonesia, Ghana and China using a sustainable livelihoods framework as an analytical tool. It includes illustrative case studies, indicators that reflect the importance of energy within the livelihood priorities of the urban poor and consideration of refinements to the Sustainable Livelihoods (SL) model.

The Sustainable Livelihoods (SL) Approach perceives poverty as a condition of insecurity or vulnerability to shocks and stresses rather than merely a lack of wealth. Broadly, a sustainable livelihood is a way of living that is resilient to shocks and stresses and does not adversely affect the environment for present and future generations.

Using the principles underpinning the SL approach, the study described in this paper was primarily qualitative and participatory, attempting to understanding the relationship between poverty and energy using a research team comprised of both energy and poverty experts.

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## **CONTENTS**

<b>CHAPTER ONE: INTRODUCTION</b>	1
<b>CHAPTER TWO: CONTEXT</b>	2
<b>CHAPTER THREE: FINDINGS</b>	5
<b>CHAPTER FOUR: CONCLUSIONS</b>	17
<b>BIBLIOGRAPHY</b>	
<b>APPENDICES</b>	
A Participating partners	
B Sustainable Livelihoods	
C Energy and Poverty	

## ACRONYMS/ DEFINITIONS

AEAT	AEA Technology plc
CASS	Chinese Academy of Social Sciences
DFID	Department for International Development
DPU	Development Planning Unit, University College London
ETSU	Energy Technology Support Unit, AEAT
FES	Future Energy Solutions, AEAT
FGD	Focus Group Discussions
GDP	Gross Domestic Product
ITB	Institut Teknologi Bandung, Indonesia
KaR	Knowledge and Research (DFID-funded research)
LPG	Liquefied Petroleum Gas
Mikrolet	Seven-passenger public transit taxi
PK	'Peserta Kredit' – Credit Participant
PC	'Peserta Cadangan' – Reserved Participant
PCK	'Pengemudi Cadangan Keliling' – Second Reserved Participant
RW	Neighbourhoods Unit, Indonesia
SL	Sustainable Livelihood
SLF/A	Sustainable Livelihoods Framework/Approach
SUL	Sustainable Urban Livelihoods
UK	United Kingdom

# Energy, Poverty and Sustainable Urban Livelihoods

## CHAPTER ONE: Introduction

Urban poverty is an increasing phenomenon. It is characterised by the dominance of the cash economy, increasing reliance on infrastructure and physical assets over the natural environment and increasingly fragmented social relations. Each of these characteristics of urban poverty is linked (to a greater or lesser extent) to the use of energy and energy services. However, relatively little research has been undertaken into these linkages.

This paper reviews some key findings from a scoping study which used the sustainable livelihoods framework to explore the energy/poverty linkages in poor

urban households in China, Ghana and Indonesia.

Using the principles underpinning the SL approach, this study was primarily qualitative and participatory. It used a research team comprised of both energy and poverty experts.

The findings discussed in the study clearly demonstrate the impact of energy and energy-related policy interventions on the livelihoods of the urban poor. They show that household energy consumption is a significant and indispensable living cost for the urban poor. Energy is essential not only to sustain life, but also to enable households to thrive.

## Chapter Two: Context

### Economic conditions

The study was undertaken in Ghana, Indonesia and China. Both Indonesia and Ghana have experienced economic crises in the late 1990s, but the situation in the two countries has marked differences. The Indonesian economic collapse of 1997 (precipitated by the Asian financial crisis) followed after twenty years of economic growth and improved social welfare. The result was that by early 1997, before the collapse of the Rupia, the number of people living in poverty had more than halved, from 54 million - 40% of the population, to 21 million - 11.4%<sup>1</sup>.

Ghana, in contrast to Indonesia, although it had been the strongest economic player within West Africa, had made far less significant inroads into poverty reduction prior to its economic set back. Furthermore Indonesia is further along the process to recovery than Ghana. By late 1999 the increase in poverty resulting from the economic collapse had already peaked and was beginning to decline, although it was still about 50% higher than pre-crisis levels. In contrast, Ghana's poverty continues to grow, with 40% of the population living below the international poverty line, and 27% in extreme poverty.

China currently has a robust economy<sup>2</sup>. However, within China Guizhou province has a weak economy and is one of China's poorest provinces in terms of GDP per capita – which in 2000 was only 41% of Beijing's; 22% of Shanghai's and 11% of Guangdong's GDP per capital<sup>3</sup>. Guizhou also has extremely high levels of poverty, with almost one-third of its population officially classified as poor. These comprise 13% *absolute poor* (below RNB 800); and 17% *poor* (below RNB 800-1000)<sup>4</sup>. In fact, there are significant indications that poverty in Guizhou is actually deeper than suggested by these published statistics.<sup>5</sup> To date Guizhou has not experienced the economic collapse of either Indonesia or Ghana. However, Guizhou province suffers not only from slow economic growth and widespread poverty, but also from serious ecological and environmental deterioration and social polarisation - the degree of which is even greater than in the coastal provinces of China<sup>6</sup>. In Guizhou, poverty means not only low income, but also includes problems of livelihood sustainability, vulnerable ecology and serious pollution. Table 2.1 summarises the contextual characteristics of the three countries.

### The study communities

This study was undertaken in two poor urban communities in Ghana – *Moshie Zongo* in Kumasi and *Chorkor* in Accra; and in two poor urban communities in Jakarta, Indonesia - *Kelurahan Kramat* and *Kelurahan Gedon*; and the *Ruban area*, in a suburb of *Guiyang City* in *Guizhou province*, China. Table 2.2 summarises the key characteristics of these case-studies.

In China, the case-study is located in a suburb that clearly reflects China's peculiar administrative system regarding the institutional difference between urban and rural areas. It contains urban administrative units – street residence committees and enterprises, as well as the basic rural administrative unit – village committees. Thus the *Ruban area* presents many features unique to poor areas in Chinese society in the current transitional period. Furthermore, it includes the study factory, where the province, with the assistance of DFID, conducted an energy intervention project in 1997. This intervention was aimed at improving the economic efficiency of enterprise, and environmental conditions by reducing factory pollution.

Whilst the study explores the energy-poverty relationship in all three case-studies, the focus of analysis varies somewhat in each place. In Indonesia and Ghana the emphasis is on understanding the macro-micro relationship. With Guizhou there was the opportunity to explore both macro-meso (government policy/meso level – industrial enterprise) relationships and meso-micro relationships (provincial level-micro) relationships.



**Table 2.1: Macro context of three case-study countries**

	<b>Ghana</b>	<b>Guizhou province – China</b>	<b>Indonesia</b>
<b>Economic</b>	<ul style="list-style-type: none"> <li>❑ 1999 terms of trade shock – lowered prices for cocoa and gold (two main sources of revenue for Ghana)</li> <li>❑ Devaluation (currency value halved in 2000) causing the cost of oil imports to increase</li> <li>❑ ‘Highly Indebted Poor Country’ (HIPC) – total debt of over \$6 billion (85% of GDP)</li> <li>❑ Domestic economy – mostly subsistence agriculture</li> <li>❑ Increased reliance on imported energy as levels of Lake Volta fall</li> </ul>	<ul style="list-style-type: none"> <li>❑ China as a whole in a transitional period</li> <li>❑ Guizhou has a ‘sluggish’ economy</li> <li>❑ One of poorest provinces in China – one of lowest GDPs</li> <li>❑ 30% statistically poor</li> <li>❑ Economic reform and restructuring resulted in economic deterioration - collapse of enterprises, unemployt.</li> <li>❑ Limited resources other than major coal deposits – coal of inferior quality....high sulphur content</li> </ul>	<ul style="list-style-type: none"> <li>❑ mid-1997 severe economic crisis –fall in value of currency</li> <li>❑ 16% food price inflation February 96- February 99</li> <li>❑ 80% non-food price inflation February 96- February 99</li> <li>❑ Reduction in subsidies post 1997</li> </ul>
<b>Physical</b>	<ul style="list-style-type: none"> <li>❑ Terrain is mostly low plains with a dissected plateau in the south-central area</li> <li>❑ Weak physical infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>❑ Guiyang capital city and most developed part of province – modern buildings and infrastructure</li> <li>❑ Rural backwardness</li> <li>❑ Significant difference between urban and rural areas</li> </ul>	<ul style="list-style-type: none"> <li>❑ In urban areas highly developed physical assets ( e.g. skyscrapers, shopping malls, hotels)</li> <li>❑ Construction booming</li> <li>❑ City boundaries continually extended</li> <li>❑ Strong (but diminishing) oil production – only OPEC member in ASEAN</li> </ul>

