

**Archive of the Population-Environment Research Network (PERN)  
Cyberseminar Discussions on Population and Deforestation<sup>1</sup>  
7-18 April 2003**

**Date:** Tue, 1 Apr 2003 16:06:05 -0500 (EST)  
**From:** PERN Lists Manager <pern-m@ciesin.columbia.edu>  
**To:** pernseminars@ciesin.columbia.edu  
**Subject:** [PERNSeminar\_Deforestation] Welcome

Dear Participant,

Welcome to the Population and Deforestation Cyberseminar, to be hosted by the Population Environment Research Network April 7-18 2003 ([www.populationenvironmentresearch.org](http://www.populationenvironmentresearch.org)). There are about 300 participants registered to participate, from all over the world, and from a wide range of scientific disciplines. Together, we constitute a unique group of people to discuss this vital aspect of nature -- forests are essential to climate and water regulation, to bio-diversity, and as livelihood for innumerable people who live in or near them. Most forests are in decline - is population one of the causes? What will deforestation mean for population?

We have selected one of the most important publications from the last year for our discussion paper, "Proximate Causes and Underlying Driving Forces of Tropical Deforestation" by H. Geist and E. Lambin, the outcome of an IHDP/LUCC project. The authors have generously agreed to open the panel with a few remarks. PERN has enlisted a prestigious international panel of experts to contribute statements, which will be posted every other day of the seminar. These contributions will bring diverse views from experts with decades of experience in the arena of deforestation.

However, the discussion will be generated by you, the participants, with your experiences, views, and questions, from all over the world, from your different research experiences, and different levels of expertise. We hope you will all participate, and in particular, we encourage younger researchers, and those who are living in the countries where deforestation is an issue, to contribute.

The purpose of the seminar is to facilitate a thoughtful discussion, disseminate a wide variety of insights and ideas, and to promote a deeper understanding of demographic impacts on forests, in particular threatened forests, among a large group of interested researchers and experts. We will publish a summary of the discussion on PERN.

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<sup>1</sup> See <http://www.populationenvironmentresearch.org/seminars.jsp>.

To ensure that the cyberseminar is successful and that we have a lively intellectual discussion, we would like to ask all the participants to be mindful of a few standards of conduct similar to those you might find in a face-to-face meeting. Please remember:

- \* Respectful disagreement is fine; impoliteness is not accepted.
- \* Opinions are welcome; advocacy is not - this is an intellectual debate, please refrain from using this forum for any advocacy purposes.
- \* Respect other's email space: do not repeat something you have already said and limit yourself to a reasonable number of postings.

With these standards in mind, we look forward to your active participation in the seminar.

We look forward to a successful meeting,

Annababette Wils, PERN Coordinator,  
on behalf of the PERN Steering Committee and Liaisons.

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**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Opening Statement**

Population and deforestation: PERN cyberseminar  
Initial statement by Eric Lambin and Helmut Geist

One of the conclusions of our systematic analysis of 152 case studies of tropical deforestation was that the case study evidence examined suggest that population increase due to high fertility rates is not the primary driver of deforestation at a local scale, over a time period of a few decades. Moreover, demographic factors - as for any other variable examined - were always combined with other factors, in a synergistic manner or with multi-directional links, in driving deforestation. In such a statement, every word has its importance. It is particularly the case for the four qualifications that are part of this statement (in italics above). They each merit further discussion.

1. " population increase due to high fertility rates "

Indeed, population does matter for recent deforestation, but not primarily for its sheer increase due to high fertility rates. The case studies overwhelmingly suggest that, at the local scale and over a few decades, in-migration into forested areas with low population density, ever changing life-cycle features of households over various settler generations, labor availability, and the breakdown of extended families into several nuclear families are more important demographic variables in explaining deforestation than high fertility alone. Late in deforestation processes, once forest frontiers become closed, local demands associated with rising population densities and urbanization become more important. Therefore, a population analysis of great nuances is required. A range of demographic factors are expected to have a different explanatory power at different moments in a deforestation process. What kind of data is minimally required to uncover such complexities?

2. " at a local scale "

In most case studies that involved rapid demographic changes, migration was more often cited as being an important cause of deforestation than high fertility. Many of the population movements in the main forested countries take place within national boundaries. When the spatial scale of analysis is expanded from a few villages to the national level, the origins and destinations of migrants are included in the same spatial unit of analysis and, therefore, internal migrations become invisible. In that case, the mere growth of population at the national level is more likely to become the main explanatory variable of deforestation. Is it the only reason why most cross-national statistical analyses of the causes of deforestation identify human population growth as one of the few significant variables, even though it is counter to local scale case study evidence? Or are there other spatial aggregation effects?

3. " over a time period of a few decades "

Over the broad sweep of human history, population increase is clearly a dominant factor of environmental change. But, when only the last few decades are examined (or even the entire 20th century), other factors such

as economic output, international trade, urbanization, energy use, technological efficiency, etc. have grown much faster than population in many parts of the world. What is the threshold in the length of the time period of study for population growth to be considered a dominant explanatory variable of deforestation?

4. " always combined with other factors "

In the case studies, demographic factors were always explaining deforestation in association with economic, policy & institutional, cultural or technological factors. The environmental impact of population cannot be studied in isolation from these other driving forces.

Furthermore, one could argue that population growth is an endogenous variable, i.e., resulting from changes in consumption, production system and socio-political organization. Did these variables coevolve (i.e., through mutually self-reinforcing interactions) or is one (or several of them) driving the others? Is it possible to resolve this question or is it a " chicken-and-egg " problem?

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**Date: Mon, 7 Apr 2003 01:56:57 -0700 (PDT)**  
**From: brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>**  
**Subject: [PERNSeminar\_Deforestation] Deforestation - a symptom**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

You state: "Furthermore, one could argue that population growth is an endogenous variable, i.e., resulting from changes in consumption, production system and socio-political organization. Did these variables coevolve (i.e., through mutually self-reinforcing interactions) or is one (or several of them) driving the others? Is it possible to resolve this question or is it a " chicken-and-egg " problem?"

I believe it is a "chicken-and-egg" problem given your other statement "Over the broad sweep of human history, population increase is clearly a dominant factor of environmental change."

I invite you to consider the proposition that global deforestation is one of the clearest indications that the human race is in fact in plague phase as argued by Reg Morrison in his book The Spirit in the Gene.

Because of deforestation the human race is annihilating other animal and vegetable species and destroying the mechanism that decarbonizes and oxygenates our atmosphere.

This has to be the clearest indication that we have achieved plague status.

I would like to suggest that it is within the professional expertise of demographers and biologists alike to make a scientific determination as to whether the human race is or is not a plague.

Yours truly,  
Brad Bartholomew  
Scientists for Population Reduction, Inc.  
<http://www.scientists4pr.org>

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**From:** "alhajhamad" <[sahdcg@sudanmail.net](mailto:sahdcg@sudanmail.net)>  
**To:** <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>  
**Subject:** [PERNSeminar\_Deforestation] comment  
**Date:** Mon, 7 Apr 2003 11:32:24 +0300

Dear colleagues,

Thanks for for the very thoughtfull start by Lambin&Geist. May i request A copy of their paper which will give us more insight into the topic. As it is unfair to comment on these few notes for 152 case studies. However ,sudan,being africa in maniture,borders are only observed in international law but not the people .Obviosly the migration( across border) was and still is part of the coupling mechanism.The migration from shelian coutries during the drought cycle was a case in hand the

drought in the abysinian platea also responsible for pushing people to sudanes plain.so here while groth in pop is local the impact is wider and cannot be fathomed except at the regional level.

alhajhamad

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**Date:** Tue, 8 Apr 2003 09:25:10 -0400 (EDT)  
**From:** PERN Lists Manager <[pern-m@ciesin.columbia.edu](mailto:pern-m@ciesin.columbia.edu)>  
**To:** [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)  
**Subject:** [PERNSeminar\_Deforestation] Response to Geist and Lambin's article

Response to Geist and Lambin's article "Proximate causes and underlying driving forces of tropical deforestation."

Jefferson Fox  
Senior Fellow  
East-West Center  
Honolulu, Hawaii

This article by Geist and Lambin represents a long overdue attempt to synthesize the numerous case studies that have been conducted around the world on the causes of tropical deforestation. They set out to prove that deforestation is driven neither by single-factor causation nor due to irreducible complexity. Based on a meta-analysis of 152 case studies they suggest that tropical forest decline is determined by different combinations of various proximate causes (agricultural expansion, wood extraction, and infrastructure extension) and underlying driving forces (demographic, economic, technological, cultural, and policy/institutional factors) in varying geographical and historical contexts. They conclude that some of these combinations are robust geographically (such as the development of market economics and the expansion of permanently cropped land for food), whereas most of them are region specific. They deduce that at the underlying level, public and individual decisions largely respond to changing national- to global-scale economic opportunities and/or policies, as mediated by local-scale institutional factors, and the at the proximate level, regionally distinct modes of agricultural expansion, wood

extraction, and infrastructure extension prevail in causing deforestation. In my opinion, the strongest contribution of their meta-analysis is the rejection of single factor explanations that put most of the blame of deforestation upon shifting cultivators and population growth.

While acknowledging the importance of this article I am left with the feeling that it is ultimately unsatisfying for both methodological and policy reasons. My methodology misgivings are based on personal experience. I recently classified eight case studies that I know quite well into the proximate and underlying driving forces outlined by Geist and Lambin. I found the exercise of assigning causal factors to case studies to be quite subjective because the correlation between underlying driving forces and deforestation had not been proven in a quantitative sense in any of the eight case studies. Rather these studies presented hypotheses about the connection between these variables and deforestation. What Geist and Lambin have documented in their meta-analyses is not known correlations between a host of underlying driving forces and deforestation but hypothesized correlations. In other words, this analysis represents our collective understanding of deforestation but few if any of the correlations between underlying driving forces and deforestation have been quantified.

In terms of policy, I determined that all eight of my studies were driven by policy/institutional and cultural factors, and six out of the eight were driven by all five factors (demographic, economic, technological, cultural, and policy/institutional factors). Geist and Lambin found that deforestation was driven in 59% of their cases by four or five factors. They concluded that the case study based evidence reveals that no universal policy for controlling tropical deforestation can be conceived. Rather a detailed understanding of the complex set of proximate causes and underlying driving forces affecting forest cover changes in a given location is required prior to any policy intervention. I agree with this conclusion but to me it suggests that at least in terms of policy formulation, deforestation is a matter of something that is pretty close to "irreducible complexity."

