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Figuring rural development : concepts and cases of land use, sustainability and integrative indicators

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Citation

Hobbes, M. (2010, March 4). *Figuring rural development : concepts and cases of land use, sustainability and integrative indicators*. LUP Dissertations. Leiden University Press, Leiden. Retrieved from <https://hdl.handle.net/1887/15036>

Version: Not Applicable (or Unknown)

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Note: To cite this publication please use the final published version (if applicable).

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Conclusions

This chapter provides conclusions based on the material presented in the preceding chapters. It is organized in conclusions on land use, on traditional and rural (rMFA) material flow analysis, on the 'freely disposable time' (FDT) and 'community development' indicators, on method and on perspectives for rural development science. The first sets of conclusions start out by mentioning the overall research questions developed in this study's Introduction (Section 1.7).

On land use

The overall research questions in Section 1.7 were:

- Can land use be explained in direct relation with rational choice theory and land use theories based on rational choice?
- Can plausible development pathways and effective policy options be designed by using explanatory theory and methods?

1.

Spatial land use patterns in the studied villages in the Philippine uplands can be explained fully through rational choice theory. People plant the crop that is most profitable on the given location. The predominant location feature in this context is slope. Of the three major crops (rice, corn and banana), rice is most profitable on flat land, corn on medium slopes and banana on steep slopes. The boundaries between the three zones may wax and wane with changing prices of inputs and outputs. New crops with other profit-to-slope characteristics may alter the pattern drastically. In a perfectly concave landscape, slope-dependent profitability results in a small-scale crop zonation dependent on distance from the valley center. This is a full analogue of Von Thünen's original large-scale zonation dependent on distance to market on perfectly flat land. It is Von Thünen in the mountains. (Chapter 2)

2.

In the villages studied in the Philippines and Vietnam, rational choice based explanatory methods (AiC) as well as population and market-based theories of land use change were applied to explain land use. In both countries, the key to the explanation of land use was the limited availability of favored options. The land users focus first on the most profitable option and switch to the next-favored option if the first one is fully used, and so on until they have spent all their motivation or time. For the Philippine villages, land use scenarios were developed based on the dynamics of corn as the most important crop, called “doing nothing”, “sustainable yellow corn” and “sustainable livelihood diversification”. (Chapter 2) The Vietnamese scenario emphasizes the role of commercial forces in unsustainable resource exploitation and the opportunities that the external markets may bring such as sustainable forestry and pig raising. Perhaps of more importance is absence of the government regulation that is necessary to prevent a Malthusian collapse. A sentiment of pity with the poor stands in the way of this regulation. (Chapter 3)

3.

In the studied villages in the Philippine uplands, swidden (slash-and-burn) agriculture was what people did in order to establish banana plantations in the Sierra Madre forest. Seen on a larger scale, therefore, swidden agriculture represents the cutting edge of the expansion of permanent agriculture into the forest and not, as often assumed, a farming system with any intrinsic economic logic. (Chapter 2)

4.

Thünian distance to market determines the spatial expansion of bananas and logging in the studied Philippine villages. Bananas are planted until a short distance from the feeder road is reached, where profits have fallen to zero. Contrary to the case of bananas, the zero-profit distance of logging in the Sierra Madre forest lies far beyond the horizon. This implies that safeguarding the unique biodiversity of the Sierra Madre requires regulation that is forceful enough to counterbalance a strong economic driver. (Chapter 2)

5.

In the uplands of Vietnam, Tat village represents a constrained agroecosystem with a population density that cannot be relieved by out-migration. Like in many other such places in the world, people have developed an intensive, diverse and strongly integrated land use system. In Tat, this system has become unsustainable. People need the cash gener-

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ated by an unsustainable extraction of natural resources to pay for the very inputs of their major food crop. (Chapter 3)

6.

Near the city of Calcutta (India), the village of Kashimpur shows an intensive farming system with high population densities that is sustainable because the urban market is secure and nearby, and offers off-farm opportunities. The difference between the consequences of the high population densities between Tat and Kashimpur can also be traced through Thünian theory. Kashimpur neatly fits into the Thünian logic of intensive agriculture near the city, but Tat is far removed from the intensive zone and its system is in fact an anomaly. (Chapter 6)

7.

Making classifications of types of land use systems or types of villages can help in building descriptive theory, e.g. by enabling cross-regional comparison. One distinction proposed in Chapter 4, for instance, is between space-based, labor-based and capital-based agriculture. It is misleading, however, to attach an assumption of evolutionary development sequence to these types, as if they are 'phases' with some self-driven logic. (Chapter 6)

8.

Rural development and land use science need adequate terminology. Describing the rural areas of the developing world as spaces lived in by farmers tends to limit the research perspective to only one land use type and burden the research with normative connotations. Respectful terms assuming that all land users do land 'management' and that the sum of what they do is a 'strategy' are prone to mislead the researcher. The rural spaces are lived in by rural dwellers that have often very broad (even partly urban) livelihoods and, just like us, often very non-strategic behaviors in daily life. (Chapter 6)

On bulk and rural (rMFA) material flow analysis

The overall research questions on material flows in Section 1.7 were:

- Can MFA be extended so that it may include explanations of relevant material flows?
- Does MFA as applied on the local level indeed fail to link up directly with any of the substantive themes of rural development?
- If so, can MFA be redeveloped into a framework that does link with key themes of rural development and may generate synthetic indicators for concepts of these themes?