**Table 2.1: Macro context of three case-study countries (continued)**

	<b>Ghana</b>	<b>Guizhou province – China</b>	<b>Indonesia</b>
<b>Socio-economic and Social</b>	<ul style="list-style-type: none"> <li>❑ Ghana 18.9 million population</li> <li>❑ Urban population is rapidly expanding (37.9% of population)</li> <li>❑ Most Ghanaians are black African (99.8%) – with four main tribes.</li> <li>▣ 38.8% live below international poverty line (US \$1 per day)</li> <li>▣ 27% live in <i>extreme</i> poverty (unable to meet food requirements even if devoted whole budget to food)</li> <li>▣ Urban poverty is increasing – characterised by low income and residence in high-density areas with overcrowding and weak infrastructure.</li> <li>▣ Urban poor suffer from high cash costs of urban survival - spend approx 60% of income on food</li> </ul>	<ul style="list-style-type: none"> <li>❑ Guizhou province 3.73 million population</li> <li>❑ New urban poor resulting from economic decline</li> <li>❑ 30% officially defined as poor but this is understatement</li> <li>❑ Unskilled migrants to city – the urban ‘gleaners’ - rubbish collectors, builders and vegetable pedlars -are excluded from statistics</li> <li>❑ Low livelihood security</li> <li>❑ Social (rich/poor) polarisation</li> <li>❑ One third of population from national minorities</li> </ul>	<ul style="list-style-type: none"> <li>❑ Indonesia 210 million population, Jakarta 9 million population</li> <li>❑ Approx half population is Javanese, other half are a mix of ethnicities</li> <li>❑ 87% Muslim</li> <li>❑ Undergoing rapid urbanisation</li> <li>❑ 76-97 improved social and economic welfare</li> <li>❑ 97 – 11.34% (21.5 millions) of population poor compared with 76 - 40% (54.2 millions)</li> <li>❑ Severe growth in poverty and social problems (unemployment, increased domestic violence, increased school dropouts, increased crime) due to economic crisis. Between 97 and December 1998 increase of additional 27 million poor.</li> <li>❑ Situation more severe in urban than rural areas</li> <li>❑ Decline in scale of poverty started in August 1999 but poverty rate still about 50% higher than pre-crisis level.</li> </ul>

**Table2.1: Macro context of three case-study countries (continued)**

	<b>Ghana</b>	<b>Guizhou province – China</b>	<b>Indonesia</b>
<b>Environment</b>	<ul style="list-style-type: none"> <li>❑ Polluted water supplies</li> <li>❑ Deforestation</li> <li>❑ Desertification</li> <li>❑ Depletion of water levels in Lake Volta</li> </ul>	<ul style="list-style-type: none"> <li>❑ High growth achieved at high input, high energy consumption and high pollution - <b>deteriorating environment</b></li> <li>❑ High levels of pollution results from use of inferior coal</li> <li>❑ Vulnerable environment, polluted water, soil and air, vulnerable ecology</li> </ul>	<ul style="list-style-type: none"> <li>❑ As part of the climate change action plan, the 1990 Presidential decree on conservation of energy was issued.</li> <li>❑ Since then, there have been improvements in energy production and transmission in the electricity sector, and a reduction in distribution losses</li> </ul>
<b>Political</b>	<ul style="list-style-type: none"> <li>❑ Very political unstable in post-colonial era (1957 onwards) – e.g. coups, military govt, authoritarian ruling</li> <li>❑ 1992 democratic constitution established – e.g. multiparty politics, regular &amp; universal elections</li> <li>❑ New government (New Patriotic Party) since December 2000 – but only hold half of parliamentary seats</li> <li>❑ 10 administrative regions – receive finance from central govt in a moves to increase decentralisation</li> </ul>	<ul style="list-style-type: none"> <li>❑ Current constitution 1982 – ‘socialist state belonging to the people’</li> <li>❑ Post-1978 reforms including market liberalisation have de facto increased the autonomy of local governments.</li> <li>❑ In recent years increased tensions between central and local governments</li> </ul>	<ul style="list-style-type: none"> <li>❑ Unstable political situation late 90s and 00s – June 1999 election brought end of Soeharto’s authoritarian leadership; Wahid elected – downfall due to corruption scandal – replaced by President Megawati in late 1999</li> <li>❑ Megawati is a conservative woman, but is significantly constrained by the political limitations of heading a coalition govt</li> </ul>

Source: Research for the DFID KARS *Energy, poverty and sustainable urban livelihoods*

**Table 2.2: Case-study characteristics**

Ghana	Guizhou province – China	Indonesia (Jakarta)
<p><b>Mossi Zongo (Kumasi)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Very diverse population (20,000)</li> <li><input type="checkbox"/> Originated in response to post-WWII migration (esp from Burkina Faso)</li> <li><input type="checkbox"/> Strong sense of community</li> <li><input type="checkbox"/> One of Kumasi's poorest communities</li> <li><input type="checkbox"/> Unemployed or low wages: unskilled labourer, hawkers, petty-traders</li> <li><input type="checkbox"/> Strong security of land</li> <li><input type="checkbox"/> Very marshy land (roads often flood – isolating community from city)</li> <li><input type="checkbox"/> Piped water exists (buy from water vendors), but other infrastructure is weak (e.g. sanitation, school, health)</li> <li><input type="checkbox"/> High crime</li> </ul>	<p><b>Ruban area</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> mix of diverse people</li> <li><input type="checkbox"/> highly mobile population</li> <li><input type="checkbox"/> enterprise employees (urban registration)</li> <li><input type="checkbox"/> peasant farmers (rural registration)</li> <li><input type="checkbox"/> 'Urban gleaners' (rubbish collectors, porters, builders and vegetable pedlars – rural registered but living in the city)</li> <li><input type="checkbox"/> urban and rural administration units</li> <li><input type="checkbox"/> Case study factory</li> </ul>	<p><b>Kelurahan Kramat</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> located in central Jakarta</li> <li><input type="checkbox"/> very densely populated</li> <li><input type="checkbox"/> close to commercial centre</li> <li><input type="checkbox"/> electronics vendors</li> <li><input type="checkbox"/> poor sewage and drainage</li> <li><input type="checkbox"/> predominately non-registered migrants</li> <li><input type="checkbox"/> migrants push indigenous (Betwai) out of the area – social competition</li> <li><input type="checkbox"/> very high crime and other social probs (drugs, prostitution, gambling)</li> </ul>
<p><b>Chorkor (Accra)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Large population 26,000</li> <li><input type="checkbox"/> Extreme density</li> <li><input type="checkbox"/> Mix of migrants and Ga-Adangbe's</li> <li><input type="checkbox"/> Fishing community</li> <li><input type="checkbox"/> Strong sense of community</li> <li><input type="checkbox"/> Good infrastructure (e.g. electricity, water pipes, schools, clinics) but no drainage or sanitation systems</li> <li><input type="checkbox"/> Geographical divided into two classes: high income ('the estate' – owned sandcrete houses) and low income (rented informal housing, poor access to roads)</li> </ul>		<p><b>Kelurahan Gedong</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> located in southeast edge of Jakarta</li> <li><input type="checkbox"/> close to Jakarta's main bus station</li> <li><input type="checkbox"/> adjacent to modern military complex</li> <li><input type="checkbox"/> 55% work in formal sector; 38% in informal sector; 7% unemployed</li> <li><input type="checkbox"/> most residents are migrants</li> <li><input type="checkbox"/> settlement divided by river and ring road – therefore very separate enclaves exist</li> <li><input type="checkbox"/> mix of (separate) high density poor areas (slums and informal stalls) and middle class areas (modern housing and offices)</li> <li><input type="checkbox"/> slum areas: no sewage or drainage</li> <li><input type="checkbox"/> low crime rate, no identified drug prob</li> </ul>

Source: Research for the DFID KARS Energy, poverty and sustainable urban livelihoods.

## **Chapter THREE: Findings<sup>7</sup>**

### **The Energy/Urban Poor Relationship**

In Ghana and Indonesia the economic crises of the late 1990s, and in Guizhou province the economic and environmental situation, as shown in table 3.1, have directly affected energy policy. In turn, as indicated in table 3.2, this has had both direct and indirect impacts on the availability of energy for the urban, and in China also the rural poor. Table 3.3 provides a more detailed picture of the coping strategies adopted by households, as well as demonstrating how household assets and overall livelihoods have been affected by macro policies, and in the case of China macro policies and meso strategies.

