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Response to Dudley *et al*. 2008. "Simulating Oil Palm Expansion Requires Credible Approaches that Address Real Issues"

What Are Participatory Scoping Models?

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THE ELEMENTS OF A PARTICIPATORY SCOPING MODEL

At the heart of our disagreement with Dudley et al. (2008) is what constitutes participatory modeling. For us, participatory modeling can be defined by a number of elements, including types of stakeholders engaged, and degree of engagement with those stakeholders. Another element of disagreement probably centers on the continuum from models as predictive tools to model as tools to explore scenarios. Part of the disagreement is tied up in different approaches to "soft" variables.

TYPES OF STAKEHOLDERS ENGAGED

Dudley et al. (2008) raise questions as to exactly what stakeholders were involved in developing the model and how their needs and concerns have been incorporated. Sandker et al. (2007) are very clear that the participatory modeling was conducted with officials from different government agencies. Although in an ideal situation it would be appropriate to work with many other stakeholder groups as well, in Malinau this was not the aim. Earlier work by Edmunds and Wollenberg (2001) and later descriptions of activities in Malinau (Wollenberg et al. 2007) indicate the difficulty of multi-stakeholder platforms, and indeed warn against such platforms in situations in which power inequalities are extreme, as in Malinau. There is the additional problem that simulation models can be extremely complex and are perhaps not most suited for engagement with communities in which even computers are rare (Neil Collier, *personal communication*, for work in aboriginal communities); though the innovative work on combining role plays and models is illustrative, e.g., Lynam et al. (2002). For these reasons, we opted to work with government officials, some of whom were advocating for oil palm and other investments. The model was built with them as well as with experts who gave inputs into the different domains covered by the model. We hoped that by exploring the pros and cons with the officials, better decision making would take place.

DEGREE OF ENGAGEMENT

The meaning of participation can range from almost complete outside control with token involvement of the local people, to a form of collective action in which local people set and implement their own agenda in the absence of outside initiators and facilitators (Carter 1996, Nemarundwe and Richards 2002). The range of steps is: passive participation, cooperation, consultation, collaboration, and collective action. The ideal in many circumstances is collective action. We wanted to go as far as possible to that ideal.

It is apparently quite common to talk of participatory modeling but then to build models so complex that they are black boxes to participants and take so long to produce that the interest of some participants and stakeholders have long waned. For example, van Ittersum et al. (2008) also talk about participatory modeling but in the context of exceptionally detailed models, which can only be built by outside experts. Such models have their place, but we prefer the use of rapidly built models that can be used almost immediately to provoke discussion on topical issues. And we aim for our stakeholders to participate in the model building. In the context of Malinau this included some individuals spending time learning to undertake the modeling. There are pros and cons to such an approach; it does empower stakeholders to use the tool and understand many of

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the domains inside the model, but on the other hand the degree of complexity and sophistication in the model is limited. We see the trade-offs but definitely opt for simpler models with more engaged participants.

Simplification

Dudley et al. (2008) query some of the model assumptions. Many things could be modeled, and some were, but within the confines of simplification and a short paper only a few things could be touched on by Sandker et al. (2007). In this reply, we look at three aspects that Dudley et al. (2008) raise: migration, deforestation, and negative impacts on local people.

Dudley et al. (2008) query the migration assumptions, and raise an interesting question as to whether as land is converted to oil palm, will local people who were formerly dependent on that land for subsistence, be more likely, over time, to find and accept work in plantations or processing factories? The focus of some of the key decision makers has been, and largely continues to be, development at almost any cost. Large-scale plantation development is a real interest. If that goes ahead, there are insufficient people in the district to provide the necessary labor, and, in any case locals are the ones least likely to secure jobs in such development (see also Potter 2004, Boedhihartono et al. 2007). In the model, migration is driven by the new jobs created. In the short term development will mean more immigration. The threshold for migrants to leave if employment drops is set high because we believe a large number of migrants will stay. Lowering the threshold, with migrants leaving already when employment drops below 60%, for example, would make practically no difference in the first 20 yr of the simulation, and after 40 yr the number of migrants will be 60 times the number at the start instead of 80 times, both equally large numbers. One can dispute whether the exact levels of immigration modeled are too high or too low, but the fact is that the installation of large-scale plantations will boost immigration (Benoit et al. 1989). Dudley et al. (2008) make a valid point that the migration consequences expected from money inflows from payments for environmental service (PES) should also be discussed with the decision makers, though the scale of immigration would be much smaller than with large scale plantations.