Given these reservations, however, let me reiterate that this study is a necessary first step towards improving our understanding of the causes of deforestation. The question then is-where do we go from here? I think the next step is to begin to conduct the long-term longitudinal studies necessary for quantifying the relationships between proximate and underlying driving forces and deforestation that Geist and Lambin have conceptualized.

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**From: "Joe Shead" <Joe@sheadprogramming.com>**  
**To: <pernseminars@ciesin.columbia.edu>**  
**Subject: [PERNSeminar\_Deforestation] Request for table of 152 studies**  
**Date: Tue, 8 Apr 2003 11:42:21 -0500**

Eric Lambin and Helmut Geist,

Please send a list of the 152 case studies and the list of 95  
articles. Also, please include, for each case study, how it was  
counted in the summary tables (tables 1, 2, 3, and 4).

The information I am asking for would be expressible in  
something equivalent to this form:

Case Study: (name and/or number)  
Article: \_\_\_\_\_  
Table 1: agro-wood  
Table 2: permanent cultivation, subsistence ag,  
wood extraction-commercial  
Table 3: pop-econ-tech-inst  
Table 4: market growth-commercialization, etc.

Joseph Shead

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**From: Anna Babette Wils <awils@tellus.org>**  
**To: <pernseminars@ciesin.columbia.edu>**  
**Subject: [PERNSeminar\_Deforestation] more materials by Geist and Lambin**  
**Date: Tue, 8 Apr 2003 13:05:50 -0400**



Dear Colleagues,

For those of you, who are interested in more materials from the Geist and Lambin study, I would like to provide a couple of online references:  
For the full, online report LUCC Study Report #4, from July, 2001 please go to <http://www.geo.ucl.ac.be/LUCC/lucc.html>, scroll down the list to July 2001, and click on the icon of the book cover, or for a free copy, send an email to [lucc.ipo@geog.ucl.ac.be](mailto:lucc.ipo@geog.ucl.ac.be).

This website is also where you can access the BioScience article.  
Another, short summary of the project results is available in the CIESIN (PERN host) Thematic Guide on Land-Use and Land-Cover Change, by A. de Sherbinin, in Chapter 3  
[http://sedac.ciesin.columbia.edu:9080/tg/guide\\_frame.jsp?g=47](http://sedac.ciesin.columbia.edu:9080/tg/guide_frame.jsp?g=47), or go to the CIESIN website <http://www.ciesin.columbia.edu> click on Thematic Guides in the lower-right corner and select Land-Use and Land-Cover Change.

One website provides just tables from the book:  
[http://www.indiana.edu/~act/focus1/tlc/americas/G\\_L\\_tables/am\\_GL\\_tables.html](http://www.indiana.edu/~act/focus1/tlc/americas/G_L_tables/am_GL_tables.html).

I hope this is helpful, and I hope you have the opportunity to join the discussion with some of your own insights and questions about causes of deforestation and the role played by demographic variables.

Greetings,  
Babette

Dr. Annababette Wils  
Coordinator, Population Environment Research Network  
Visiting Scholar  
Tellus Institute  
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**Date: Wed, 9 Apr 2003 09:45:59 -0400 (EDT)**  
**From: PERN Lists Manager <pern-m@ciesin.columbia.edu>**  
**To: pernseminars@ciesin.columbia.edu**  
**Subject: [PERNSeminar\_Deforestation] Statement from Jussi Uusivuori**

Statement from Jussi Uusivuori  
Academy Researcher  
Department of Forest Economics  
PO Box 27 FIN-00014 University of Helsinki  
Finland

Based on my own research experience on deforestation issues, I have little doubt that population and income levels do affect deforestation. In the research based on a fairly large subnational and pantropical data set on forest area variation, the subnational and national population levels, as well as income levels, have consistently come out as significant factors behind forest area variation. I am fairly confident that, because of the presence of time dimension in the data and the ability to control for the varying environmental conditions, the results are applicable in explaining deforestation as well.

Future research should focus not so much on whether population has a role in explaining deforestation, but rather on how and to what extent it matters. For example, how does the impact of subnational population density vary between different regions, or how do the climate and weather conditions affect the impact a population has on forests.

It is true that deforestation is inherently a complex phenomenon. And the closer we get to the local or proximate causes, the more complicated it appears. However, this does not mean that in modeling deforestation we should aim at ever more complex systems models to explain the phenomenon. While it is important to find out what the locally important factors and their possible interconnections are, we should also seek for a broader view of the phenomenon. This should preferably be based on simple models, because simple models can in many cases provide more insight than overly complex ones.

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**Subject: [PERNSeminar\_Deforestation] Comment**  
**To: pernseminars@ciesin.columbia.edu**  
**From: re@popact.org**  
**Date: Wed, 9 Apr 2003 15:12:45 -0400**

I wanted to add the following Web-based document to the record on this compelling discussion:

[http://www.populationaction.org/resources/publications/forestfutures/pdf/forest\\_report.pdf](http://www.populationaction.org/resources/publications/forestfutures/pdf/forest_report.pdf)

This is a Population Action International report from 1999 on interactions between population, consumption and forests, and thus obviously a work of advocacy-oriented research. Among the points it makes (and this is relevant to the carefully worded initial statement by Eric Lambin and Helmut Geist) is that population deserves consideration as a long-term causative factor; that fertility and migration have their own interactions; and that consumption, too, is made salient in large part by the size of consuming populations. I find myself agreeing with the comment of Jefferson Fox that the exercise of trying to quantify and put into matrices the relative impacts of population and other factors at different spacial and temporal scales is "quite subjective." This has been my experience in working on population and environment linkages generally. I feel there is a real danger that these sorts of discussions, while interesting and sometimes illuminating, do not bring the world much closer to strategies that could prove productive in slowing environmental destruction. Such strategies are indeed available, and scientific and other expert help is urgently needed in bringing them to the attention of policymakers whose efforts could make a real difference.

In this report, Tom Gardner-Outlaw and I pursued the population-forest linkage through what we feel is an especially useful question for forest-related policy: In general, would the implementation of population policies based on the Programme of Action of the 1994 International Conference on Population and Development, agreed to by almost all the world's nations, be an effective way, especially in concert with other policies, to reduce and eventually halt the loss of forests?

Thank you for this opportunity to explore these issues.

Robert Engelman  
Vice President for Research  
Population Action International  
1300 19th Street, N.W., Second Floor  
Washington, D.C. 20036

202-557-3403  
Fax: 202-728-4177  
<http://www.populationaction.org>

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**Date: Thu, 10 Apr 2003 01:57:26 -0700 (PDT)**  
**From: brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>**  
**Subject: Re: [PERNSeminar\_Deforestation] Comment**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

"I feel there is a real danger that these sorts of discussions, while interesting and sometimes illuminating, do not bring the world much closer to strategies that could prove productive in slowing environmental destruction. Such strategies are indeed available, and scientific and other expert help is urgently needed..."

In point of fact notwithstanding a series of global summits on 'sustainable development', the forces of consumption and exploitation are on the ascendancy.

If the population-environment community want these strategies implemented we are going to have to scrap 'sustainable development' and come up with a new and much more compelling approach.

We have to demonstrate an urgent need to reverse current trends.

Yours truly,  
Brad Bartholomew  
Scientists for Population Reduction, Inc.  
<http://www.scientists4pr.org>

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**From: PERN Lists Manager <[pern-m@ciesin.columbia.edu](mailto:pern-m@ciesin.columbia.edu)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Statement from David M. Kummer**

David M. Kummer: Statement re "Population and Deforestation."

In the case of Southeast Asia and the western Pacific (Philippines, Indonesia, Malaysia, Cambodia, Thailand, Burma, PNG and the Solomons) in the past 40 years, it is obvious that the major cause of deforestation has been commercial logging. To my mind, there is virtually no connection with population growth (however defined). This agrees with Geist & Lambin; however, they only mention corruption in a passing fashion and I would make it central to the discussion. This is especially important for policy--commercial logging has been unstoppable in all countries and if I may re-phrase their last sentence: "...a detailed understanding of the complexity of corruption and the plunder mentality that pervades these countries makes one realize that the process cannot be stopped." Deforestation has most likely increased in many parts of SEA recently and academic discussions re the "causes" of tropical deforestation have had no effect whatsoever on this underlying reality.

Neglected in the discussion is the fact that, at least in large parts of the Central Philippines (Cebu, Siquijor, Bohol), reforestation is now as great a threat to bio-diversity as deforestation. This is so because everyone is reforesting with the same 5 or 6 fast growing, exotic tree species. Tens of thousands of hectares of former grasslands and degraded areas have been converted to some sort of artificial forest, they are increasing in area and there has been virtually no discussion of these new, man-made "forests".

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**From: "Laura Murphy" <murphyll@bellsouth.net>**  
**To: <pernseminars@ciesin.columbia.edu>**  
**Subject: [PERNSeminar\_Deforestation] deforestation, scale and history**  
**Date: Thu, 10 Apr 2003 19:03:02 -0500**

Dear participants,

The work by Geist and Lambin is impressive, and the short opening statement a concise and thought-provoking summary of findings and key questions. I am impressed by the effort involved in reaching their findings, and compiling the tables, flow charts and conclusions is considerable. The disciplinary and geographic range and high quality of research articles is also impressive. Their general observations and many of the details coincide with findings from specific study site that I know best (in Ecuador, and a broader reading of tropical deforestation literature), so I find I am in broad agreement with their statement. I particularly appreciate the comment on the different, more nuanced 'population' variables or forces at work.

Some thoughts and questions:

What is 'deforestation'? While the study differentiates types of tropical forests (dry, humid, etc.), and many different spatial patterns of forest cover, additional dimensions of 'forests' and deforestation suggest additional academic research.

What about secondary forest, and how that is differentiated from primary? How is 'forest loss' measured, and are those measurements adequate (ref. Leach and Fairhead analysis of deforestation in West Africa)?

While this adds further complexity to the phenomena under study, the deeper understanding from different perspectives and over the very long term is important for understanding, and then deriving appropriate 'policies'. False assumptions lead to wrong policies.

Scale: Temporal scale, geographic scale seem to be key differentiating characteristics of factors "causing deforestation". Efforts to simplify the processes at work and decide what to do must build on understanding of what has happened, which Geist and Lambin's work achieves, different scales, by different actors.

Also, historical scale can possibly add more depth to understanding of current phenomena, and possibly overturn ideas of forest cover, change and formation; i.e., research on centuries old land management practices with more contemporary changes (see Denevan on South America; Leach and

Fairhead on W. Africa and I am sure others)

Thank you for your attention.

