

Book Review

ICT and Environmental Sustainability, Friend or Foe?

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Bill Tomlinson, *Greening Through IT: Information Technology for Environmental Sustainability*. 2010. Cambridge, MA: The MIT Press, 210 pp., \$18.96 (hardcover), \$10.17 (paperback), ISBN 978-0-262-01393-2.

Robert Rattle, *Computing Our Way to Paradise? The Role of Internet and Communication Technologies in Sustainable Consumption and Globalization*. 2010. Globalization and the environment series. Berkeley, CA: Altamira Press, 246 pp., \$90.00 (hardcover), ISBN 978-0-7591-0948-3.

The relationship between information and communication technologies and environmental sustainability is complex and still little understood. Will ICT help us move toward a more efficient and sustainable society, or will it increase resource consumption and emissions? Recent books by Bill Tomlinson and Robert Rattle present two opposing answers to these questions. Each details the negative environmental impacts of computers, such as energy consumption, resource depletion, and e-waste, and they both put more weight on the second order effects of using ICT. But while Tomlinson focuses mostly on the positive potential of ICTs for sustainability education and behavioral change, Rattle focuses mostly on the negative effects and rebound effects. A rebound effect (sometimes also referred as Jevon's paradox) occurs when the increase in efficiency of how a resource is used increases the total use, instead of decreasing it (Alcott, 2005).

Bill Tomlinson's book *Greening Though IT* is one of the first books on ICT for sustainability published for a broad and nontechnical audience. The book's central discourse is that environmental problems are caused because there is a gap in time, space, and complexity. While environmental problems are broad, big, and slow, we humans have a narrow, fast, and small perception of them. Tomlinson suggests that ICT presents an opportunity to bridge this gap, since it compresses time, space, and complexity. With this opportunity as the central theme, the book explores a variety of potential positive impacts of ICT on the environment, with examples from agriculture, food, energy, manufacturing, transportation, buildings, and IT manufacturing itself. Three areas are developed in depth, connected with some of the author's own projects: education (with focus on the informal acquiring of environmental skills), personal behavioral change, and organization of collective action.

Greening Through IT is thus a good introduction to the emerging field of ICT for environmental sustainability. As a survey, its main weakness may be a relative lack of broad references. Most cited projects and texts come from computer science, human-computer interaction, and other technical fields, and the text misses references to much of the interesting work coming from such fields as sustainability, future studies, or ecological economics (see, for instance, Berkhout & Hertin, 2004; Fuchs, 2006; or Hilty

et al., 2006). Although the examples and the arguments developed in this book are based on a high-income context, the grounds behind them, such as using IT for green education, for collective action, and for spreading ideas, are also relevant in a development perspective.

In *Computing Our Way to Paradise?*, Robert Rattle takes quite the opposite perspective. He argues that the dominant discourse has been based on the assumption of automatic dematerialization and efficiency using ICT, despite scarce, and sometimes negative, evidence. Some of the negative impacts of ICTs are discussed, particularly the direct impacts related to hardware, but also rebound effects. It points out that telecommuting, paperless offices, media consumption, and some of the classic examples of “rebound” effects where the dematerialization expected from applying ICT occurs, have either failed or backfired. A recurring argument in the book, and of major importance in this field, is that the focus on efficiency, usually the keyword when discussing the benefits of ICT for environmental sustainability, is wrong. Rattle argues that efficiency should not be a goal in itself, and that, currently, it just means more growth. Intensity declines, but energy and material use still grow, a classic rebound effect. The author ends the book looking at the positive possibilities of ICT. The focus is in the distributed, decentralized qualities of ICT as a tool for bottom-up change, more based on self-organization. This argument is not so different than Tomlinson’s ideas about collective action or education, but is not as well developed, and it feels like an attempt to balance the mostly negative discourse.

Computing Our Way to Paradise? abuses a bit of demagogic style, with wordings like “ICTs continue to march forward in lockstep with the deliciously attractive pronouncements by technology wizards and media moguls alike” (p. viii) or “perpetually evolving in the savage battle for Internet eyes” (p. 76). This kind of rhetoric makes the book harder to read objectively, and it does not add facts to the discussion. But apart from the form, the message that this book tries to communicate is important: Opportunities offering ICT for sustainability have to be taken with caution; rebound effects may happen, and efficiency does not automatically mean reduction. We need better models for understanding and minimizing the effects and risks of using ICT with a

sustainability agenda. This is also the case in the context of ICT4D, where it is already more present in the appropriate technology discourse.

In ICT4D, “sustainability” is usually more focused in the social and economic aspects of development than in the environmental (Ali & Bailur, 2007), and many times, the term is used just as a synonym of project longevity. There is, however, a growing amount of research focusing more on the environmental aspects of ICT4D: These projects are looking at how to mitigate the negative direct impacts (Gross, 2012), telling about experiences of implementing alternative energy solutions (Applewhite, 2003), or exploring how ICT can be used for climate change mitigation and adaptation in a development context (Ospina & Heeks, 2010).

Neither of the two books reviewed draw specifically on the “ICT4D” frame, but the discussion that these two books bring forward is quite relevant for the ICT4D community. Tomlinson encourages us to take advantage of ICT for learning sustainability, changing behavior, and organizing actions. Rattle reminds us to be cautious about rebound effects, and also of the importance of combining efficiency with sufficiency. Both point out that these technologies have negative impacts, both in their production and during their use, which cannot be dismissed. The implementation of information and communication technologies in development situations is working toward increasing social and economic sustainability for communities and individuals. For a holistic sustainable approach, the direct and indirect impacts of these technologies in the environment should also be taken into account. These can be either negative or positive, and they are still not well understood. Further research of these effects, along with better models and analysis of interventions in a development context, could provide a more complete understanding of the role ICT can play in a sustainable future. ■

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