### **The impact of energy related policies, institutions and processes on poor households**

#### **Energy and energy related policies**

All the study countries, as shown in table 3.1, undertook, in response to economic and environmental pressure, changes to energy and energy related policies. Ghana and Indonesia responded to national financial crises and debt burdens by changing the cost of energy and mix of energy subsidies. In Ghana, the government increased the cost of petroleum by 64% and electricity by 96%. In Indonesia, prior to the 1997 crisis, domestic energy products – motor gasoline, kerosene, diesel oil, and fuels oils as well as electricity - were heavily subsidised. The dominance of these subsidies ensured that domestic market costs failed to sufficiently cover the cost of production, and the mix of subsidies heavily distorted the domestic market. In 1997 these subsidies were reduced and restructured.

**Table 3.1: Policy, institutions and processes (PIPs)**

	<b>Ghana</b>	<b>Guizhou province – China</b>	<b>Indonesia</b>
<b>Selected energy and energy related policies</b>	<ul style="list-style-type: none"> <li>❑ Increase in price of energy to cover supply company costs. Electricity doubled in cost, petroleum and kerosene more than doubled in cost</li> <li>❑ Policy of stepped tariff related to volume of electricity consumed</li> </ul>	<ul style="list-style-type: none"> <li>❑ Improvement in environmental quality through mandated standards for energy processes</li> <li>❑ 'One country – two policies' different treatment of urban and rural residents</li> </ul>	<p>Pre-crisis</p> <ul style="list-style-type: none"> <li>❑ Two decades before crisis <i>domestic BBM</i> and electricity heavily subsidised. Result:               <ol style="list-style-type: none"> <li>1. domestic cost did not cover production</li> <li>2. distorted domestic market</li> </ol> </li> <li>❑ Poorly targeted subsidies – aimed at poor but urban middle class and wealthy benefit most</li> </ul> <p>Post-crisis</p> <ul style="list-style-type: none"> <li>❑ Change in balance of subsidies on fuel types</li> <li>❑ Reduction of subsidies thus gradual increase in fuel costs</li> </ul>
<b>Institutions</b>	<ul style="list-style-type: none"> <li>❑ Ministry of Energy</li> <li>❑ Electricity Generating Company</li> <li>❑ Public Utility Regulatory Commission (PURC)</li> </ul>	<ul style="list-style-type: none"> <li>❑ Donors</li> <li>❑ Central government</li> <li>❑ Provincial government</li> <li>❑ Municipal government</li> <li>❑ Companies and enterprises</li> <li>❑ Street and village communities</li> </ul>	<ul style="list-style-type: none"> <li>❑ Central government</li> <li>❑ Provincial government</li> <li>❑ Ministry of Mines and Energy</li> <li>❑ KONEBA (energy SOE)</li> <li>❑ Agency for Assessment and Application of Technology (BPPT)</li> <li>❑ Master Plan of National Energy</li> <li>❑ Companies and enterprises (e.g. oil)</li> <li>❑ Village administration (chief - 'lurah')</li> </ul>
<b>Processes and trends</b>	<ul style="list-style-type: none"> <li>❑ Users charged according to estimated volume consumed</li> <li>❑ Raised unit cost of electricity</li> <li>❑ Raised unit cost of petrol</li> </ul>	<ul style="list-style-type: none"> <li>❑ Reduced use of coal by domestic users</li> <li>❑ More efficient use of coal by enterprises</li> <li>❑ Inequity between rural and urban residents regarding availability of energy</li> </ul>	<ul style="list-style-type: none"> <li>❑ Increase in cost of kerosene</li> <li>❑ Increase in cost of electricity</li> </ul>

N.B. *Bahan Bakar Minyak* products: motor gasoline; kerosene; automotive diesel oil; industrial diesel oil; and fuel oils. Source: Research for the DFID KARS *Energy, poverty and sustainable urban livelihoods*

**Table 3.2: Energy and poor households - summary**

	<b>Ghana</b>	<b>Guizhou province – China</b>	<b>Indonesia</b>
<b>Pattern of energy use by poor</b>	<ul style="list-style-type: none"> <li>❑ Almost all use kerosene and charcoal for cooking</li> <li>❑ Poor group together to share cost of electricity connection.</li> <li>❑ In shared accommodation, high tariffs cause conflict over payment</li> <li>❑ Despite high electricity tariffs, users suffer frequent power cuts (often lasting 3 days)</li> <li>❑ Poor avoid disconnection because this incurs penalty and reconnection fee</li> </ul>	<ul style="list-style-type: none"> <li>❑ For cost reasons all use coal</li> <li>❑ Employees (urban )use coal for heating during winter and coal gas and electricity for cooking</li> <li>❑ Rural group used use coal for heating and cooking – no infrastructure for gas – may use liquefied gas</li> <li>❑ Rural residents may use firewood</li> <li>❑ Higher the income higher consumption of energy</li> <li>❑ Lower the income greater the proportion spent on energy – research showed between 30-50% of income of poor families spent on energy</li> <li>❑ Lower the income the lower the amount of energy used</li> <li>❑ Income over RMB 500 monthly spent less than 10% on energy</li> <li>❑ Use of energy determined, in part, by ‘internal living environment’ i.e. physical assets – character of house. e.g. rural poor have no bathroom – use less energy to heat water for personal cleanliness</li> </ul>	<ul style="list-style-type: none"> <li>❑ Kerosene dominant but declining – mid-80s 90% of hh consumption; 1998 70% of consumption</li> <li>❑ In house energy used for:               <ol style="list-style-type: none"> <li>1. cooking 63.8%</li> <li>2. lighting 23.3%</li> <li>3. entertainment 7.9%</li> <li>4. business 0.8%</li> <li>5. other activities 4.3%</li> </ol> </li> <li>❑ Kerosene used for cooking and some lighting</li> <li>❑ LPG very limited but infrastructure costs too high so not a viable alternative</li> <li>❑ Electricity available in urban areas</li> </ul>

	<b>Ghana</b>	<b>Guizhou province – China</b>	<b>Indonesia</b>
<b>Impact of PIPs on poor households</b>	<p>Impact of increased energy prices on energy usage:</p> <ul style="list-style-type: none"> <li>❑ not affected charcoal use, but reduced level of kerosene use</li> <li>❑ Firewood is now increasingly used – cheaper than kerosene and charcoal</li> <li>❑ Cook only two meals a day</li> <li>❑ Reduction in use of electrical appliances (e.g.radios)</li> <li>❑ Only use iron for very special occasions (e.g. church)</li> <li>❑ Stepped tariff means a group of poor users quickly arrive at the more expensive unit cost rate and therefore quickly pay more than rich.</li> </ul> <p>Direct impact</p> <ul style="list-style-type: none"> <li>❑ Increase in cost of electricity, kerosene and petroleum</li> </ul> <p>Indirect impact</p> <ul style="list-style-type: none"> <li>❑ Increase in cost of all goods (including processed foods and services)</li> </ul>	<ul style="list-style-type: none"> <li>❑ No infrastructure for gas/ They therefore continue to use coal</li> <li>❑ Enterprise employees as urban residents enjoy some energy benefits which are not available to rural residents (subsidised electricity prices and access to coal gas)</li> <li>❑ Anticipated environmental improvement through industrial energy efficiency not always achieved - Case-study showed – decrease in SO<sub>2</sub> but increase in soot and water pollution which had negative impact on poor and vulnerable e.g. elderly</li> </ul>	<p>Direct impact</p> <ul style="list-style-type: none"> <li>❑ Increase in cost of kerosene and electricity</li> </ul> <p>Indirect impact</p> <ul style="list-style-type: none"> <li>❑ Increase in cost of all goods (including processed foods and services)</li> </ul>

Source: Research for the DFID KARS *Energy, poverty and sustainable urban livelihoods*



Both Ghanaian and Indonesian governments target energy policy to benefit the poor, yet in both cases the poor have failed to reap the benefit of this targeting. In Ghana, this is largely a consequence of the policy of stepped electricity charges, whereby the unit cost of electricity is tied to the amount consumed (i.e. the higher the amount used, the higher unit cost). Although intended to benefit low electricity consumers and thus the poor, this strategy fails to take into account the energy management strategy of the poor, many of whom share the cost of one electricity connection, in order to save money. This means that the combined electricity consumption quickly reaches the higher unit cost rate. In Indonesia it has been generally recognised that it is the wealthy, because they use significant amounts of energy, rather than the poor that benefit from energy subsidies.