Laura L. Murphy, PhD  
Clinical Assistant Professor  
Department of International health and Development, School of Public =  
Health & Tropical Medicine  
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**Date:** Fri, 11 Apr 2003 09:35:01 -0400 (EDT)  
**From:** Steve Kurtz <[kurtzs@freenet.carleton.ca](mailto:kurtzs@freenet.carleton.ca)>  
**To:** [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)  
**Subject:** Re: [PERNSeminar\_Deforestation] Statement from David M. Kummer

Thanks are in order to PERN for their continued sponsorship of these seminars. Regarding the various comments which attempt to nullify population as a driver of deforestation, I have two brief points to make.

First is the localisation of analyses. As populations grow in the richer nations, demand for timber, other wood products, and pulp/paper increases *ceteris paribus*. In other words, demand can be remote (growing populations consuming more stuff), yet still be a driver of unsustainable harvesting in remote areas. The location of the population needn't be in the areas harvested.

Second, there certainly are areas (in Africa, for example), where increasing demand for fuelwood by rapidly growing local populations is a driver. Also, areas are burned for agriculture, sometimes for cash crop remote demand, but sometimes for local needs. Attempts to paint population out of the picture are erroneous, since were there no people (or vastly fewer), demand for tree cutting would obviously cease to be a

problem. This does not obviate other factors; but note that population 'advocates' don't attempt to do that!

There is still, unfortunately, often an emotional response to addressing the scale of human activity, which unavoidably entails the numbers of us alive. There are ranges of behaviour, and normative judgements made about them; but aside from control (by whom?) of behaviour, scale seems a desirable feedback loop to address for pro-active change. Voluntary, not coercive, measures can only help matters. Of course, consumption patterns and production methods must also be addressed

Steven B. Kurtz  
Ottawa

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Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist.—Kenneth Boulding

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**Date: Fri, 11 Apr 2003 09:46:15 -0400 (EDT)**  
**From: PERN Lists Manager <[pern-m@ciesin.columbia.edu](mailto:pern-m@ciesin.columbia.edu)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Statement from David Carr**

Although the Geist and Lambdin model provides a helpful heuristic for conceptualizing the broader phenomenon of deforestation, it was not crafted specifically for addressing deforestation caused by frontier agricultural settlement, the process driving the majority of the world's deforestation and the destruction of the world's richest biodiversity. Thus, the full suite of migration pushes and pulls are not given their due, including demographic, political-economic, socio-economic, and ecological factors. In application of a distal-proximate framework to frontier deforestation, the principle proximate cause of deforestation is colonist land use and the principle underlying cause of deforestation is migration.

For this purpose an alteration of the Geist and Lambdin model would highlight migration as not just one of several "underlying" demographic



causes of deforestation, but as the primary underlying cause of small farmer frontier deforestation. Some other modifications might merit consideration. Ecological factors could be modeled as a separate category rather than housed in the tangential "other causes" category (environmental quality and change has been cited recurrently in the literature as forest clearing determinants). Secondly, "infrastructure expansion" could be a distal cause (infrastructure development has a much greater role in tropical in facilitating agricultural colonization than as a proximate cause). Third, a distinction could be made between household factors (e.g., microeconomic and behavioral variables) and larger, structural factors that may be considered (macro) economic or institutional; it is preferable for model categories to remain consistent with scales of data collection and analysis (at the household and community levels).

Most pertinent to this PERN debate, fertility is not given its due in Geist and Lambdin's model. Frontier migrants tend to have higher fertility than their national cohorts and tend to come from rural areas. High rural fertility can contribute to farm fragmentation and pressures on resources that lead to out-migration to the frontier. Once on the frontier, high fertility can contribute to a revisiting of environmental pressures and a second cycle of out-migration. With relatively limited skills other than farming, second generation frontier out-migrants are likely to be disproportionately selected for as migrants to future frontiers. Thus, fertility, though a secondary cause of frontier deforestation relative to migration, is nonetheless surely a key underlying driver of tropical deforestation.

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**From: "Salonius, Peter" <[psaloniu@nrcan.gc.ca](mailto:psaloniu@nrcan.gc.ca)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: RE: [PERNSeminar\_Deforestation] Statement from David M. Kummer**  
**Date: Fri, 11 Apr 2003 10:41:02 -0400**

Steve Kurtz has addressed the growing demand for fuelwood by locally expanding populations. This demand for energy from the forest will begin to expand exponentially, worldwide, as the peak of oil production is reached during the next decade.

The world is NOT running out of oil, however the imminent oil production peak is important for the world's forests as we begin the slow slide from abundant, cheap, convenient liquid hydrocarbon energy AND expanding economies with global markets, toward less abundant, more expensive, much less flexible renewable energy AND a contraction of world markets with more local trading patterns.

The difference between the solar dependent economy of 1800 and the solar dependent economy of the future ----- after the geological 'manna' has been exhausted ----- is that there are now 6 (six) times as many humans to share the finite energy, that can be derived from the sun, than there were in 1800.

The intersection of increasing energy demand -- driven by skyrocketing population numbers coupled with mindless escalation of global trade -- and decreasing energy production will be defining phenomena of the 21st century as peak world oil production is reached within the next decade or so.

A discussion of forest policy alternatives for an energy scarce world is necessary now, in the light of the enormous increase in demand for wood as fuel that must accompany the beginning of the end of the 'petroleum interval'.

We should remember Albert Bartlett's statement that "Modern agriculture is the use of land to covert petroleum into food" in our projections of population changes that must occur as the finite petroleum subsidy begins to diminish.

Populations have been able to expand far beyond the carrying capacity of the lands they occupy during the last 200 years, due to the subsidy that has been available from geological energy. These populations must contract to keep pace with the shrinking energy supplies that will be imposed upon them by nature. However if it is safe to predict that this population contraction will not be voluntary, then we can expect harvesting practices that are unsustainable and the forest devastation that accompanies these practices to precede actual decreases in human numbers.

Peter Saloniis  
Fredericton, New Brunswick  
Canada

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**Date: Fri, 11 Apr 2003 23:04:06 -0400**  
**From: DavidDMK50@aol.com**  
**To: pernseminars@ciesin.columbia.edu**  
**Subject: [PERNSeminar\_Deforestation] PERNSeminar-Deforestation**

Comment of Dave Kummer: This is a response to about 10 comments so far. I agree with the lead authors and the comment of Jeff Fox that policy (if indeed we have any) must be local (national and sub-national). But if that is the case, why are we even bothering with these cross-national comparisons? The discussion re causes of tropical deforestation is so academic that, to my mind, it is of little use for any sort of policy. Those who think that population causes deforestation and what we need are appropriate population policies, are mistaken in the sense that by the time their policies take effect, the forests will be gone. We don't need more models whether they are sophisticated or simple. In the Philippines and, indeed, all countries where the forests have a large commercial value, there is virtually no political will to stop deforestation because the political system is not designed to represent the people as a whole (all participants to the discussion so far seem to assume a responsive, Western style system of democracy-- nothing could be further from the truth; at least, in SEAsia). Yes, there are proximate and distal causes and we always need more data and better models etc. But the fact that after 20 years of work in this area, academics feel that the statement "deforestation is complex and there is no one single cause" is a significant advance just shows, to my mind, how little the academic discussion has to contribute. I honestly do not see the relevance of this discussion to what is happening in SEAsia--and either do the loggers, military men, and corrupt politicians who benefit from deforestation. The environment of plunder is so pervasive and deeply entrenched that maybe it is time that we stopped talking about forest cover in a general sense and started talking about preservation of areas of high biodiversity.

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**Date: Sun, 13 Apr 2003 11:50:13 -0700 (PDT)**  
**From: brad bartholomew <brad\_bartholomew@yahoo.com>**  
**Subject: Re: [PERNSeminar\_Deforestation] PERNSeminar-Deforestation**  
**To: pernseminars@ciesin.columbia.edu**

"The environment of plunder is so pervasive and deeply entrenched that maybe it is time that we stopped talking about forest cover in a general sense and started talking about preservation of areas of high biodiversity."

There is an ancient chinese proverb (and if there isn't there should be) "He who does not know what the problem is, will not be able to solve it."

If the human race is in plague phase from an evolutionary point of view then any attempt to stop the destruction or even slow it down is completely ineffectual.

One can expect an increase in incurable infectious diseases, increase in global terrorism and social problems of all kinds, and an increase in natural catastrophes as the quality of the environment continues to decline.

But as you correctly point out at least the problem of deforestation will resolve itself. When there is no forest left there will be no more deforestation.

Yours truly,  
Brad Bartholomew  
Scientists for Population Reduction, Inc.  
<http://www.scientists4pr.org>

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**Date: Sun, 13 Apr 2003 22:56:36 -0400**  
**From: DavidDMK50@aol.com**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Deforestation**

Dear Sugato, your comment re deforestation in the US in the 19th century is well taken. In fact, it is difficult to come up with examples of any valuable natural resource in the last 200 years that has been incorporated into the global system in an environmentally friendly way--regardless of the system of governance. // Reforestation, as you know, is not a substitute for deforestation although in public discussions that claim is often made implicitly. Hence the importance I attach to preserving at least some of the original forest. Discussions re total forest cover ignore the distinction between natural and artificial forests. Yours, Dave Kummer.

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**Date: Mon, 14 Apr 2003 09:25:57 -0400 (EDT)**  
**From: PERN Lists Manager <[pern-m@ciesin.columbia.edu](mailto:pern-m@ciesin.columbia.edu)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Statement from M.C. de Castro**

Geist and Lambin article shows that a global policy for tropical deforestation control is not valid. Instead, the authors properly state that both the proximate causes and the underlying forces contributing to forest cover change should be understood into detail at a local level, facilitating the choice of interventions for a particular area. I would like to go a little further and suggest that this understanding is the first and crucial step for a carrying capacity analysis, and that this tool should be a mandatory requirement prior to any project that will result in tropical forest damage.

Most of the proximate and underlying causes should be approved/controlled/promoted by the national/local government. A carrying capacity analysis should be the instrument to drive those decisions. It is up to governments to impose this requirement and it is up to the society to demand its fulfillment. Obviously this would not stop illegal operations, such as logging and human settlement, to name a few, since they are not structurally planned. In this case, however, national/local governments should develop monitoring systems based on remote sensing, which would quickly identify areas under illegal disturbance, but also monitor forest changes that are not in accordance with pre-established government decisions. These systems are a key feature in the timing of

the policy interventions (before or after a greater damage took place).

