



ICT and Sustainable Development

Dr Peter Hopkinson and Professor Peter James
University of Bradford & SUSTAIN-IT
Second SMIA Conference Geneva Sept 2005



Scope of presentation

- Why ICT and Sustainable Development (SD)
- Issues and challenges
- Some examples: 3 examples to illustrate approach and key question – are ICT developments in specific areas positive or negative for SD ?



Why ICT and Sustainable Development

“we are experiencing a period of history characterized by the transformation of our ‘material culture’ by the works of a new technological paradigm organized around information technologies” (Castells, 2000)

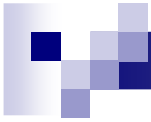
Through its reach and spread ICT is now an essential part of Sustainable Development

Creates opportunities to achieve the goals and objectives of SD



What do we mean by SD

- At its simplest: Issues around economy, poverty, health, environmental protection
- Significant Attempts to raise awareness and directions: Rio/Agenda 21: Millenium Development Goals; Johannasburg, World Summit on Information Society
- Multiple Definitions, contested term
- Many measurement frameworks eg UN, GRI, EU



Example of Sustainable Development Indicator Framework structure (UNED)

<i>Social</i>		
Themes	Sub-themes	Indicators
Equity	Poverty	Percent of Population Living Below the Poverty Line
		Gini Index of Income Inequality
		Unemployment Rate
	Gender Equality	Ratio of Average Female Wage to Male Wage



Role of ICT in Sustainable Development

- ICT offers range of functionality to impact on areas of human and economic development
- Communication and Connectivity (buying, selling, voting, help)
- Sensors and controllers (monitoring, diagnosis, forecasting)
- Databases and information (support, trends, prices, state, availability)



Some recent studies (1) ICT enabled work (telework) and Sustainable Development

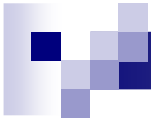
EU 5th framework Project SUSTEL

- Develop better understanding of the impact of the Information Society on Sustainable Development
- How is ICT affecting how, where and when we work
- Focus is EU



Measurement Framework

- Take existing SD frameworks (UNEP, GRI) and through expert judgement assess linkages of telework to the SD themes and domains
- Use those themes and domains as the basis of measurement and evaluation



Example of 15 SD themes and used in Sustainable Telework Project drawn from UNEP/GRI

ECONOMIC	ENVIRONMENTAL	SOCIAL
Added Value	Transport	Social Inclusion
Human Capital	Air Quality	Quality of Life
Employment	Resource Consumption	Work-Life Balance
Personal Wealth	Built Environment	Health
Resilience	Safety	Community



Headline findings: 32 EU case studies; 150 desk top studies (www.sustel.org)

ECONOMIC	ENVIRONMENTAL	SOCIAL
Mainly positive for both employers and employees	Mainly beneficial Reduced travel, energy demand	Improved work life balance, social inclusion and health
Improved Performance, efficiency and productivity	BUT	BUT
Upskilled Workforce	Equipment proliferation	Some forms creates stress and longer hours

Benefits are achieved by ability to save or reschedule time. Bringing the work to the person rather than the person to the work

Time benefits can be significant for work and non-work.



Telework and Sustainable Development- Conclusion

- **ICT enables people to retain and configure communication with ‘work’ which overcomes time and location constraints**
- **Well designed telework schemes support the goals of Sustainable Development**



SMEs and Regional Disparities

- Study of effects of Broadband Connectivity on 500 Small and Medium Sized Enterprises in Cornwall- most remote of English Counties, poor transport infrastructure, access and communications different
- EU funded BroadBand connectivity programme (ACTNow)
- Focus is UK and on the economic/environmental aspects of SD



Findings: SMEs and Broadband :

ECONOMIC	ENVIRONMENTAL
<p>95% report positive business benefits (65% highly positive)</p> <p>90% improved market reach</p> <p>90% reduced costs of travel and comms.</p> <p>75% better customer relations;</p> <p>70% better access to market information</p>	<p>65% reduced in-work travel; more flexible commute patterns as well</p> <p>55% using less paper</p> <p>35% using video conferencing</p> <p>34% reduced office space</p> <p>BUT: 70% leave computers switched on; 35% are purchasing more equipment</p>



SME's and broadband:Conclusions

- Broadband connectivity and access making business more efficient
- ICT enables travel substitution or offset
- Broadband overcomes some regional locational disparities



(3) ICT and 'environmental' service innovation (SMART services)

- Several of our studies examined role of ICT on supply chains for different sectors (e.g on line auctions, home shopping, electronic data interchange)
- Use and deployment of ICT in new or revised products and services (chemical services management, reverse logistics)
- One example as an illustration



Precision Agriculture

- Widely used in US and increasingly in UK/EU
- Using GPS and on board computers/sensors
- Creates growth/yield maps of fields
- Matches inputs fertilizers/pesticides to precisely match requirements



Conclusions

- For a given yield 10-20% less input of resources – consistent with the environmental aspects of sustainability
- More accurate assessment of crops and crops yields



Conclusions

- The spread of ICT has major implications for Sustainable Development
- Has been a relatively neglected area of policy and research
- In our studies ICT enables changes that are broadly supportive of the economic, social and environmental goals of Sustainable Development



Conclusions

- ICT is and can be used in all sectors and all areas of economic, social and environmental activity and decision-making eg transport, health, business, agriculture, governance,
- Operates and can influence at different scales e.g global, national, regional, local
- The nature of many current ICT applications impacts are unpredictable and uncertain – need research
- Many areas of ICT applications that are not supportive of SD – also need research