Guizhou province in China has focused on improving the economy and the environment. In part: by improving the efficiency of the industrial use of energy, as demonstrated by the study factory enterprise; and in part by prohibiting mines from producing coal containing a high percentage of sulphur.

### **Impact of changed policies on poor households**

In Ghana, prior to the increase in energy costs, almost all households used kerosene and charcoal for cooking. Many also used electricity for lighting and some electrical appliances, most commonly TVs and irons. In Indonesia, the majority of energy (87%) is used for cooking and lighting, with kerosene the dominant but declining energy of preference. In the mid-1980s kerosene accounted for 90% of energy consumption, being used mostly for cooking and some lighting, but declined to 70% by 1998. This decline has occurred in line with increased use of electricity, which is available in most urban areas. However, for the urban poor, despite the availability of electricity (i.e. grids exist) its high cost ensures that kerosene remains the dominant fuel of use.

In Guizhou coal is used by households because of its relative cheapness, although the intensity of use varies. Whilst the employed urban registered group use coal for heating in the winter alongside coal, gas and electricity for cooking, rural households rely solely on coal for both heating and cooking. They do not possess the infrastructure for piped gas,

## BOX A

### Hambali's household – Kelurahan Kramat, Jakarta, Indonesia

Hambali, (36), is one of the monetary crisis's victims. Before the crisis he was a security guard. He lost his job but then, in 2000, got a job as a guard in another company. Unfortunately, after 1 year he was fired again. Now he plants his yard with vegetable and fruit trees that he can sell and relies on his farm and other part time jobs to provide a living. Hambali earns Rp 300,000 (appr US\$ 40) a month from his part time jobs.

With his 32 year old wife, and two children, Hambali lives in a big house (12 by 25 sq. metres) built on land that his parents left him. The house is a semi permanent construction made half of masonry and half plaited bamboo, with cement floors, and an asbestos-tiled roof. They get fresh water from a well and pump the water into their bathroom and toilet. The pathway to the house is not paved and becomes muddy in the rain. Access to main road is about 500 to 1,000 meters and sometimes become a problem for them when raining. Electricity was a problem for them because they live in an isolated area. PLN<sup>8</sup> East Jakarta Branch refused to install an electricity connection whilst a good complex in front of their house enjoys it. But because his area is located in the border between East Jakarta and West Jakarta, he applied for an electricity connection from PLN West Jakarta branch using someone else's KTP<sup>9</sup>. Now, they enjoy electricity at the house and pay around Rp 20,000 (appr US\$ 2.67) a month.

His neighbourhood, Poncol, is isolated from others areas because of the Rindam military compound. An alternative way to get out and in to his area is using a 75 meter wooden suspension bridge across Ciliwung River but people are afraid to cross the bridge at night. If there is an activity in the military compound people from Poncol have to wait until the activity is done. Once, the government made an alternative road through the outer side of the compound, but the people in the compound felt that the road disturbed their activities so they closed it. This condition makes it is hard for Poncol's people to get access to the outside.

Hambali's oldest child is 12 years old now, while the youngest is 6 years old. Both of them are still in primary school. Because school fees are relatively cheap, Hambali does not have any problems sending his children to school. Hambali graduated from high school while his wife dropped out of vocational school when she was in her second year.

Both Hambali and his wife seldom participate in any social activities in their neighbourhood. His wife sometimes helps her neighbour in Posyandu weigh babies. She is in a weekly arisan for Rp 5,000 (appr US\$ 0.67) a week. Forty women are in the arisan, which means when a member wins she get Rp 200,000 (appr US\$26.67). She considers the arisan as her savings. If Hambali's family does not have cash, sometimes they will borrow from their parents or brothers and sisters. They think that debt from the family is flexible and easy for them to pay back.

In 1996, before the crisis, sometimes she served meat with rice to her family. After the crisis her husband was fired, and they do not eat meat now unless in Iedul Adha<sup>10</sup>. However, the family enjoys vegetables and fruits everyday that they get from their yard. Despite this supply, she still spends at least Rp 9,000 (appr US\$1.2) a day for cooking needs.

After Hambali was fired, his wife used fire wood for cooking except when it rained because the wood was wet. She uses fire wood at least 3 days a week because, in her opinion, the quality of food she cooks is better when she uses fire wood. She buys 2 litres kerosene in one day if she uses it. Kerosene prices in Poncol is higher than outside Poncol. She has to pay for Rp 700 a litre while from retailer outside Poncol, she can get kerosene for Rp 600 (appr US\$ 0.08) a litre. When they do not have money, she only uses fire wood.

If a family member gets sick, Hambali takes them to the general doctor or Puskesmas. Nevertheless, before seeing the doctor they try to buy medicine in drugstore first, if their condition is not going well, then they will see a doctor.

Source: Indonesia partner report

although they may use liquified gas, and in addition some households use firewood. In terms of energy costs, the lower the household income, the greater the proportion spent on energy. The research showed that poor families (less than RNB 500 per month) spend between 30-50% of their income on energy, whereas those with income over RNB 500 per month spend less than 10%. In China the use of energy is determined in part by the 'internal living

environment' of the home. For example, as the rural poor have no bathrooms they bathe less frequently and tend therefore to use less energy than enterprise employees (the urban poor) to heat water.

The energy policies of all three countries had, and continue to have, a direct and indirect (e.g. the increased cost of food, travel and clothes) impact on the livelihoods of the poor. As most poor households have little elasticity in their household budget such increased energy prices force families

to heavily reduce all expenditures and prioritise expenditure on the provision of essential food and energy for food preparation.

In the case of Ghana and Indonesia the poor pay more for energy as well as

paying more per unit of consumption for other goods, such as food and services. In China the status of the rural poor means they are not entitled to access the coal gas network thus refusing them the right to cleaner energy even if they could afford to use it. The rural poor in China also continue to use coal because of a failure to fully comprehend the environmental consequences of coal use. Furthermore, households that change away from using

coal tend to pay more for their non-coal energy, thus discouraging the poor from making this transition. The urban poor who have access to the coal gas network have the double benefit of a cleaner environment and not having to carry coal.

In Guizhou, the cleaner air anticipated as a gain from more efficient use of energy by the study factory appears to have been only partially achieved. Although these environmental effects have not yet been scientifically measured, the perceptions of local residents indicate a decline in SO<sub>2</sub> alongside increased presence of soot, which can be seen to be polluting water and land, and also making houses much dirtier. This new pollution has major costs, discussed in detail below, for poor household

#### **BOX B**

##### **A 40 year old charcoal seller in Moshie Zongo**

A 40-year old woman, who has been selling charcoal for the past 22 years recounted that she used to sell her charcoal at ₺1,000 a bag some 8 years ago. The price gradually but steadily shot up to ₺2,000, and then ₺7,000 over the last 5 years<sup>11</sup>. The husband also produces charcoal in the bush for sale. Charcoal now sells at between ₺15,000 and ₺17,000 a bag. In the past they made enough profit to buy food and pay school fees but now they only break even and are not able to pay the school fees of their children. The reason for this is the high fuel prices. The wood for burning charcoal is also expensive. They prepare waybills and other documents to cover the wood, and pay income tax.

This woman who considered herself rich 2 years ago says she is now in debt. She has 4 children, and lives with her husband. She sells only charcoal and has no other source of income. She is unable to sell even a bag of 100kg of charcoal a day and she is planning to find money to start a new job. Two of her children have left school because she could not afford to pay their fees. Her customers also claim that the cost of charcoal is too high. Some years ago (2 years) the customers were not complaining but today they are. She and her husband can no longer go to their hometown because they cannot afford the lorry fare. They live in a rented house with their children and the rent is ₺10,000 a month. Last year, they were paying ₺1,500 a month for electricity but they now pay ₺15,000 a month. She uses charcoal twice a day for cooking, the first for heating water and the other for cooking in the evening.

Source: Ghanaian partner report

#### ***Long and short term objectives***

The study clearly shows that households' long-term aspirations and investment have been curtailed by the initial shock of energy price rises, and in Guizhou the environmental impact of energy change, and the longer-term stress of coping with these changes. Aspirations of well-educated children and access to a variety of pleasures, a comfortable life for older persons, and access to labour saving equipment have been sacrificed. Households have been forced by the impact of the changed environment to concentrate instead on their short-term objectives – accessing sufficient food, energy and clothing to survive as a family unit. Even achieving these short-term objectives has

placed households under considerable strain. This strain is experienced differentially by men, women, children and other vulnerable groups such as older people or the physically or mentally challenged. Women have had to work longer hours to find cheaper fuel and food and to manage its collection and preparation. Men have had to spend longer hours looking for work or where work is available longer hours to generate enough money. Children have had their education disrupted. Older people have had to struggle to survive and in some cases have had their lives disrupted by relocation to the country.