The lack of both carrying capacity studies and remote sensing monitoring systems brings serious difficulties. Just as an example, human settlement projects promoted in the Brazilian Amazon did not make use of any of these tools, and resulted in dramatic forest loss (Mahar, 1989; Moran, 1993; Caufield, 1996; Pedlowski, 1998; Nepstad et al., 2000). As a result, the interventions take place only when a substantial damage has already been done to the forest. Therefore, although there is no global policy that could avoid tropical deforestation, it is my understanding that the adoption of carrying capacity studies and remote sensing monitoring systems should be on the agenda of any country that is concerned with the protection of its tropical forests. However, it is crucial that the carrying capacity analysis incorporate the proximate and underlying causes of deforestation highlighted by Geist and Lambin.

Mahar, Dennis J. 1989. Government policies and deforestation in Brazil's Amazon Region. Washington, D.C.: World Bank.

Moran, Emilio F. 1993. Through Amazonian eyes: the human ecology of Amazonian populations. Iowa City: University of Iowa Press.

Caufield, Catherine. 1996. Masters of illusion: the World Bank and the poverty of nations. New York: Henry Holt.

Pedlowski, Marcos A. 1998. "O papel do Banco Mundial na formulao de polticas territoriais na Amaznia Brasileira. O caso de Rondonia." Cadernos IPPUR XII:157-180.

Nepstad, Daniel, et al. 2000. "Avana Brasil: os custos ambientais para a Amaznia." Belm, PA: Instituto Scio Ambiental - ISA, Instituto de Pesquisa Ambiental da Amaznia - IPAM.

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**From: DavidDMK50@aol.com**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Deforestation**

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**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Statement from M.C. de Castro**

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Nepstad, Daniel, et al. 2000. "Avana Brasil: os custos ambientais para a Amaznia." Belm, PA: Instituto Scio Ambiental - ISA, Instituto de Pesquisa Ambiental da Amaznia - IPAM.

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**From: PERN Lists Manager <pern-m@ciesin.columbia.edu>**  
**To: pernseminars@ciesin.columbia.edu**  
**Subject: [PERNSeminar\_Deforestation] Statement from John Neto**

Short comment prepared for the PERN cyber seminar on Population and Deforestation  
John Sydenstricker-Neto, Cornell University (jms56@cornell.edu)

Background paper:

Geist, H. J. and E. C. Lambin, 2002. "Proximate causes and underlying driving forces of tropical deforestation." *Bioscience* 52(2): 143-150.  
[http://www.geo.ucl.ac.be/LUCC/pdf/02\\_February\\_Article\\_Geist\\_.pdf](http://www.geo.ucl.ac.be/LUCC/pdf/02_February_Article_Geist_.pdf)

In their article, Geist and Lambin conclude that: a) there is no universal link among tropical deforestation, proximate causes, and underlying driving forces and b) empirical evidences provide no support for theories of global deforestation. Therefore, "no universal policy for controlling tropical deforestation can be conceived" (p.150). The authors stress the need for bringing more complexity into research designs and explanations of the processes of tropical deforestation. They contend that in focusing scientific studies at the local and regional levels (rather than the global) and understanding them, we would be better prepared to inform policies.

I agree with Geist and Lambin that a "Theory" on tropical deforestation is not likely to emerge in the near future and if it emerged would not take us very far. A more promising path to understanding deforestation is to develop historically and locally grounded middle-range theories that eventually could be linked into networks of theories. Having said that, the big question is who should generate the knowledge to inform the processes of developing theories and designing policies to promote local action: the scientists?

Studies on the determinants of tropical deforestation are showing that although much progress has and can be made in conducting integrated comparative, multi-level, and inter/transdisciplinary research, the likelihood of a conclusive, deep understanding of reality is still not foreseen. An increasing number of studies on deforestation are moving from placing the stress on we (scientists) to WE (local stakeholders and scientists).

As an example of the latter, I refer to my own field research with small-scale farmers in Brazilian Amazonia, where farmers (the primary land users who are very knowledgeable of land use dynamics at the local level) were engaged in producing land-use maps derived from satellite imagery.

This strategy provided alternative sources of information for data collection and greater confidence for interpreting and understanding classification errors. Incorporating farmers into the research process led to re-framing working hypotheses and possible explanations as well as developing a language that was meaningful to a broader audience. More importantly, the process of "bringing farmers into the map" served as a catalyst to discuss at the community and regional level the determinants of, and alternatives to, land use dynamics in the region (Sydenstricker-Neto et al. 2003).

In short, research findings on tropical deforestation call for being humble about the potentials of our scientific knowledge and models per se to understand and predict deforestation processes. This means that as we produce knowledge and develop historically grounded middle-range theories, we cannot confine these theories to causal principles and unified explanatory models, as is the typical tendency in academia. There is a call for knowledge and theories that are progressive and transformative in nature. Progressive in the sense that they open new paths to develop explanations and move towards critical thinking, which helps local people access information about what is happening in their environment and make informed decisions. Transformative in that they empower local people to fully participate in forums for discussing land use dynamics, including challenges and alternatives conducive to arresting tropical deforestation and developing more effective land use policies and practices. Relying exclusively in our scientific models is not likely to produce progressive and transformative knowledge but there is a window of opportunity to produce it if our studies can be more inclusive.

Reference cited:

Sydenstricker-Neto, J., A.W. Parmenter, and S.D. DeGloria. 2003. "Participatory reference data collection methods for accuracy assessment of land-cover change maps." In Lunetta, R.S. and J.G. Lyon (Editors). Remote Sensing and GIS Accuracy Assessment. CRC Press, Boca Raton: FL (in press).

Personal information:

John Sydenstricker-Neto (jms56@cornell.edu) is an independent consultant in the area of environmental studies. He carries a M.A. in Sociology and is a PhD Candidate in Development Sociology at Cornell University. His dissertation examines the relationships between social organizations and land use/cover change in western Brazilian Amazonia. His broader work embraces academic and applied research and his interests include the emergence of environmental concerns within sociology and population studies, development and social change, and social research methodology integrating different paradigms and diverse instruments.

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**From:** Anna Babette Wils <[awils@tellus.org](mailto:awils@tellus.org)>  
**To:** <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>  
**Subject:** [PERNSeminar\_Deforestation] last days of seminar, Population and  
Deforestation  
**Date:** Wed, 16 Apr 2003 06:39:57 -0400

Dear Participants,

I am sure that you have been reading the daily statement postings from our panel of experts with comments and thoughts regarding the recent BioScience article by H. Geist and E. Lambin with great interest. I would like to remind you that there are only three more days to the seminar, and if you would like to contribute your expertise, your experience, your insights with the rest of the seminar participants, you should make your postings by Friday, April 18. PERN will consolidate all of the contributions into an online summary of the seminar, and we are also discussing an exciting, new option, which is to consolidate all of the discussion into an article for a leading journal.

To post a contribution, use the email [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu).

We look forward to hearing from you!

Sincerely,

Babette Wils  
PERN Coordinator  
[awils@tellus.org](mailto:awils@tellus.org)

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**Date:** Wed, 16 Apr 2003 09:26:24 -0400 (EDT)  
**From:** PERN Lists Manager <pern-m@ciesin.columbia.edu>  
**To:** pernseminars@ciesin.columbia.edu  
**Subject:** [PERNSeminar\_Deforestation] Statement from Alisson Barbieri

Statement from Alisson Barbieri

One important conclusion in the paper by Geist and Lambin is the need to understand the diversity of contexts in the elaboration and implementation of policies. In fact, one of the criticisms about some multilateral institutions is the adoption of similar or quasi-similar receipts of development policies in distinct contexts, such as financing for the opening of roads in Africa or Latin America. Current research at the Carolina Population Center (University of North Carolina at Chapel Hill) has investigated the fact that the process of deforestation in the Ecuadorian Amazon does not occur for the same reason seen elsewhere in most of the Amazon (especially in Brazil), that of landholdings changing hands from relatively intensive land uses such as crops (by small farmers, who initially clear the land) to extensive forms of land use, such as cattle raising (on large farms). Instead, in Ecuador it is directly linked to the rapid growth of population (fertility and in-migration) and associated fragmentation of plots, which reduces the size of many farms so much as to make extensive forms of land use impractical for producing sufficient output to support a family. This example shows the importance of the elaboration of context-directed policies even in similar environments in the Amazon, where causal factors affecting deforestation can present high variability.

An aspect of the literature on causal factors of deforestation that could potentially worth more study is the implications of using a particular definition of scale, time and method of analysis. For example, attempts to determine the effects of policies on deforestation should consider the fact that policies require a time of maturation, and their effects could not be easily captured in cross-sectional studies. The causal factors of deforestation could be defined as scale-dependent, which makes a clear definition of the effects and interactions important when using data at different levels of aggregation. More recently, some researchers have used multilevel conceptual frameworks and models aiming to integrate distinct levels of analysis (being them individuals, households, communities, municipalities) to understand the complex nature of determinants of deforestation and their interactions. In light of these conceptual and methodological developments, data collection instruments are increasingly being used to incorporate a plethora of factors at different levels and over time, making possible a shift from traditional, predominantly aggregate data analysis to analysis that also focuses on the household

characteristics and strategies on land use. Case studies incorporating longitudinal or multilevel analysis (or a combination of both), and methods to link survey data (socioeconomic, demographic and land use information) with land cover information from remote sensing and GIS, have generated new insights on how to look at causal factors of deforestation.

The use of longitudinal and multilevel analytical approaches, and in particular the understanding of household dynamics and its interaction with the context can reveal an important role of demographic factors on deforestation. In this sense, it is important to discuss how methods and concepts are appropriate to measure the effects of demographic factors on deforestation. Most of the population living in rural areas with high deforestation rates in the developing world presents a young age structure, with women at their initial or intermediate reproductive ages probably not achieving their desired family size. Thus, even if contraceptive use continues to rise and a dramatic fertility decline occurs in the next decades, falling to the replacement level or below, the current age distribution with a large proportion of young women will ensure that the number of births continues to be high. Furthermore, and especially in frontier areas in Latin America, a large second and third generations of settlers (descendants of original settlers as well as new in-migrants) put more pressure on the forests. In these cases, it is important to verify the ability of case studies to assess the temporal dimensions of demographic factors affecting deforestation.