Another concern raised by Dudley et al. (2008) is that deforestation might be much higher than modeled. We did model a negative feedback in the plantation scenario through an increase in agriculture outside the plantations, leading to an additional 300,000 to 550,000 ha of primary forest loss besides the forest lost for oil palm clearing. We agree that there is a possibility that more forest could be lost than modeled, especially if large-scale fires would occur. However, since the remaining forest is located on steep slopes and harder to access, it is perhaps less likely to be converted.

Dudley et al. (2008) mention concerns of advocacy groups about the negative impacts of oil palm on local people, and query why we did not consider these. In the referee process of earlier drafts of the paper we were asked not to use the results from certain advocacy groups, as there was a disbelief in their veracity. It is clear there is limited data available on the local impacts of oil palm development, but there are now quite a few research projects that will provide this data in years to come (John McCarthy, *personal communication*, Patrice Levang, *personal communication*, Lisa Curran, *personal communication*).

Including soft variables

Dudley et al. (2008) state that we should go beyond simple scenarios and that we should include components such as likelihood of ethnic strife and level of local peoples involvement, as encouraged by writers such as Sterman (1991). One aim of participation is consensus as to what should be in the model. We have often tried to introduce soft system variables into models, and the earliest versions of the Malinau model had such variables, e.g., strength of village level institutions. But during model development they were weeded out. In other, very different, contexts we have also found stakeholders unhappy to include soft variables. In Central Africa when dealing with nongovernment (NGO) officials, they were highly skeptical of including soft variables such as international commitment to biodiversity and degree of good governance in the landscape. They argued that such variables were not measurable, and that they would not believe the model outcomes if they were included in the model. They were not arguing that such variables were not important. They preferred examining the implications of such variables in different scenarios, e.g., model runs under poor

governance/high corruption vs. model runs with good governance. Thus, the soft variables were not dynamic variables but rather distinct scenarios.

MODELS AS TOOLS FOR EXPLORING AND DISCUSSING SCENARIOS

We are not in the business of predictive modeling; given some of the technical points raised by Dudley et al. (2008), we query whether they have moved very far along the continuum of models as predictive tools to modes as tools for exploring and discussing scenarios. We come close to what van den Belt (2004) refers to as a scoping model. In such a model, a group of stakeholders interactively scope out a complex problem. The model serves to increase understanding but does not attempt to make predictions. This is illustrated in our earlier work with van den Belt (2004), in which a forest landscape in southern Zimbabwe was examined for its multiple goods and services, which were the interest of different stakeholders (Campbell et al. 2000). Scenarios that were explored included changing the rules related to landscape use, and what this meant for local livelihoods and for the forest industry.

The Malinau model served its purpose: provoking some useful debate amongst the real decision makers in the area. The technical points raised by Dudley et al. (2008) on time spans and soft variables are largely irrelevant to the intended purpose.

Examining longer time periods

Dudley et al. (2008) call for examining the model over a longer period, given that plantations are involved and given that a so-called simple test of model validity is to run the model for a longer period. We disagree. Our stakeholders were local officials whose time horizon is closer to 3 yr than the 100 yr that Dudley et al. (2008) call for. Even our selected 40 yr time frame is pushing what is relevant to the local stakeholders in terms of the decisions they are making each year. We did not build the model for 100 yr, and if we did we would have had to include extra elements, e.g., limits to agricultural expansion. To illustrate this point, we made the changes requested by Dudley et al. (2008) for land area. However, it made no difference to the model outcomes that we displayed in the paper (see re-posted model http://www.cifor.cgiar.org/conservation/_ref/research/research.2.5.htm).

Soft variables

We return to soft variables. Dudley et al. (2008) would prefer that such variables be imbedded in the model: “Although the authors report that local leaders are concerned about immigration, this concern is .... (not) imbedded in the model.” We assume that Dudley et al. (2008) would prefer that a variable “concern about immigration” be imbedded in the model and changes decision-maker policies that influence immigration. We do not see this as useful for our purpose. We are talking to decision makers and running scenarios using outcome variables that are important to them. It is not useful to try and have a model sector that incorporates their decision-making process in the model. It is more useful to run scenarios that show different immigration levels based on different assumptions, and then the decision makers can use the model results as one element in their real-life decision-making process.

CONCLUSION

The model is merely a case of: if x, y, and z is assumed then this is what will occur. If, through engagement with stakeholders, concerns are raised and decision makers think more deeply about different options for the future, then the purpose of the modeling will have been achieved. Although it would have been ideal to perform a similar exercise with other Malinau stakeholders, especially local communities, this was not part of the original agenda. Participatory modeling, especially the type that deeply involves the stakeholders, is challenging. We note the recent steps taken by the Malinau district down the conservation and carbon pathway, e.g., http://regserver.unfccc.int/seors/file_storage/cwjg41fo28xz50m.pdf) and hope that participatory scoping models have a role to play in examining future scenarios.

Responses to this article can be read online at:
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