### ***Coping strategies***

Poor households have adopted three main types of strategies to accommodate the impact of increased direct and indirect

energy costs on their already limited household budgets. Firstly, they have changed the type of energy they use, switching to cheaper options. This has involved a shift down the energy ladder. In Ghana households reduced their use of kerosene and increased their use of fuel-wood (a cheaper option), but did not significantly reduce their use of charcoal. In Indonesia there has been a reduced use of both electricity and kerosene. China has not yet been affected by significant increases in energy but a similar effect has been noted in the poorest of the respondents.

Secondly, poor households have reduced their overall consumption of energy in a variety of ways. In both Ghana and Indonesia they have reduced the number of meals cooked per day from three to one or two. Poor households have also switched to cheaper, usually less nutritious, food and in extreme cases reduced the amount of food consumed. Furthermore, in all three country's the poor have limited their electricity consumption by going to bed earlier as well as limiting their use of television and other electrical appliances such as irons and radios.

Thirdly, the poor have reduced their expenditure on non-energy goods. For example, in both Ghana and Indonesia, poor households have withdrawn children from school, and in Indonesia some children and older persons have been sent to extended families in the country.

Furthermore, poor households have stopped purchasing large durable items, such as fridges, and in some cases have old

**Table 3.3: Impact of energy changes on poor household assets, strategies and livelihood sustainability**

	<b>Ghana</b>	<b>Guizhou Province - China</b>	<b>Indonesia</b>
Assets	<p><b>Social</b></p> <ul style="list-style-type: none"> <li>❑ Depletion – conflict breakdown of relationships over electricity issues</li> <li>❑ Failure to invest can't afford travel to extended family</li> <li>❑ Failure to invest can't afford participation in social events</li> </ul> <p><b>Physical</b></p> <ul style="list-style-type: none"> <li>❑ Stop using electrical appliances, stop buying as cannot afford to run equipment</li> </ul> <p><b>Natural</b></p> <ul style="list-style-type: none"> <li>❑ Reduction in consumption of charcoal</li> <li>❑ Some switching to wood therefore pressure on natural resource</li> </ul> <p><b>Financial</b></p> <ul style="list-style-type: none"> <li>❑ Depletion of savings</li> <li>❑ Increased expenditure due to increased costs</li> </ul>	<p><b>Social</b></p> <ul style="list-style-type: none"> <li>❑ Caused conflict between urban and rural status households</li> </ul> <p><b>Physical</b></p> <ul style="list-style-type: none"> <li>❑ Soot has impact on house – makes cleaning difficult</li> <li>❑ Rural residents have no access to piped gas infrastructure therefore depend on coal or LPG</li> </ul> <p><b>Natural</b></p> <ul style="list-style-type: none"> <li>❑ Pollution of soil, crops and water by soot. Therefore depletion of natural resources</li> </ul> <p><b>Financial</b></p> <p><b>Rural</b></p> <ul style="list-style-type: none"> <li>❑ Depletion because of buying water</li> <li>❑ Less income because of inability to sell pollution damaged vegetables</li> </ul>	<p><b>Social</b></p> <ul style="list-style-type: none"> <li>❑ Failure to invest – cannot afford goods towards daughter's wedding</li> <li>❑ Failure to invest – can't afford to participate in social activities including gifts for wedding</li> <li>❑ Can't afford transportation costs therefore fail to visit extended family</li> </ul> <p><b>Physical</b></p> <ul style="list-style-type: none"> <li>❑ Sell house to pay for living</li> <li>❑ Let rooms in house</li> <li>❑ Sell large durable goods</li> <li>❑ Don't maintain house</li> </ul> <p><b>Natural</b></p> <ul style="list-style-type: none"> <li>❑ Increased reliance on natural assets (e.g. land to grow food) for personal consumption and income-generating</li> </ul> <p><b>Financial</b></p> <ul style="list-style-type: none"> <li>❑ Depletion of savings</li> <li>❑ Increased expenditure due to increased costs</li> </ul>

such items to generate more cash. In addition, many households in Indonesia have accepted lodgers or sold homes (thus becoming lodgers themselves) in order to generate sufficient income to survive and continue sending children to school. Most have stopped spending on recreational activities, including travelling to visit friends and relatives and entertaining or partaking in other social activities such as weddings and funerals, in order to save the cost of travelling and the cost of gifts.

In China, the perceived negative impact of soot pollution from the study factory has led households to either purchase potable water or walk long distances to obtain clean water. Unfortunately, the most vulnerable are unable to adopt either strategy through lack of funds and/or inability to carry water long distances, and are therefore forced to drink water perceived to be polluted.

### **Impact on assets**

The coping strategies adopted by poor households, as outlined above and in table 3.3, are having dire effects on household assets.

There is ample evidence from Ghana and Indonesia of a failure to invest in **social** capital. For example, families can no longer afford to visit family and friends or take part in the social activities, such as providing gifts and participating in weddings, which build social capital. In addition, social capital in Ghana is further depleted by the breakdown of relationships resulting from conflict over the management of electricity bills. In China the energy intervention resulted in 'tense' relations between the factory employees and rural farmers.

The **physical** assets of households are being depleted in all three countries. There is deterioration in the quality of housing through lack of maintenance, and in extreme cases houses are being sold in Indonesia. In addition, durable goods are not being purchased and many are being sold. In China, rural residents within the Ruban area do not have access to piped gas infrastructure and houses require much more maintenance because of the soot.

In Ghana and the *Kelurahan Gedong* area of Jakarta there is increasing pressure on **natural** assets as more fuelwood is cut to meet the growing demand from households unable to afford

kerosene. Within the Ruban area soil, crops and water are being polluted by soot. In Indonesia there is increased reliance on natural resources, such as land to grow food for personal consumption and income generation.

Households in all three countries have experienced a reduction in **financial** resources as savings have been used to cope with the shock and stresses of increased energy costs. For example, within the Ruban area finances are used to purchase potable water, while financial returns from farming for rural residents are not being realised as vegetables polluted by soot cannot be sold.

In all three case-studies there is a decline in **human** assets. This results from a decline in health because of poorer nutrition; inability to afford medicines and medical treatment; more expensive cooking fuel which means a reduction in cooked meals (Indonesia) and polluted water (China); as well as the long-term consequences of withdrawing children from school.

### **Livelihood outcomes**

With families experiencing a reduction in all assets, their livelihoods have become increasingly vulnerable. They are therefore less prepared to cope with future shocks and stresses, and it is likely they will be more susceptible to ill-health. With constrained educational opportunities it seems probable, unless this situation can be changed, that these families have little hope of improving their situations. Not only are households failing to thrive, but in Ghana, and to a lesser extent Indonesia and China, their current livelihood is unsustainable unless their ability to access affordable cleaner forms of energy changes.

## **Chapter Four: Conclusions**

### **Ways in which does energy supply and usage impact upon the livelihoods of the urban poor**

This research shows that energy is significant for the livelihoods of the urban poor. Using a sustainable urban livelihood framework to structure the analysis it was possible to show just how energy supply and use affected the various components: men and women's objectives; assets; and livelihood strategies of poor livelihoods. The nature of the relationship between energy and livelihoods is summarised in chapter 2.

The study clearly shows that households' long-term aspirations and investment were curtailed, in Indonesia and Ghana by the shock of energy price rises and in Guizhou, China by the environmental impact of an energy intervention project. Poor households adopted three main strategies to accommodate these energy changes: switching to cheaper energy options; reducing the overall consumption of energy and reducing their expenditure on non-energy goods. As shown in Table 3.3 energy changes which households had to accommodate had a dire effect on their assets and resulted in increased vulnerability for all the poor households.