Alisson Flavio Barbieri  
PhD Program, Dept. of City and Regional Planning  
Carolina Population Center  
University of North Carolina at Chapel Hill  
barbieri@email.unc.edu

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**From:** "Alex de Sherbinin" <[adesherbinin@ciesin.columbia.edu](mailto:adesherbinin@ciesin.columbia.edu)>  
**To:** <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>  
**Subject:** [PERNSeminar\_Deforestation] some thoughts on the debate thus far  
**Date:** Wed, 16 Apr 2003 12:16:06 -0400

I appreciate David Kummer's response of 4/13 to the Geist-Lambin article and the ensuing postings. Indeed, researchers run the risk of losing the forest for the trees when they attempt to tease out and distinguish among factors that are operating simultaneously in most locations around the world. As Jefferson Fox pointed out, without hard quantitative evidence, it all comes down to subjective assessments concerning which elements are most important in which locations.

Part of Kummer's urgency relates to his experience in SE Asia. To be fair to Geist & Lambin, their longer paper (LUCC Report Series 4, available from the LUCC website) provides a breakdown of proximate causes of deforestation by region. Although they may not have pin-pointed corruption per se, a table of proximate causes on page 24 shows that logging alone or in combination with other factors such as agriculture and infrastructure was present in 67% of the deforestation cases in Asia, but only 38% in Africa and 32% in Latin America. So their analysis can provide a broad indication of which policies to reduce deforestation rates are most likely to work in a given region.

Concerning corruption, which is found not just in SE Asia but in most of the remaining forest frontiers, the only 'policy response' seems to be to uncover it in hopes of reducing its prevalence. I remember visiting Cameroon at the time of a major WWF-sponsored rainforest conference which was attended by heads of states and ministers of environment from throughout Central Africa. As I watched the proceedings on TV with my Cameroonian host, a minister stepped up to the microphone and intoned the benefits of sustainable development and the need to conserve the rainforest. My host informed me that this fellow had pocketed thousands of dollars from foreign logging companies by selling off concessions - many of them right up to the borders of national parks. In Brazil the national environmental protection agency (IBAMA) is under pressure from both sides - from influential constituencies in the developed world who would like to see Amazonian deforestation halted, and from domestic development constituencies and politicians in Amazonia who see any efforts to reduce deforestation as an infringement on the right to develop and have a reasonable standard of living. Illegal cutting of mahogany continues and, despite impressive monitoring efforts, IBAMA lacks the manpower on the ground to stop it.

Global Forest Watch (<http://www.globalforestwatch.org>) provides one model for tracking logging and exposing those who are behind illegal concessions. It is tedious and time-consuming work, but with the aid of satellite imagery they have produced a large number of reports that expose corrupt practices. The other model is Transparency International. Our own analyses of the Environmental Sustainability Index data show that environmental sustainability as measured by the ESI is significantly correlated with civil and political liberties (R-square = .56), lower levels of corruption

(R-square = .53), and democratic institutions (R-square = .51). I just did a quick scatter plot that shows a modest positive relationship (R-square = 0.09, sig at .001 level) between lower levels of corruption (x axis) and forest cover change (y axis) expressed as z-scores (countries in lower left quadrant demonstrate above average levels of deforestation and corruption; countries in the upper right demonstrate below average for both).

Getting back to population - I agree with the sentiments of most of those who have posted thus far. Policies and programs are indeed necessary in order for couples to be able properly plan their families, but I'm unclear that these are the 'answer' to deforestation. Clearly we also need policies that will take effect in the short-term. I happen to believe that local communities will conserve forests if it can be shown to them to be in their best interests to do so, and if they are provided with some support in setting up appropriate institutions. But I also think that preserving some areas under protected status is the only answer in some areas with fast-disappearing forests. The Wildlife Conservation Society & CIESIN recently produced a Last of the Wild map which sought to highlight where the best (or lowest cost) conservation opportunities lie. These are not necessarily the highest biodiversity areas, but those in which the human footprint is most limited (see <http://wcs.org/humanfootprint/>).

I've enjoyed the postings thus far and look forward to the contributions over the next two days.

Cheers,

Alex de Sherbinin

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**Date: Wed, 16 Apr 2003 12:35:51 -0700 (PDT)**

**From: brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>**

**Subject: Re: [PERNSeminar\_Deforestation] some thoughts on the debate thus far**  
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"Concerning corruption, which is found not just in SE Asia but in most of the remaining forest frontiers, the only 'policy response' seems to be to uncover it in hopes of reducing its prevalence."

There is another policy response.

With declining population numbers and adopting an affirmative recycling policy it is possible to achieve prosperity across the board for any country whether developed or developing.

At the point where prosperity across the board is achieved corruption will simply disappear. Corruption thrives in the gap between rich and poor. All you have to do is close the gap.

Yours truly,  
Brad Bartholomew  
Scientists for Population Reduction, Inc.  
<http://www.scientists4pr.org>

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**Date: Wed, 16 Apr 2003 14:27:05 -1000**  
**From: Vinod Mishra <mishra@hawaii.edu>**  
**Subject: [PERNSeminar\_Deforestation] Population and Deforestation**  
**To: pernseminars@ciesin.columbia.edu**

In fact, Lambin and Geist in their opening statement mention that "in most case studies that involved rapid demographic changes, migration was often cited as being an important cause of deforestation."

Vinod



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**Date: Wed, 16 Apr 2003 18:14:49 -1000**  
**From: Vinod Mishra <[mishra@hawaii.edu](mailto:mishra@hawaii.edu)>**  
**Subject: [PERNSeminar\_Deforestation] Comments by Vinod Mishra**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

Dear participants,

I have enjoyed many thoughtful comments on this important, comprehensive piece of work by Geist and Lambin. There seems a general consensus that the relationships between population and deforestation are complex, context specific, and that population is not the only cause of deforestation. However, there remain considerable disagreements on the role and relative significance of population. This is reflected from David Kummer's statement, "to my mind, there is virtually no connection with population growth (however defined)," on one hand, and Jussi Uusivuori's statement, "I have little doubt that population and income levels do affect deforestation," on the other hand. The literature on this subject is similarly varied.

I think part of the problem is that many studies use a rather narrow definition of population, simply in terms of population numbers or high fertility. We need to define population more broadly to also include age and sex structures, family composition, spatial distribution, and migration. Geist and Lambin recognize this when defining demographic factors in their conceptual framework. Similarly, defining deforestation simply in terms of decline in forest cover is obviously not enough.

The other problem has to do with the indirect nature of effects of demographic factors on forests. For instance, one is unlikely to find a correlation between population growth and deforestation in an area if much of the deforestation in the area is due to timber and fuelwood demands of population growth in another area where there are no forests or in a far away city. To me, from such lack of correlation in a local study, it would be inappropriate to conclude that population growth does not matter and that deforestation is driven primarily by market forces.

This relates to Lambin and Geist's point that the relationships between

demographic factors and deforestation are context and scale dependent. The relationships that can be seen at one scale or level of aggregation simply may not be visible at another scale. Internal migration is a good example.

Also, time duration under study matters in whether one finds a relationship or not. For instance, in an area where forests are already severely degraded or depleted beyond a critical level, forest conservation policies may overweigh any negative effects of demographic and economic factors. Whereas, in the same area during an earlier time period, demographic and economic factors may have played important role in causing degradation and depletion of forests.

I agree with Jeff Fox, Alisson Barbieri, and others that we need to move toward carefully designed empirically studies (multi-scale, longitudinal, various contexts) before making firm conclusions about factors causing deforestation.

Vinod Mishra

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**To:** [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)  
**Subject:** [PERNSeminar\_Deforestation] Statement from Alex Pfaff

Statement by Alex Pfaff (Associate Professor of Economics & Int'l Affairs,  
Columbia Univ., New York, USA)

Given the clear and undisputed differences between settings in which deforestation has occurred around the world, it seems hard to disagree with the claim that understanding underlying driving forces for any given case is crucial. Commercial logging incentives in Asia that led to vast clearing of forests without much link to population pressure do not have the same implications for policy as encroachment of labor-constrained agricultural frontiers on forest. I heartily support having a solid clue about what is driving people to clear existing forest, or indeed to plant forest, before proposing policies intended to influence those people's decisions in order to move towards some objective, and more specifically before concluding that the level or growth rate of population is necessarily all that relevant.<sup>1</sup>

While that may rule out a "universal policy", it does not rule out a number of sensible policies depending on setting. Some situations may be inherently very complex, but many have been studied at least qualitatively for some time. For a number of the latter, some relatively straightforward choices would be likely to slow the deforestation rates. Implementing those choices, or convincing those who would have to make them to do so, is often another matter. Other private and social objectives may dissuade the actors in question from acting to slow rates of deforestation. This suggests another value of studying the drivers of relevant decisions--more ability to suggest effective policies.

That said, there are a number of forest situations in which additional understanding of driving processes would help. Believable quantification of causal linkages has been limited, in part by the early focus on global-level regressions, which are often likely to suffer from data limitations (both what variables exist and how well they are measured).<sup>2</sup> In particular, much of the focus on population results from such analyses seems to have been somewhat misplaced, especially to the extent that the few measured variables were interpreted as the only possible causal explanations.

I agree that more closely studying regions and localities can provide better understanding of LUCC driving forces. Here, the finer 'scale' stands in for the ability to feasibly measure many important factors repeatedly with accuracy or, instead, find sources which have done this to some extent in the past and augment that data with current values.

In contrast to that clear issue of 'scale', some of the 'scale-dependence' statements are to me difficult to understand as separate from the question of what decisions matter for forest, who takes them, and what areas do they influence. For instance, if in one setting individual farmers do matter, act to maximize profits, and affect only their own plots, it is

not surprising if they do the same thing because of a dominant, common driver (e.g., global or regional prices). Comparing to settings of dominant and variable local drivers (e.g. soil quality) says nothing interesting about scale. However, aggregation issues certainly exist in the latter case, and these could use some additional clear discussion. For instance, if population matters a lot in one location but not in another, aggregate results could miss both effects.

The 1st and 2nd qualifications in the Lambin/Geist initial statement raise in a particular way this issue of aggregation. While it is interesting to point out that if most migration is internal to a country then nationally total growth matters, that need not be seen as "counter to local case study evidence". If local case studies say that total population matters, that is consistent with national population mattering, even if migration dominates high fertility for local populations.