9.

Aggregate ('bulk') material flow analysis (MFA) does not connect with causal chains of explanation. Concrete, disaggregated material flows may however be subject of explanation, e.g. through the Action-in-Context framework, creating a 'socially extended MFA'. Socially extended MFA gives access to much stronger policy recommendations than MFA on its own. (Chapter 3)

10.

Aggregate MFA is an inadequate framework to link up with important themes in rural development, which is exemplified by the MFA in Tat (Chapter 3), by a comparison of various MFA case studies (Chapter 4) and by a study on Trinket island that combines aggregate MFA with qualitative discussions and leads to ungrounded conclusions on transition, incorporation and dependency (Chapter 4).

11.

'Rural material flow analysis' (rMFA) is a system of material flow accounting that generates household or village-wide indicators of land use productivity, land use intensity, material incorporation in external markets (globalization) and a series of five indicators of food security that express food sufficiency at present but also under possible future scenarios (e.g. when markets would fail). The rMFA system is flexible in structure and nomenclature so that indicators can easily be added or omitted, depending on the research objectives and research population (e.g. farmers or nomads). (Chapter 4)

12.

Three rural villages (Dy Abra in the Philippines, Tat in Vietnam and Nalang in Laos) have been analyzed through the rMFA framework. All villages turned out to have a mixed economy, with extractive and agricultural flows side by side. The rMFA indicators show that Tat was characterized by high, probably unsustainable, resource exploitation, organic recycling and high land productivity, combined with low agricultural production per capita. The village depended on food imports and options to secure its food procurement in the future seemed exhausted. Dy Abra was highly incorporated in external markets of agricultural inputs (fertilizer) and outputs (yellow corn and timber), while not using any of its own resources for soil fertilization. Its food self-sufficiency was very low, but a transition of its farming system to more organic farming would establish food independence from the market, if needed. Nalang was the reverse of Tat in various ways, combining relatively extensive land use with ample food supply per capita. People earned their cash by extraction of forest products and specializing on a single inten-

sive crop (cucumber). Nalang's overall system shows the lowest level of market incorporation and the most secure food situation. Thus, rMFA supplied critical and quantitative characterizations of the villages with respect to important rural phenomena. (Chapter 4)

13.

Neither aggregate MFA nor rMFA make any connection to environmental problems (e.g. unsustainability or pollution) explicit. Problem-oriented environmental frameworks rather than rMFA may therefore be superior tools in applied work that searches for environmental problems and solutions rather than system insight. Socially extended MFA (Chapter 3) may be seen as a compromise between the two worlds.

On the 'freely disposable time' (FDT) and 'community development' indicators

The overall research questions on livelihood indicators of Section 1.7 were:

- Is it possible to develop a universal (and synthetic) poverty/wealth indicator that integrates cash and time, and therewith more truly represents household capacities to invest in the future?
- Can this indicator actually be applied through a framework that is robust enough to handle complex real-world situations around the world?
- Might this indicator be expanded to include the community level and indicate capacity for sustainable community development?

14.

'Freely disposable time' (FDT) is defined as the time that the productive members of a household have left after fulfilling the basic needs of themselves and the basic needs that accrue to them through the dependent household members. Freely disposable time can be spent on any purpose, e.g. on above-basic care giving or extra leisure, or to work extra hours to acquire above-basic housing, consumer goods or social status, or to invest in the future, e.g. to build terraces on the farm, build more effective institutions, expand the irrigation system or send a child to college. In other words, FDT equals Sen's "freedoms" and represents a household's resilience to adapt to changing circumstances and its capacity to invest in its development. A level of FDT = 0 expresses that people spend all their energies on bare survival (basic needs) and are caught in the poverty trap. FDT = 0 is the absolute poverty line. (Chapter 5)

15.

FDT depends on people's time use as well as their income. The FDT assessment system developed in Chapter 5 is conceptually coherent, universally applicable and able to handle very complex livelihoods. The latter is illustrated by an application on the land users in peri-urban Kashimpur, India. The former is illustrated by also including some European households in the dataset. FDT can be used to characterize any household, rich or poor. Used as a poverty indicator, FDT is substantively superior to any system that uses only time, food or monetary units to assess poverty, such as the "1 \$/day" poverty line or the cost-of-basic-needs (CBN) method. Even the latter method is insensitive, for instance, to the effect of changing *time* burdens of households, e.g. when long hours of firewood procurement are annihilated by a solar heater or when HIV/AIDS patients are added to a household. FDT expresses these impacts immediately.

16.