### **The value of the SUL framework as an analytical tool**

The sustainable urban livelihood framework was a very useful instrument for unpacking the macro-meso-micro energy linkages. As explained in chapter two the focus of analysis in Indonesia and Ghana was on understanding the macro-micro relationship. It was possible, using the sustainable urban livelihoods framework to unpack the link between changes in macro policies and urban livelihoods, showing that all the livelihoods of the study households became more vulnerable as a result of policy changes. The China (Guizhou province) study explored the macro-meso (government/meso level-industrial enterprise) relationships and meso-micro relationships (provincial level-micro) relationships. This demonstrated the importance of analysing the impact of the macro-meso relationship (a policy on improved boiler energy efficiency for economic and environmental reasons at the industrial level) on the micro

(household level). Quite often this relationship is either ignored or thought to be benign. It is also quite difficult to prove on a scientific basis due to many confounding variables. However, the SUL provides a tool for discussing the perceptions of households perceive they have been affected.

The SUL framework was a valuable and robust analytical tool for unpacking the energy-poverty relationship.<sup>12</sup> It provides a set of elements against which to systematically assess the impact of: contextual variables; as well as policies, institutions and processes; on the livelihoods of poor urban households<sup>13</sup>.

It was a useful tool for demonstrating the impact of policies, institutions, and processes (PIPs) on poor urban households. However, it did not indicate the severity of these impacts, but merely mapped them.

It was also useful for identifying common patterns across the three study countries, particularly in how coping strategies and assets change in response to shocks, stresses and interventions. Its value in this regard is demonstrated in the many comparative tables included in this paper.

Furthermore, the SUL framework provided a valuable structure for aiding dialogue and understanding between energy and social development poverty focused stakeholders at government, consultant, academic and community levels. The poverty and development experts became increasingly aware of the importance that poor households placed on access to energy. And in turn, energy experts were quickly able to see the potential and actual implications of a change in energy policy or the introduction of an energy project on poor household's assets and strategies.

## BIBLIOGRAPHY

Banister A, Spring 2002, 'Energy, poverty and sustainable urban livelihoods – a tool for the future?', *Boiling Point*, No 48, International Technology Development Group

Barnes D., Van der Plas R., & Floor W., June 1997, 'Tackling the Rural Energy Problem in Developing Countries', *Finance and Development*,

Barnes D et al., 1998, *The Urban Energy Transition: Energy, Poverty and the Environment in the Developing World*. World Bank draft report, unpublished. In R7182 Literature Review

Bruce N, undated, *Public Health and Household Energy*, SPARKNET  
[<http://www.sparknet.info/goto.php/qv/th.health/theme.htm> – accessed 08/02]

Carney D (ed), 1998, *Sustainable Rural Livelihoods*, DFID: London

Chambers R & Conway G, 1992, *Sustainable rural livelihoods: practical concepts for the 21st century*, IDS discussion paper No 296, IDS: Sussex

Chambers R, 1995, 'Poverty and Livelihoods: Whose Reality Counts?', in *Urbanisation and the Environment*, Vol 7 No 1

Department for International Development (DFID), 1998, *Guidance manual on water and sanitation programmes*, HMSO: London

Department for International Development (DFID), 1999, *Energy for the Rural Poor*, DFID Guidance note

Department for International Development (DFID), 1999, *Sustainable Livelihoods and Poverty Reduction*, Background briefing, HMSO: London

Department for International Development (DFID), 2000, *Sustainable Livelihoods Guidance Sheets: Methods*, DFID: London

Department for International Development (DFID), 2002, *Energy for the Poor - Underpinning the Millennium Development Goals*, DFID Issue Paper, HMSO: London

Department of the Environment, Transport and the Regions (DETR), 2000, *The air quality strategy for England, Scotland, Wales and Northern Ireland: working together for clean air*, presented to Parliament by the Secretary of State for the Environment, Transport and the Regions by Command of Her Majesty, London: The Stationary Office.

Drake L, 2000, *Scoping Mission to investigate the development of Livelihoods Indicators and Livelihoods Monitoring Systems for DFID-Bangladesh*

Goldemberg J. Reid W (eds.), 1998, 'Issues and Options; The Clean Development Mechanism', in United Nations Development Programme, 2000, *World Energy Assessment: Energy and the Challenge of Sustainability (The WEA Report)*, UNDP: Department of Economic and Social Affairs, World Energy Council, [edited by José Goldemberg]

Goldemberg J. and Reid W (eds.), 1999, 'Emissions: Trends and Baselines', in United Nations Development Programme, 2000, *World Energy Assessment: Energy and the Challenge of Sustainability (The WEA Report)*, UNDP: Department of Economic and Social Affairs, World Energy Council, [edited by José Goldemberg]

Hoon P, Singh N, and Wanmali S, 1997, *Sustainable Livelihoods: Concepts, Principles, and Approaches to Indicator Development*, Sustainable Livelihoods Programme, UNDP  
[[http://www.undp.org/sl/Documents/Indicators\\_and\\_eval/SL%20concepts/sl\\_concepts,\\_principles\\_and\\_approaches\\_to\\_indicator\\_development.htm](http://www.undp.org/sl/Documents/Indicators_and_eval/SL%20concepts/sl_concepts,_principles_and_approaches_to_indicator_development.htm) – accessed on 18/07/02]



- Hosier R. H and Kipondya W, 1993, 'Urban Household energy use in Tanzania: Prices, Substitutes and Poverty', *Energy Policy*, Vol 21 Issue 3, pp454-472 in R7182 Literature Review.
- Howorth, 1996, in United Nations Development Programme, 2000, *World Energy Assessment: Energy and the Challenge of Sustainability (The WEA Report)*, UNDP: Department of Economic and Social Affairs, World Energy Council, [edited by José Goldemberg]
- Hussein K, 2000, *Monitoring and Evaluating Impact on Livelihoods: Lessons from Experience*, final draft, Rural Policy and Environment Group, ODI: London  
[<http://www.livelihoods.org/post/Docs/hus-ME01.rtf> – accessed on 18/07/02]
- Kleiburg R, Shell Renewables, 2002, *Speech at 'Power to the People' Seminar*. ITDG, SOAS: London
- Li Shi et al, 2000, *An Empirical Analysis of Chinese Residents' Income Distribution*, China Social Science Literature Publishing House
- Lu Xueyi (ed), 2001, *Research Report on Modern China's Social Classes*, Chapter 1, Beijing: China Social Sciences Documentary Publishing House
- Mayoux L, 2002, *What do we want to know? Selecting Indicators*, mimeo, WISE  
[<http://www.enterprise-impact.org.uk/pdf/SelectingIndicators.pdf> – accessed on 18/07/02]
- Meikle et al, 2001, *Sustainable Urban Livelihoods: Concepts and Implications for Policy*, DPU Working Paper No 112, Development Planning Unit: UCL, London
- Mendis M.S., 2000, 'Alternative Energy Development', Chapter 10 in United Nations Development Programme, 2000, *World Energy Assessment: Energy and the Challenge of Sustainability (The WEA Report)*, UNDP: Department of Economic and Social Affairs, World Energy Council, [edited by José Goldemberg], p27
- Mohasi M & Calder R, 2001, 'Assessing Vulnerability within the TEAM project', draft. Annexure 2 in Khanya, 2000, *Monitoring and Evaluating Impacts on Livelihoods: CARE TEAM Case Study*, DFID and Khanya report, pp11-14  
[<http://www.livelihoods.org/post/Docs/kha-ME01.rtf> – accessed on 18/07/02]
- Moser C, 1996, *Confronting Crisis: A Comparative Study of Household Responses to Poverty and Vulnerability in Four Urban Communities*, ESD: Washington
- Moser C, 1998, 'The Asset Vulnerability Framework: Reassessing Urban Poverty Reduction Strategies', in *World Development*, Vol 26 No 1
- Nunan F et al, 2002, *Poverty and the Environment: Measuring the Links – A study of Poverty-Environment Indicators with Case Studies from Nepal, Nicaragua and Uganda*, Environment Policy Department, Issue Paper No. 2, DFID: London
- Pasteur K, 2001, *Tools for Sustainable Livelihoods: Livelihoods Monitoring and Evaluation*  
[<http://www.livelihoods.org/info/tools/Pas-ME01.rtf> – accessed on 18/07/02]
- Ping H et al, 2002, *Sustainable Livelihood and its relationship to energy utilization: a field report from a Ruban Area in Guiyang*, partner report
- Rashid D.A. & Westley K, 2000, *CARE/DFID Livelihood Monitoring Project: Bangladesh*, draft  
[<http://www.careinternational.org.uk/reports/LMP%20case%20study%20-%20westley%20%20rashid.pdf> – accessed on 18/07/02]
- Republic of Ghana (RoG), 2000, *Poverty Trends in Ghana in the 1990s*, Ghana Statistical Service: Accra
- Satterwaite D, 1999, *The Earthscan reader in sustainable cities*, London: Earthscan