The statements above are probably rather self-evident. I guess a different question is what could be studied more:

A. "Dynamics" (changing roles of factors, including population, over time): a number of studies have suggested that over a period of decades, household-level strategies involving fertility and investment will evolve. For instance, shifts between capital- and labor-intensive production strategies may occur, affecting the effect of total population. At a more aggregate level, structural change in the economy may well occur over time (in a tropical forest setting, see Kerr, Pfaff and Sanchez 2003, e.g., on Costa Rican district-level deforestation over a span of a few decades). Such changes could imply a shift over time in the impacts of population, e.g., and they would matter for prediction. This concern is consistent with the focus of the last two sentences of the Lambin/Geist statement's 1st qualification.

B. "Compensating Changes & Their Limits": That population can degrade resources was stated in Malthus' views, while Boserup's views added that growth of population, and scarcity, can induce changes in how resources are used. Historically, effects of population on a given resource (or environmental dimension) can be offset by various types of substitution, through technologies that yield more per unit land (or reduce pollution for a given level of output). If such substitution is not taken into account, clearly it could make the effect of population appear to simply vanish.

However, that would not mean population had no effect. Also, it raises questions about how long shifting can last. The 3rd qualification in Lambin/Geist's initial statement raises in a particular way the issue of compensating change. Their comparison might appear to suggest that

population's effect on forest changes depending on the time scale. From a compensation perspective, population's effect may be constant but those compensating changes may not be.

C. "Endogeneity" (population levels react to other factors): in the Lambin/Geist initial statement's 4th qualification, population could both affect decisions that affect forest and be affected by other factors (even clearing decisions). While challenging, in principle such a structure remains amenable to empirical analysis of both causal directions. This should be possible when, e.g., factors not involved in mutually self-reinforcing interactions affect population. In analyzing the effects of factors including population on deforestation in the Brazilian Amazon, e.g., Pfaff 1999 tried to make use of economic shifts in regions (south, northeast) that feed migrants, i.e. population, to the Amazon.

D. "Spatial Distribution Matters": While this may be just an application of attention to setting and data aggregation, when analyzing data involving both rural and urban settings it is worth noting the spatial distribution of population. Pfaff 1999, e.g., finds a significant effect of population, controlling for other factors which affect clearing choices, when allowing that earlier migrants to an empty county can have a different impact on forests than do later arrivals. More specifically the empirical results suggest that the 1st person has significantly more impact than the 1,000,000th. Thus, the impact on forest of a given population depends on how that population is distributed (which may support Schneider 1994's suggestion to build road networks around existing market centers, versus into low-density areas). Consider the case that Manaus has long been a center of activity in Amazonas, an otherwise heavily forested state.

One final example raises at once the issues of forest objectives, spatial distribution of population and compensation. In New England, in the northeast US, when agricultural was dominant a rising population spread out from the coast and cleared forest (though not surprisingly, forest scarcity led to forest-use-reducing innovations in shipmaking e.g., and in stoves). Then the trains linked to the Midwest and cheaper agriculture, New England agriculture decreased, population concentrated in cities, and for a century rising population accompanied regrowth of forest (Pfaff 2000). Being packed into cities reduced land demands for shelter, and inter-regional trade reduced local demands for food, another example of compensating changes which did not refute population's effect but overrode it, at least locally. However, many ecologists have pointed out that the current forest is not 'the same forest' as that which was cleared.

--- Two Hasty Footnotes (probably not worth much for this audience, given

the efforts of Geist & Lambin) ---

1 Within-country analyses include: Panoyotou & Sungsuwan (1989) find that deforestation in Thailand is driven by population density, wood price, income, and distance to Bangkok. Southgate et al. (1991), for Ecuador's Amazon region, first explain population with variables expected to affect "the prospect of capturing agricultural rents", and then explain deforestation with population and other factors. Harrison (1991), for Costa Rica, suggests differing effects of population in different regions and questions whether population is a cause or a "shared symptom". Kummer (1991) is one of few empirical studies to find only a small role for population growth in deforestation.

Cropper, Griffiths and Mani (1999) for Thailand provide evidence both that population matters and that the setting matters for population's effect. Overall for Thailand population density is significant, but more so for the North and Northeast regions than for the South and Central regions (where road density is most important, consistent they say with the commercial nature of agriculture in the region). Chomitz & Gray (1996) stress roads in work on Belize, and further they note that population levels often follow from other underlying factors, such as higher soil quality. Mookherjee et al. (2002) find fuelwood collection rising with population in Nepal (in a low-density rural setting).

2 A number of cross-country analyses correlate factors of interest with national measures of deforestation, including:

Lugo et al. 1981, Allen & Barnes 1985, Palo et al. 1987, Rudel 1989, Cropper & Griffiths 1994, and Deacon 1994.

Among these papers, a number of different empirical results are of interest, such as Cropper & Griffiths' "stage of development" interpretation of the significance of income levels for deforestation, and Deacon's measurement and use of government weakness or instability. The dominant result, though, is that population is the most significant factor in explaining deforestation (although some authors qualify this, in varied ways). This is partially explained by the fact that such cross-country analyses often use few explanatory variables (in the extreme, population alone).

Cropper & Griffiths do include other factors, such as income to allow for the 'environmental Kuznets curve' story, and find that rural population density is significant in Africa, while no population measure is significant in Asia (which could perhaps be explained by the predominance of plantations there, i.e. the particular clearing setting).

Kaimowitz & Angelson (1998) emphasize the importance both of the inclusion of other factors, which can lessen the estimated effect of population, and the understanding of setting (e.g., rural vs. more income and better rights).

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**Date: Thu, 17 Apr 2003 11:25:41 -0400**  
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**Subject: [PERNSeminar\_Deforestation] Human Footprint & Ecological Footprint**

Perhaps of interest to the seminar.



A World Conservation Society webpage is below, with a link to a peer reviewed paper from the journal Bioscience. I have received a comment on it from Mathis Wackernagel (co-author of The Ecological Footprint) which indicates that the term (& meaning of)"Human Footprint" as used here is less informative of human overshoot than Rees & Wackernagel's version (Ecological Footprint). But he agrees that they both indicate massive human appropriation of earth's biosphere and net primary production (Vitousek). David Pimentel of Cornell reckons we glom over 50% at present.

Steve Kurtz  
Ottawa

### The Last of the Wild

The last of the wild represent the largest, least influenced areas (defined as above) in all the biomes of the world in all the world's regions. They represent a practical starting place for long-term conservation, places where the full range of nature may still exist with a minimum of conflict with existing human structures. The Wildlife Conservation Society works to save wild life and wild lands all over the world, while inspiring people to care about and understand nature through the largest system of urban wildlife parks in New York City.

### The Message of the Human Footprint and the Last of the Wild

- \* The human footprint is a global driver of conservation crises on the planet.
- \* If we want to conserve wildlife and wild places and have a rich and beautiful environment for ourselves, we need to find ways to moderate the negative impacts of human influence, while enhancing the positive impacts.
- \* Part of the solution is conserving the Last of the Wild -- those few places, relatively less influenced, by human beings, in all ecosystems around the globe.
- \* Part of the solution is becoming better stewards of Nature across the gradient of human influence through conservation science and action.
- \* But the most important part of the solution is for human beings, as individuals, institutions and governments, to choose to

moderate their influence in return for a healthier relationship with the natural world.

The Wildlife Conservation Society is committed to conserving wildlife and wild places by working on all fronts through its international conservation programs, living institutions, and pioneering environmental education programs.

This work is the result of a collaboration between the Wildlife Conservation Society and the Center for International Earth Science Information Network (CIESIN) at Columbia University, with funding from the Prospect Hill Foundation, the Center for Environmental Research and Conservation (CERC) at Columbia University, and in-kind support from the ESRI Conservation Program.

To find out more, read our recent article in the peer-reviewed journal, *BioScience*.

To read our press release, click here  
<<http://wcs.org/7411/?art=9836050&pg=0>>.

To view and download more detailed maps of the human footprint, go to the Atlas of the Human Footprint  
<<http://wcs.org/home/wild/landscapeecology/humanfootprint/hfatlas/>>.

#### Publications

Sanderson EW, Jaiteh M, Levy MA, Redford KH, Wannebo AV, and Woolmer G. 2002. The Human Footprint and the Last of the Wild  
<[http://wcs.org/media/general/human\\_footprint2.pdf](http://wcs.org/media/general/human_footprint2.pdf)>. *Bioscience* 52 (10).891-904.

Jaiteh M, Levy M, Redford KH, Sanderson EW, Wannebo A, and Woolmer G. 2002. The Human Footprint and the Last of the Wild. In Editor Sappington, N. *ESRI Map Book: Geography and GIS -- Sustaining our World*. Volume 17. ESRI: USA.

#### GIS Data

The Human Footprint and the Last of the Wild are available in GIS data formats from [http://www.ciesin.columbia.edu/wild\\_areas/](http://www.ciesin.columbia.edu/wild_areas/).

The characteristics of the Last of the Wild and the worlds biomes can be downloaded here.

- \* Last of the wild characteristics  
<[http://wcs.org/media/general/ltw\\_characteristics1.xls](http://wcs.org/media/general/ltw_characteristics1.xls)>.
- \* Biome characteristics  
<[http://wcs.org/media/general/biome\\_characteristics2.xls](http://wcs.org/media/general/biome_characteristics2.xls)>.

Note: The human footprint and the last of the wild datasets should not be used for local or regional conservation planning without consultation with local expertise.

[http://wcs.org/media/general/human\\_footprint2.pdf](http://wcs.org/media/general/human_footprint2.pdf)

<http://wcs.org/humanfootprint/>

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<http://populationinstitute.ca>

<http://www.scientists4pr.org/>

Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist. Kenneth Boulding

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**Subject: Re: [PERNSeminar\_Deforestation] Human Footprint & Ecological Footprint**

**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

**From: "Ken Cordell" <[kcordell@fs.fed.us](mailto:kcordell@fs.fed.us)>**

**Date: Thu, 17 Apr 2003 12:38:57 -0400**

Let me add another Footprints publication. It is Footprints on the Land. It is a book published about U. S. population, demographic, recreation, economic, urbanization and other social trends and their spatial relationship to the natural lands of this country. It was done as part of this country's on-going Renewable Resources Planning Act Assessments of forest and rangelands (<http://svinet2.fs.fed.us/pl/rpa/list.htm>) and as background context for the Montreal Process C&I (<http://www.sustainableforests.net/>) report the the U.S.---the 2003

Nation's Report (<http://www2.srs.fs.fed.us/2003/2003.htm>). It examines the spatial patterns of population, economic and recreation demands to forests, water and wetlands, wilderness, and wildlife habitat. Information on availability can be found at <http://www.srs.fs.usda.gov/trends/fpbook.html>.

