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Hobbes, M.

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Figuring Rural Development

Concepts and cases of land use, sustainability and
integrative indicators

PROEFSCHRIFT

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Prof. dr. R. Schefold

To the memory of my father

Preface

The journey that ended in this dissertation started in April 2001 when I received a research position at the Institute of Environmental Sciences (CML) in Leiden, for the project 'South-East Asia in Transition' (SEAtans). This was one of the first projects where two departments within CML, Environment & Development and Industrial Ecology, closely worked together. SEAtans was an initiative of the Institute of Social Ecology (IFF), in Vienna, with partners from Italy, Spain, the Netherlands, Laos, Thailand, Vietnam and the Philippines, and funded by the EU. The general objective of the project was to explore the sustainability of the modernization of South-East Asian societies, by studying the flows of materials and energy on the national and the village levels. In the selected villages, the focus was on flows of biomass products (corn, rice, logs, etc.) and the explanation of why farmers chose for these livelihood activities. CML led the local work in Vietnam and in the Philippines, collaborating with researchers from the Center for Natural Resources and Environmental Studies, Hanoi (CRES) and Isabela State University, the Philippines. Aside from traveling for project meetings, I spent about 5 months in the Philippines and about 2 months in Vietnam for organizing and implementing the village-level field research.

In 2004, we were invited to join the project titled 'Technology of water for irrigation and potable use' (TIPOT), funded by the Asia Pro Eco Programme of the EU. The project concerned the development of a low-cost technology for subterranean treatment of groundwater to combat the arsenic pollution of drinking water in the Bengal region. CML's main task was to formulate guidelines for the embedding of the technology in the local communities in West Bengal and society as a whole (the 'delivery system'). It was initiated by Queen's University Belfast, with partners from Germany, Spain, the Netherlands and India. Thanks to this project I had a job and a full-time Indian assistant-researcher who also gathered an ocean of data on social, economic, agricultural and nutritional issues of the TIPOT case study village, specifically for my PhD. When this project ended, the database was by far from complete, and the depth of the idea of what I actually wanted to do with this database was not fathomed yet. I received one extra year (two years half-time) from CML to devote entirely on my PhD. Parallel to the ongoing data gathering process I developed the indicators described in Chapter 5 and 6. The results of the SEAtans project can be found in Chapters 2, 3, and 4.

In scientific terms, the process underlying the thesis can be described as a rise of methods over substance.

Chapter 2 started out as a first attempt to connect the methodological framework of Material Flow Accounting (MFA) to agricultural transition theory and 'Action-in-Context' (AiC) as a research tool. It was to be a real interdisciplinary methodological and substantive undertaking, with MFA representing the natural science side of the story, AiC representing the social part and the combination of those showing a surplus value. The first anonymous reviews were dreadful, criticizing especially the "unworkable" and "ponderous" methodology. As a result, I changed the paper into a relatively traditional social-ethnographic case study with an almost fully substantive focus, only based, almost implicitly, on the MFA and AiC methodological foundations.

Chapter 3 reports on the second try to apply the same frameworks (AiC and MFA), but now "emerged" as the explicit topic of a methodological paper, illustrated with a case study of an indigenous people village in the uplands of Vietnam. This attempt was greatly helped by that it could be presented as a member of the "socially extended" MFA family, by which also publication in the *Journal of Industrial Ecology* came within reach. The substantive story is well represented, but the actual focus is on the methodological elements. The chapter is especially interesting for the MFA world. Socially extended MFA should find its value at levels where MFA has already proven its utility, which is for broad questions at large, e.g. national, scales. Socially extended or not, MFA does not link up broadly, i.e. theoretically, with issues of local-level rural development. With that, it does not form a deep key to figuring rural development. How should I continue? Here is where the next quest came into being, which was the construction of a new form of MFA that does contain links to theory on important rural issues in the developing world.

Chapter 4 is the result. It develops my own 'rural MFA'. Material flows are conceptually linked to phenomena in rural societies, such as to the transition from extensive to intensive and industrial agriculture through indicators of material productivity and material intensity, to globalization through two indicators of market incorporation, and to food security by way of five synthetic indicators expressing present and future food security. The system is certainly quite "ponderous", as my previous anonymous reviewer would have put it. It results in indicators, however, that are not to be found with the same clarity using any other method. The rural MFA framework is applied on three case study villages in Vietnam, Thailand and the Philippines. The indicators give a quantita-

tive comparison between villages in terms of the indicators, displaying their quite different characteristics on a truly comparative scale.

On this newly acquired footing and confidence, Chapter 5 is an example of the environmental methodologist reaching out into the heart of rural development, i.e. development and poverty. It develops 'freely disposable time' (FDT) as a logically coherent indicator of wealth and poverty. FDT is the time that actors have left after satisfaction of their households' basic needs, and with that captures much of what has been called 'freedoms' by Sen and the capacity that people have to invest in the future, e.g. through schooling or investments in sustainable agriculture.

Chapter 6 was primarily meant as the concluding chapter of the volume. It could not be stopped developing, however, and now discusses land use themes, methodology for theory building and an elaboration of the FDT concept of Chapter 5 into an indicator of community development. Chapter 7 now presents the actual conclusions of the dissertation.

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Measuring for the MFA in Tat