Scoones I, 1998, *Sustainable Rural Livelihoods: A Framework for Analysis*, IDS Working Paper No. 72, Institute of Development Studies: University of Sussex

Smith N, 1998, *Low cost electrification: affordable electricity installation for low-income households in developing countries*, Intermediate Technology working papers, ITP

Turton C, with Westley K, & Goulden J, 2000, *Bangladesh: Design of a Livelihood Monitoring System*, In Development Ltd (IDL), for DFID: London

Turton C, 2001, *Livelihood Monitoring and Evaluation: Improving the impact and relevance of development interventions*,

[<http://www.livelihoods.org/post/Docs/tur-ME01.rtf> – accessed on 18/07/02]

United Nations Development Programme (UNDP), 1992, *Conference on Environment and Development*, Rio de Janeiro: Brazil

United Nations Human Settlement Programme (UNCHS), 1996, *An Urbanising World: Global Report on Human Settlements*, Oxford University Press

United Nations Development Programme (UNDP), 2000, *World Energy Assessment: Energy and the Challenge of Sustainability (The WEA Report)*, UNDP: Department of Economic and Social Affairs, World Energy Council, [edited by José Goldemberg]

WEDC, 1997, *Public Private Partnerships and the Poor in water and sanitation*, Inception Report R-7388, WEDC: Loughborough University

[<http://www.iboro.ac.uk/departments/cv/wedc/projects/ppp-poor/inception2.htm> – accessed on 18/07/02]

Woodhouse P, Howlett D, and Rigby D, 2000, *A Framework for Research on Sustainability Indicators for Agriculture and Rural Livelihoods*, Sustainability Indicators for Natural Resource Management and Policy, Working Paper No.2. Collaborative project by: Development and Project Planning Centre: University of Bradford; Centre for Agricultural, Food and Resource Economics: University of Manchester; Institute for Development Policy and Management: University of Manchester; Economic Policy Research Centre: Makerere, Uganda; and Agricultural and Rural Development Research Institute: University of Fort Hare, South Africa

World Bank, 1997, *Expanding the Measure of Wealth. Indicators of Environmentally Sustainable Development*, Indicators and Environmental Evaluation Unit, Environment Department, World Bank: Washington

World Energy Council (WEC), 1999, *The Challenge of Rural Energy Poverty in Developing Countries*, London

Yin, R.K., 1984, *Case Study Research: Design and Methods*, Sage Publication, London.

## **APPENDIX A**

### **DETAILS OF PARTICIPATING PARTNERS, INCLUDING ADDRESSES**

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## APPENDIX B

### SUSTAINABLE LIVELIHOODS

#### The sustainable livelihoods (SL) approach

##### 1. Introduction

The sustainable livelihoods approach is not new. It brings together and builds on earlier approaches. It is people centred, poverty focused, and acknowledges poverty to be a dynamic process. The approach itself is dynamic and the central ideas are continually challenged. This study contributes to the development of the approach by considering the contribution of energy to the livelihoods of poor men and women.

##### 2. The SL framework

Figure 1 presents a sustainable livelihoods model. The **assets** in this model have been presented as a pentagon of five types: financial, human, natural, physical and social, as is proposed in Carney's model.<sup>1</sup> Although these generic assets are essentially the same for rural and urban models, the urban setting may result in a different emphasis for each type of asset. For example, natural capital is generally less significant in the urban setting whereas financial capital is usually more important.

The selection and design of livelihood strategies relates to **women and men's objectives** – what types of livelihood are desired and what areas of livelihood are prioritised. Livelihood strategies are, therefore, based on the values and priorities of the men and women who pursue them, rather than simply on the options and resources available to them.

**Livelihood strategies** are shaped by the combination of assets available, the urban contextual factors - including policies, institutions and processes; the vulnerability context - shocks, stresses and trends - which determine the availability of these assets, and men and women's objectives. Livelihood strategies can prioritise the interests of more powerful household members rather than the interests of all household members and thus may be inequitable; or they may be deleterious to the natural environment. In this light some strategies may be unsustainable in the longer run.

The **livelihood outcomes** of individuals or households are the results of people's success or failure in transforming, through a variety of strategies, the assets available to them into income or basic goods and services. Livelihood outcomes can be aggregated and seen in relation to their position on a continuum from vulnerability to security.<sup>2</sup> A sustainable livelihood is one which is secure and guards men and women against shocks and stresses without impacting negatively on the environment.

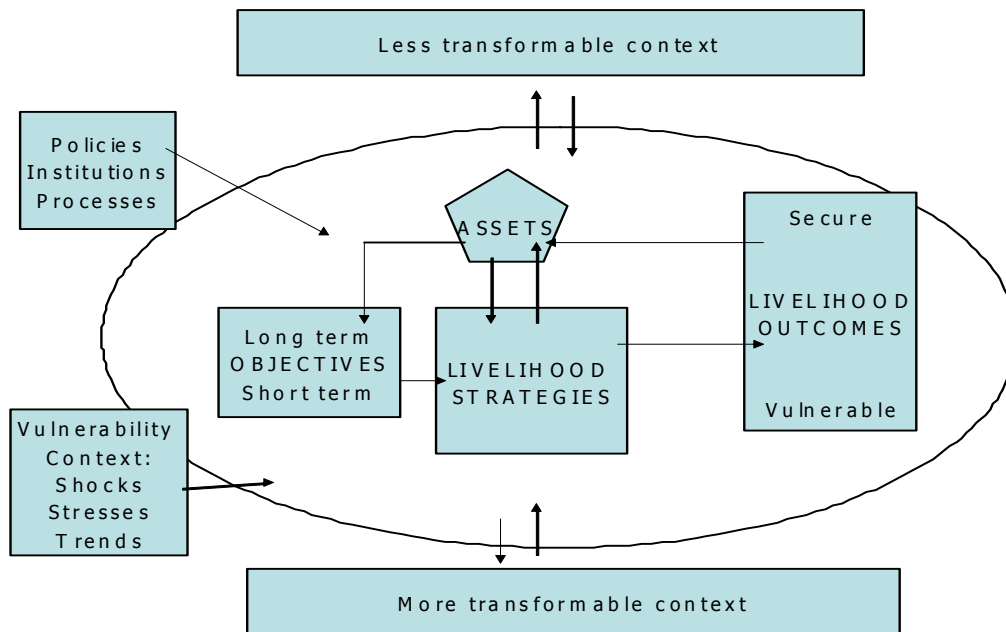
Because the **context** in which poor households pursue their livelihood strategies is a key determinant of the types of assets available to them and the types of livelihood strategies that they are likely to pursue – and thus, in the end, of the security or vulnerability of the livelihoods – it is the context which makes the sustainable urban livelihood distinctive. Poor urban men and women are likely to be vulnerable to different shocks and crises than their rural counterparts. The main sources of this vulnerability vary from city to city – but certain elements appear common to many poor urban residents. For example: their informal legal status in terms of residence, employment status and housing type; poor living environments; and a dependence on the cash economy for basic goods and services.

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<sup>1</sup> Carney, 1998

<sup>2</sup> Moser, 1998

**Figure 1: Sustainable Urban Livelihood Framework**



Assets include:

- *Human capital* – skills, knowledge, information, ability to work and health
- *Natural capital* – air, land, water, wildlife, biodiversity, environment, wood and coal
- *Financial capital* – savings, credit, remittances and pensions
- *Physical capital* – transport, shelter, water, energy and communications infrastructure
- *Social capital* – social networks, groups, trusts and access to institutions

**Source: As developed by Meikle et al for DFID, 1999 from Carney 1998**

## APPENDIX C

### ENERGY AND POVERTY

Energy has an important role in poor people's lives.

As stated by the 1992 Earth Summit '*Energy is essential to economic and social development and improved quality of life*'.<sup>3</sup> Further, as recently stated by DFID, '*Energy plays a **critical** role in underpinning the Millennium Development Goals (MDGs) and improving the lives of poor people across the world. 'The wide range of 'energy services' – cooking, water heating, lighting, refrigeration, water pumping, transport and communications – made possible by fuels and fuel technologies can have a major impact in facilitating sustainable livelihoods .....and significantly reducing poverty*'.<sup>4</sup>

#### **The contribution of energy to poverty reduction**

Energy permeates people's lives. It provides the means, directly or indirectly for achieving a sustainable livelihood. Energy services contribute towards reducing extreme poverty by facilitating economic development that directly impacts on the poor's livelihood strategies. Energy services can also enhance education prospects by reducing the time spent gathering fuel or cooking to allow for home study. It may also reduce crime by lighting streets.