A framework that calculates FDT has been implemented in a database that integrates 140 tables through 210 queries to generate the FDT of households. Through this database, FDT has been assessed empirically for households in Kashimpur (India) and three European cases (two middle class and one single mother with a minimum wage and three children). Some of the Kashimpur households had a very low income but a relatively high FDT that was used for schooling or to keep the mother at home and provide 'above-basic' household and child care quality. The poorest households in both India and the Netherlands spent 2 to 3 hours per day to satisfy their basic food and other basic daily consumption needs. The poor Dutch household had a lower FDT (2.3 hour per day) than the poor in Kashimpur (about 5.5 hour per day). In other words, the European household had much less freedom to do anything else than work for basic needs. It must be added here, however, that not only the cost but also the quality of basic goods and services is higher in Europe than in India (e.g. basic housing, communication and health care). (Chapter 5)

17.

Contrary to FDT which has been supplied with conceptual perfection, a full assessment system and an empirical test in Chapter 5, the community development indicator of Chapter 6 has only an explorative status. The community development indicators start out from the total FDT available in a community. It then adds factors of the profitability of work opportunities, the degree to which this work is private or collective action, collective social capital, and risk of unsustainability, external effects and quality of life reduction. The indicator expresses a commu-

nity's maximum rate of development. If a motivational factor is added, it expresses a community's actual rate of development as a potentially testable hypothesis. The development indicator can be assessed 'from the outside' but may also prove to be a stimulating analytical vehicle for a joint discovery of a community's development opportunities and choices by outsiders and community together. (Chapter 6)

On method

18.

Malthusian, Thünian, Boserupian and other broad theories of land use change offer broad 'schemes of explanation'. My own land use pattern of prices and slopes dependent crop sequence (Von Thünen in the mountains, Chapter 2) is another of such schemes of explanation. These schemes of explanation can be used, and have been used in this thesis, without any reliance on their truth content. Looking at Tat, for instance, it does not make much sense to reject Thünian theory because Tat deviates from it. Rather, it makes sense to ask *why* Tat deviates from it, i.e. why Tat follows a different logic than the Thünian scheme. Or, if in a Philippine upland village we find bananas on less steep slopes than corn, it does not make much sense to reject the Thünen-in-the-mountains pattern found in Chapter 2. Rather, it makes sense to ask why the deviation from the scheme occurs. Is it non-rational choice, e.g. because the bananas are a sacred grove? Or is it rational choice but with different factors, e.g. the choice of a farmer who wants to escape from the dependencies that come with corn? (Chapters 2, 3 and 6).

19.

Notwithstanding this general, purely methodological applicability of any theory, progress in a discipline is generally equated with the growth of truth content of theory. In this respect, inductive and deductive methods perform quite differently. The prices and slopes dependent explanatory scheme of Chapter 2, for instance, could not have been found, and neither can it be tested elsewhere, by any inductive method, because prices are invariable over the villages. Furthermore, inductive studies have a low cumulative capacity, since they are not connected to a single theme, theory or model as deductive studies are. (Chapters 1 and 6)

20.

In order to grow, a discipline's theories and models need to be tested, which implies that their key concepts need to be made quantifiable, e.g. through indicators. The methodologically superior indicators are synthetic, that is to say that they express a coherent underlying model. All

indicators developed in the present thesis are of that nature. (Chapter 1)
The key concepts of rural development for framework and indicator building are those that are sufficiently perennial to serve as loci for the accumulation of theory, such as development, poverty, globalization, household strategies, land use dynamics and social capital. (Chapter 1)

On perspectives for rural development studies

21.

The 'community development' indicator expresses a concept that stands central in millions of communities in the developing world. Further research into this indicator could therefore be very fertile for both theory and practice. As said in conclusion 17, even when not fully quantifiable yet (if it will ever be), it can be put to work as a series of questions for joint analyses of communities and outsiders, e.g. how much freely disposable time do we have? what do we do with it? what could we do with it? what factors would be key factors here if we would want to work more effectively towards a better future? (Chapter 6)

22.

Actor-based approaches can produce explanatory insights that can link rural to urban and global actors. This is quite valuable for rural development studies in general but also to material flow analysis (MFA). 'Socially extended MFA' should find its value on larger system levels or broader issues where MFA has already proven its relevance, forming a much desired link with the social sciences. (Chapter 3)

23.

With respect to the FDT indicator, one essential next step is to embed the concept and framework in wider welfare and poverty research. How does FDT relate to really felt, multi-dimensional poverty and happiness across the world? Does a level of FDT = 0 indeed express a more real poverty trap than a level of cash income just sufficient for basic cash needs? Can FDT be measured in quick scans? After some basic answers have been found here, FDT can become the pivot in many questions on causes (e.g. what are essential factors to improve FDT?) and effects (e.g. when does FDT improvement lead people to invest, and out of poverty?)

24.

Actor-based approaches can only start out from concrete human activities and are therefore not suited to contextualize indicators as such. Systematic theory building of rural 'Indicators-in-Context' (explaining FDT, explaining food security, explaining incorporation etc.) requires a

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thorough connection with bio-physical, economic, political-ecological, cultural and geographical theories, and is a promising path of research. Examples are to connect FDT with theories on poverty and time use, and to connect the rMFA food indicators with food security theory and methods.



Soaking jute stalks in Kashimpur