While I don't often join the seminars, I do read and find the thoughts of participants very useful. With regard to the most recent debate on whether population growth is a driver of deforestation, it without doubt is in my mind in the U. S. That in fact was a conclusion of the recent Southern Forest Resources Assessment, of which I was a player (<http://www.srs.fs.usda.gov/sustain/>).

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**Date: Fri, 17 Apr 2020 14:24:55 -0400**  
**From: Thomas Rudel <[rudel@AESOP.RUTGERS.EDU](mailto:rudel@AESOP.RUTGERS.EDU)>**  
**Subject: [PERNSeminar\_Deforestation] Regional variations in the Pop. - Forests Connection**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

I just want add to add several comments regarding regional variations in the salience of population as a force that drives changes in land cover and land use. In a meta-analysis of local level studies of land cover change that we did for FAO in 1999 (published in *Unasylva* in 2000), population figured prominently as a driver of changes in forest cover in Central America, West Africa, East Africa, and South Asia. It did not appear to be nearly as significant in the Amazon basin and in Central Africa. It also appeared to be of declining significance in Southeast Asia (in comparing studies done in the 1980s with studies done in the 1990s). This interregional pattern of variation throws into relief the importance of the ratio of populations to forest area in thinking about the pop. - forest cover relationship. When the rural populations surrounding or

living in forests have been comparatively large relative to the forested area, analysts were much more likely to cite population as a force driving changes in land cover. Under these circumstances even a small change in migratory flows or in sustenance practices would be sufficient to destroy or degrade the highly fragmented forests in these places. Similarly, declining rural fertility rates, increases in rural - urban migration, and growth in non-farm economic sectors would have to be large to prevent further forest destruction or degradation in a predictable sort of way in these settings. These are all direct effects of rural population change on forest cover/use.

In places like the Amazon, Central Africa, and parts of Southeast Asia which have comparably large forests relative to the surrounding populations, population change would have its primary impact, indirectly, as a force that strengthens urban demand for commodities like beef and oil palm that are produced on converted forest lands.

Regards, Tom Rudel

Dr. Thomas K. Rudel  
Vice Chair Graduate Studies  
Department of Sociology  
732-445-4703 Fax 732-445-0974  
rudel@aesop.rutgers.edu

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**From:** "Alex de Sherbinin" <[adesherbinin@ciesin.columbia.edu](mailto:adesherbinin@ciesin.columbia.edu)>  
**To:** <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>  
**Subject:** [PERNSeminar\_Deforestation] extractive economies & deforestation  
**Date:** Thu, 17 Apr 2003 17:40:45 -0400

On the subject of 'consumption' occurring remotely from extraction, the following presentation by a team of researchers with the EU-funded Amazonia21 project is potentially interesting. By comparing the materials intensity of economies of Amazonia and Europe using methods from the field of industrial metabolism, they conclude (unsurprisingly) that "rich industrial countries externalize materially intensive processes, and

environmental burdens". They find a declining material intensity in the industrial core countries, and an alarming rising materials intensity at the periphery (what they term "extractive economies"). From one graph it appears that Brazil and Venezuela have a very high proportion of biomass materials use when compared to European countries, and the levels are rising over time (not diminishing, as they did historically in most European countries).

Fischer-Kowalski et al., 2001. "Rapid Metabolic Change as a Chance and a Threat to Sustainability: The Case of Amazonia" Paper presented at the 2001 Open Meeting of the Human Dimensions of Global Environmental Change Research Community in Rio de Janeiro. Available at:  
[http://sedac.ciesin.org/openmeeting/downloads/1003419117\\_presentation\\_amazlihdpend.ppt](http://sedac.ciesin.org/openmeeting/downloads/1003419117_presentation_amazlihdpend.ppt)

Cheers,  
Alex de Sherbinin

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**Date: Thu, 17 Apr 2003 21:04:19 -0400**  
**From: Ev & Ken MacKay <[kmackay@uoguelph.ca](mailto:kmackay@uoguelph.ca)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Global Forest Situation**

Dear Friends,

Laura Murphy has asked a set of important questions regarding forests, both so-called old-growth primary forests as well as secondary forests aka commercial plantations. I am particularly interested in her references to history. Much of what has been discussed in this electronic seminar has dwelt on current or recent losses of forest land. But great expanses of land on Earth were covered by forests up until recent times. For me, one of the questions is: what is the correct portion of the surface of the globe that should be left in forest cover? I am concerned to know whether it is possible that we have already converted too much forest land to other uses — or destroyed it completely and left the land as desert.

And some general perceptions on the population-forest relationship:

Forests and forest products are essential basic products used by mankind for fuelwood, for building products, and for paper products — some would say that paper is essential to the operation of our highly “administrated” western society. It should be plainly evident that increasing numbers of people will lead, inexorably, to increasing pressures on forests. The pressure on a particular forest occurs, whether the forest is in North Borneo or in North America, from people in local areas and from people who live half a world away.

Separately, forested land has been pressed into service to produce food ---- the conversion of forests to agricultural land has been going on since mankind began switching from the early hunter-gatherer societies. When Spaceship Earth was lightly populated by humans, that slow conversion caused few disruptions. Now that good farmland is very scarce, farmers are moving onto forested land on steep hillsides in many countries and this leads to at least three serious problems — loss of forests, severe erosion of fragile topsoil, and downstream flooding.

It is acceptable to look at local forest conditions in an effort to discover the near term effects of population. In my view, it is also highly desirable to look at the global picture — because forests, in tropical as well as temperate climates, perform important functions that contribute to the well-being of people all over the globe.

Sincerely, Ken

--

Kenneth MacKay, RR#5, Rockwood, Ont., Canada N0B 2K0  
telephone: 519-822-4174 email: kmackay@uoguelph.ca

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**To:** [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)  
**Date:** Thu, 17 Apr 2003 22:21:03 -0400  
**Subject:** Re: [PERNSeminar\_Deforestation] Human Footprint & Ecological Footprint  
**From:** Bruce E Sundquist <[bsundquist1@juno.com](mailto:bsundquist1@juno.com)>

Those interested in the peripheral issue of human pre-emption of global net primary production may want to take a look at my recent paper (+ Appendix A) titled "Globalization: The Convergence Issue". There I correct an error in the Vitousek et al analysis and correct some inconsistencies with large masses of data and limit the analysis to accessible NPP to compute a human pre-emption of Global accessible NPP of around 90 percent. The paper is on my web site, [www.alltel.net/~bsundquist1/](http://www.alltel.net/~bsundquist1/) The same web site contains my review of the global literature on forest land degradation which is probably more directly related to the purposes of this seminar.

Bruce Sundquist

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**Date: Thu, 17 Apr 2003 23:37:37 -0400**  
**From: DavidDMK50@aol.com**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: Re: [PERNSeminar\_Deforestation] some thoughts on the debate thus far**

From: Dave Kummer  
To: PERNSeminar Members

Speaking once again to the situation in SEAsia, corruption has to be to be at the center of any discussion. Yes, transparency can help but that can only go so far (corruption is still the norm in the Philippines and they have more ngos and reports and conferences and senate investigation etc on th is topic than any country in the history of the world). The statement of one participant that corruption thrives because of the gap between the rich and the poor and that all we have to is "...close the gap" is just plain silly (and irresponsible). Would that life were so simple. And once again, for those who think that population is the issue (however defined), what are the specific, culturally acceptable policy interventions that can be adopted immediately? If there are none, then lets forget about most of the forests and concentrate on the small percentage of forests that are most valuable in terms of biodiversity because, otherwise, they will be gone by the time



researchers can agree on what the driving forces are.

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**Date: Fri, 18 Apr 2003 09:51:57 -0400**  
**From: Steve Kurtz <[kurtzs@freenet.carleton.ca](mailto:kurtzs@freenet.carleton.ca)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: Re: [PERNSeminar\_Deforestation] some thoughts on the debate thus far**

Dave Kummer asks:

> And once again, for those who think that population is the issue (however defined),  
what are the specific, culturally acceptable policy interventions that can be adopted  
immediately?

Which culture? There are various taboos in different societies, and even cases of  
religious and state urged competitive breeding. (documentation available if you doubt  
this) Despite those exceptions, there have been agreed policies and commitments of  
funding from many multinational meetings (ex Cairo) which have been willfully reneged  
upon by the rich nations. (recent short newspaper piece below)

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The People Problem; When will the world face it?  
Editorial from The Star Tribune (Minneapolis, MN)  
April 14, 2003  
<http://www.startribune.com/stories/1519/3820224.html>

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Fifty years from now, most of the world's people could be literate and properly fed, able  
to live truly decent lives. At least that's one scenario for how the future might look. The  
other? It involves a planet with another 2.6 billion people \_ most of them illiterate,  
impoverished and ill. They'll live short and hungry lives, knocking elbows with their  
neighbors as they scratch a living from a square of dirt.

Isn't there a third alternative? Not really. Either the world slows its booming population  
growth or its dreams of conquering global illiteracy and poverty will be dashed. It's true

that the AIDS epidemic is expected to curtail population growth somewhat in the next half-century. But that's the sort of "good news" the world can do without. Mounting evidence suggests that plague is spawning a state of perpetual famine in Africa by killing off the continent's most productive citizens.

Efforts to educate and feed all the world's people will remain a challenge in any case. It can't possibly succeed if new mouths and minds keep appearing faster than they can be filled. The mission can only be accomplished if the need to control population is taken seriously.

Sad to say, there's little sign that the world's nations are serious about population control. They seemed serious back in 1994, when the U.N. population conference was held in Cairo: Back then, they pledged to invest \$17 billion a year in population control and reproductive health by the year 2000. That amount, it was felt, would suffice to dampen population growth to a reasonable level.

But the promise hasn't been kept \_ not at all. As the U.N. Population Fund noted earlier this month, the total spent on population control in 2000 was only \$11.2 billion. In 2001, the figure dropped shamefully, to \$9.4 billion. Numbers for 2002 and 2003, still being calculated, are expected to be at least as dismal. The worst backsliders are industrialized countries, which have come through with just 40 percent of their assigned share.

The failure to follow through on the Cairo goal isn't just unfortunate. Over the long haul, it promises to be disastrous. Because of the cash shortage, birth-control access is being denied to hordes of clamoring couples. Condoms are in perilously short supply in AIDS-stricken countries. Fertility rates remain ominously high in the world's poorest regions. Over the years, the upshot of underspending will be hundreds of millions of unwanted pregnancies, untenably large families, untold numbers of preventable AIDS cases.