However, energy services that are badly managed or denied to the poor can have negative outcomes. For example, communities and households without access to modern energy such as electricity or LPG are socially and technologically excluded.

The combustion of some fuels contributes to poor indoor and outdoor air quality, with serious consequences for health and natural resources. For example, burning biomass, charcoal and coal releases smoke and other air pollutants which particularly affect those closest to the stove (i.e. women and children). Urban outdoor pollution can be equally damaging particularly from burning fossil fuels with high levels of sulphur. Health consequences include increases in asthma and aggravation of existing heart conditions. Poor management and unsustainable use of traditional fuels can contribute to soil erosion, reduced soil fertility and desertification while the combustion of fossil fuels can contribute to acid rain and the global issue of climate change. Long term this reduces available resources for the poor.

#### **Energy Consumption Strategies**

Household energy types and consumption levels are determined by:

- Income and inter-household income distribution
- Fuel availability
- Fuel prices
- Distribution network proximity (gas and electricity)
- Cultural preferences
- Demographic distribution
- Physical environment (rural or urban)

The Energy Ladder (figure 2) represents the fuel types that might be used by households as their prosperity increases. A typical household Energy Ladder for cooking will progress from traditional fuels (in order: dung, crop residues, wood, charcoal and coal) to modern fuels (in order: kerosene, LPG and electricity)<sup>5</sup>.

The Energy Ladder's fuel order corresponds to increased technological efficiency, decreased CO<sub>2</sub>, SO<sub>2</sub>, emissions and particles, and increased capital costs.

#### **Moving around the Energy Ladder**

Although commonly assumed that progression up the ladder occurs naturally, in fact, movement is determined by factors other than affordability, such as individual preference and fuel availability.

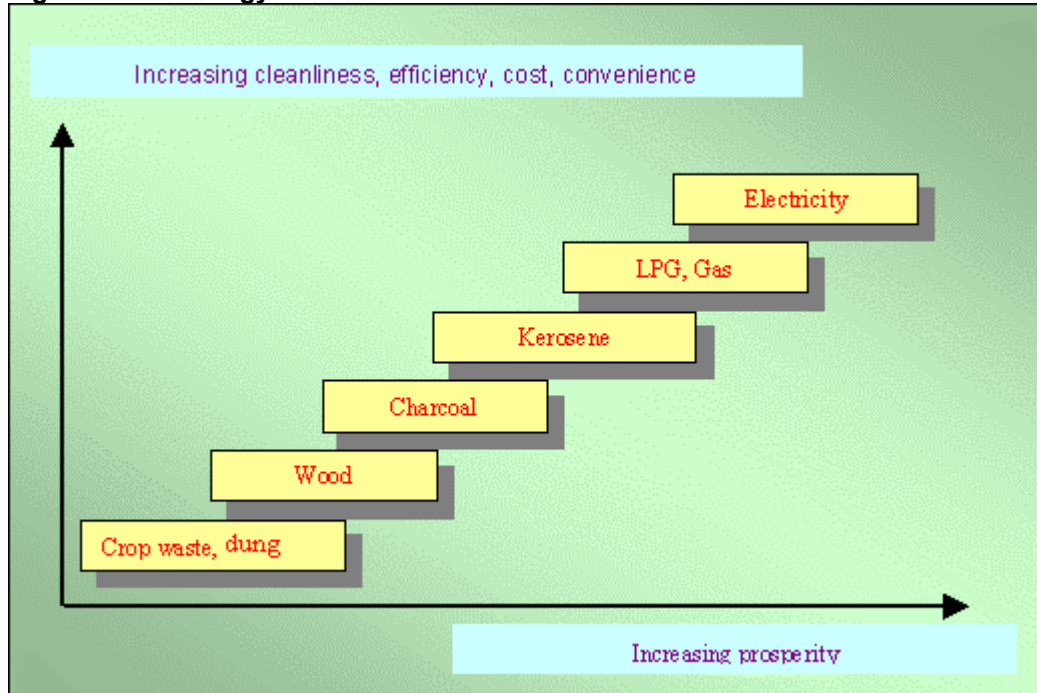
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<sup>3</sup> UNDP, 1992

<sup>4</sup> DFID, 2002

<sup>5</sup> WEA Report, 2000

**Figure 2: The energy ladder**



Source: Report on 'Public Health and Household Energy' downloaded from <http://www.sparknet.info/goto.php/qv/th.health/theme.htm>, August 2002

### **Affordability**

It is often assumed that the poor will not pay for energy services and that they do not consider it a priority. However, in real terms the poor pay more per energy unit than those using more efficient fuels and appliances,<sup>6</sup> and often spend more time and effort obtaining energy services than middle or higher income households. Clearly, affordability does affect energy choice, but it is not the sole determinant.

### **Availability**

The poor use various fuels for different purposes such as cooking, lighting and transportation. Barriers to access are economic and physical (e.g. high cost of equipment, lack of infrastructure, increasingly scarce woodfuel resources around the households) but also caused by policies and institutional processes as will be demonstrated by the China case study.

### **Preference**

Households may favour particular fuels for cultural reasons, such as its compatibility with their lifestyle, and the desired end use. For example, gas may be favoured for cooking, whereas electricity may be favoured over kerosene for lighting. Additionally, particular fuels may be favoured for their reliability and availability so as to minimise the risks of interruption for a small business. Furthermore, because of their vulnerability, poor households may prefer not to invest in the facilities of a new technology until its affordability, availability and reliability have been proven.

### **Policies on access, affordability and the consequences of using energy**

In the past few years there has been widespread liberalisation and restructuring of commercial energy markets. This has involved transition from state owned enterprises providing generation, transmission, distribution and retail sales of electricity and gas. Liberalisation has allowed these to be separated out so that private companies can provide individual functions especially in generation and retail.

<sup>6</sup> Barnes D et al, 1998, The urban energy transition: Energy, Poverty and the Environment in the Development World, unpublished

Although such restructuring can reduce costs of generation and enable expansion of supply (e.g. into rural areas),<sup>7</sup> in the absence of any regulatory mechanism and/or real competition, it leaves prices at the mercy of market forces rather than state policies.

Past macro level policies have focused on:

- ❑ widening access to reliable and affordable modern energy services;
- ❑ addressing negative health and environmental impacts of energy use; and
- ❑ enhancing security (the availability of energy in sufficient quantities at all times and in various forms, at reasonable prices);
- ❑ provision of the means of generation.

However, the implementation of macro level energy policies such as pricing, supply and regulation have significant social impacts. Therefore existing energy policies require co-ordination with economic growth, environmental protection and social development policies.

It is therefore critical to ensure policy makers are aware of the potential consequences of their decisions on poor households, and also the need to give a 'voice' to affected communities in energy decision-making.

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<sup>7</sup> Goldenburg, 1999



## ENDNOTE

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<sup>1</sup> Winarso, Partner Report, 2001

<sup>2</sup> Since the 1950s China has experienced economic growth and since the 1970s this has been at a high rate. This growth has been achieved with “high input, high energy consumption, and high pollution”. (Ping: 2001) At the same time the income gap between regions and people has been increasing. (Li Shi, 2001, cited in Huang Ping

<sup>3</sup> Huang Ping, Partner Report, 2002

<sup>4</sup> There are 8.1 RNB (the official currency) to 1 US\$

<sup>5</sup> Huang Ping, Partner Report, 2002

<sup>6</sup> Lu Xueyi, ed, 2002, Research Report on Modern China’s Social Classes, Chapter 1, 2001, Beijing: China Social Sciences Documentary Publishing House, cited in Huang Ping Partner Report

<sup>7</sup> Unless otherwise stated these findings are drawn from the fieldwork in Indonesia, Ghana and China

<sup>8</sup> *Perusahaan Listrik Negara* or Indonesia Electricity Company.

<sup>9</sup> *Kartu Tanda Penduduk* or identification card of Indonesian citizens.

<sup>10</sup> An Islamic holy day that requires a feast of sacrifice goats or cows especially for poor people.

<sup>11</sup> This is not only caused by energy price rises but is also a consequence of general inflation

<sup>12</sup> The nature of the SUL framework is summarised in Appendix

<sup>13</sup> A fuller description of the value of this tool in relation to the Ghana case-study can be found in Banister, Alison, Energy, poverty and sustainable urban livelihoods – a tool for the future?, Boiling Point 48 Spring 2002