This is the wrong course, and an ominously expensive one. Packing the world with too many people is a sure way to make the majority miserable. Even now, a good half of the world's citizens subsist on \$2 a day or less. As U.N. Population Fund director Thoraya Obaid argues, the only way to bring hope to them is to invest in the strategies known to squelch poverty. Chief among them is population control, so foolishly neglected by the world's wealthy.

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Steve Kurtz  
Ottawa

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**Date: Fri, 18 Apr 2003 11:47:41 -0400**

**From: Ronald Rindfuss <ron\_rindfuss@unc.edu>**

**To: Anna Babette Wils <awils@tellus.org>**

**CC: "'pernseminars@ciesin.columbia.edu'" <pernseminars@ciesin.columbia.edu>**

**Subject: Re: [PERNSEminar\_Deforestation] more materials by Geist and Lambin  
Ron Rindfuss**

If a cyberseminar intersects your life at a particularly busy time, it is difficult to participate. That has been the case for me for this seminar. It is only late yesterday and today that I have had a chance to read the postings. The diversity of issues competently discussed in the postings was impressive and reinforces the notion that the task ahead to fully understand the causal linkages between population processes and deforestation will be difficult.

I would like to second the comment made by many that the effort by Lambin and Geist has been extremely valuable. They systematically examined all the high quality, published, case studies that they could find, and then classified the results according to theoretically relevant variables across a number of important domains.

A problem they faced, noted by several postings, is that the authors of the various case studies did not plan their studies along the lines that Lambin and Geist wanted to use them, and hence Lambin and Geist had to be creative in organizing the studies to fit their purposes. Since I am getting in on the discussion late, I'd like to raise the issue of what's next, and pick up on Jefferson Fox's suggestion about longitudinal studies. I agree with Fox, and suggest there might also be some interim steps that could be taken.

As valuable as the Lambin and Geist effort was, it would seem it could have gone more to the heart of their questions if the data for the various case studies had been available for re-analysis so that they could have made headway in making critical variables comparable. Absent that, having copies of the questionnaires and research protocols used would allow for a better assessment of comparability than is possible with the average published article. So here are some suggestions.

1. At a minimum, case study researchers should make their questionnaires and research protocols available to others. This could be on the researcher's own web site or some web site managed by groups

representing the field. There are already some web sites supporting some of this information exchange. By looking at the questionnaires and research protocols, one can make an informed judgement as to whether a variable labeled the same thing, say fertility, by two different studies really is the same thing.

2. To the extent that confidentiality promises permit, data collected in case studies should be made available to the entire research community. By allowing for analysis by the broader research community, claims about processes operating similarly or differently in different places can be systematically examined by various teams of scientists.

3. If confidentiality needs preclude the sharing of certain data, then other arrangements need to be made such that confidentiality is protected AND data is available for appropriate scientific purposes. Within the population community, a number of different examples are available that could serve as models that the land use community could consider. Setting up such infrastructure can be expensive, and major research funders need to be part of the effort.

Ronald Rindfuss

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**Date: Fri, 18 Apr 2003 10:31:23 -0700 (PDT)**  
**From: brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>**  
**Subject: Re: [PERNSeminar\_Deforestation] some thoughts on the debate thus far**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

"Would that life were so simple."

It is just that simple. All it requires is to reverse the current mentality that the more people on this planet the better.

With a population in decline and adopting affirmative policy you can achieve prosperity across the board.

If you just think about what I have said for a minute

instead of immediately adopting the hard line that nothing can be done we might get somewhere.

The fact of the matter is that it is human civilization that is causing deforestation - to try and pin it down to population per se, or commercial activity or corruption or whatever is quite immaterial.

By the time you come up with the reasons why the forests are disappearing, the forests will have disappeared.

Yours truly,  
Brad Bartholomew  
Scientists for Population Reduction, Inc.  
<http://www.scientists4pr.org>

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**Date: Fri, 18 Apr 2003 16:30:02 -0400 (EDT)**  
**From: PERN Lists Manager <[pern-m@ciesin.columbia.edu](mailto:pern-m@ciesin.columbia.edu)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Discussion Extended**

Dear Participants,

The discussion is extended to the end of the day on Wednesday, April 23.

Sincerely,  
Lisa Lukang  
PERN List Manager

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**From:** <Frederick\_Meyerson@brown.edu>  
**To:** perNSEminars@ciesin.columbia.edu  
**Subject:** Re: [PERNSEminar\_Deforestation] Discussion Extended  
**Date:** Sat, 19 Apr 2003 1:29:45 -0400

I am enjoying this wide-ranging discussion, and I congratulate PERN for facilitating it. The Geist and Lambin article is a useful starting place and provides a good synthesis of some (but not all) of the studies in this area. I agree with many of the other comments that the article can only be used to pose questions about causality, rather than answer them. The 152 studies are dissimilar in methodology and define variables and use terminology differently, so that they cannot truly be considered as a dataset that can be merged. While it is interesting and valuable to note how many of the studies featured which variables (as the authors chose to describe and aggregate them), the statistics the authors provide are only useful in that regard.

The relative frequency of "proximate causes" and "underlying driving forces of deforestation" measured by Geist and Lambin is a primarily good reflection of the particular interests or disciplinary leanings of the authors of the 152 studies. The relative frequency does not, as Geist and Lambin infer, demonstrate that economic factors (81%) are more prominent underlying forces of tropical deforestation than demographic factors (61%) or cultural or sociopolitical factors (66%). What it appears to prove is that more economists have studied this issue than demographers or sociologists. For instance, 13 of the 17 single factor causation studies Geist and Lambin included involved economics, 4 involve institutional factors, and none involve demographic, cultural or technological factors. It is unclear why there were no single factor studies included involving those other three factors, but their absence in this survey predetermines its results.

This skewing of past research may perhaps be explained by the greater relative availability of research funds in economics and other disciplines. But to put these numbers (81%, 61%, etc.) in boxes of varying sizes (implying relative importance) in a flow-chart and describe it as a "causative pattern of tropical deforestation" (Figure 2) is somewhat misleading. Therefore, the article can only be considered as a useful jumping-off point.

I also agree with the comments that suggest that chasing proof of causality of tropical forest loss may be akin to rearranging deck chairs on the Titanic. Given the rapid rate of loss in certain areas and short time horizon for action, conservation policy must often necessarily be based on minimal or imperfect information. For instance, one crude measure that I found explained a high percentage of forest cover loss in parts of Central America at many scales was population density (Meyerson, IUSSP 2001). Notably, there was no indication that existing conservation management practices were significantly altering the close relationship between population density and forest loss. While this doesn't answer the causality question, the strong correlation is enough to suggest that

forest managers have to find a way to keep population densities low to have a chance to maintain forest cover.

However, what is true in a particular part of Central America may not be relevant to other parts of the world. So I agree with Geist and Lambin that analysis must focus on forces affecting the particular location. Given the short time horizon for policy intervention, though, it would be wise for managers not to get too caught up in the fascinating tangle of complex models.

Thanks again to PERN for this interesting exercise and exchange.

Reference:

Meyerson, F.A.B., "Human Population Density, Deforestation and Protected Areas Management: A Multi-scale Analysis of Central America, Guatemala, and the Maya Biosphere Reserve", International Union for the Scientific Study of Population, XXIV General Population Conference, Salvador, Brazil, 2001.

Frederick A.B. Meyerson, Ph.D., J.D.

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**Date: Sun, 20 Apr 2003 02:00:18 -0700 (PDT)**

**From: brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>**

**Subject: [PERNSeminar\_Deforestation] The change has to come from PERN**

**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

I know I always end up in these seminars by overstating my case and aggravating people, and there is no reason why this time should be any different.

The fact is that if I can't convince the PERN of the need to push for population reduction I will never be able to convince anyone else.

I would like to suggest that instead of researching

the impact of humans on forests you instead start to research and construct models of the ways forests can be preserved if the human footprint was reduced.

The issue is to come up with humane, equitable and practical ways and means for human numbers to be reduced for the good of all (all species animal and vegetable).

This involves the same knowledge and expertise that you already have, only with a different emphasis.

If the change of emphasis does not come from you it will never come. And that would be a tragedy for the world and all its inhabitants present and future.

Yours truly,  
Brad Bartholomew  
Scientists for Population Reduction, Inc.  
<http://www.scientists4pr.org>

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**From: "Joe Shead" <[Joe@sheadprogramming.com](mailto:Joe@sheadprogramming.com)>**  
**To: <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>**  
**Subject: [PERNSeminar\_Deforestation] Holistic discussion versus causal analysis**  
**Date: Sun, 20 Apr 2003 12:40:45 -0500**

Dear List Members,

I also have enjoyed the well-formed, and well-considered critiques.

In section 4.6 of the larger version of the Geist-Lambin study, LUCC Report Series No. 4, regarding the disciplinary breakdown of the case studies, it occurred to me that some of the studies may have discussed all the perceived components of the system without intending that to mean that all the components were



equally causal, nor even "causal" at all, but rather interactive components. Anthropologists, for instance, may have discussed the systems holistically for the purpose of enlightening readers, including policy-makers, as to the complexities of the system, to increase awareness, not to provide a causal analysis. These studies may have yielded 4- or 5-factor scores in the tally, yet I wonder how they would answer, if you asked the case-study authors the question,

What do you think is the cause of this deforestation?

My guess is, they would not weight the factors equally, for one, and further, some factors they would not call "causes" at all. Which parts of an interactive system are causes, and which effects? Which parts are means? Which parts are intermediate parts of a process, or only pieces of a puzzle?

Another question is:

Which variables can be manipulated in this case, and how, to achieve the desired effects?

This shifts the research agenda from a backward-looking to a forward-looking causality.

I haven't read a single one of the case studies in question, yet, nor any that were excluded, so these thoughts are only suggestive.

Joseph Shead  
At Large

(LUCC Report Series No. 4 is available from  
[www.geo.ucl.ac.be/LUCC/lucc.html](http://www.geo.ucl.ac.be/LUCC/lucc.html))

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**Date: Sat, 19 Apr 2003 19:21:37 -0400**  
**From: DavidDMK50@aol.com**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: Re: [PERNSeminar\_Deforestation] some thoughts on the debate thus far**

What follows is a response to several recent comments that were a response to earlier statements that I had made. I am talking primarily about SEAsia and the Pacific Islands. Rates of deforestation have been so rapid and, in fact, have most likely increased in several countries that academic discussions which do not come up with policies that can be enacted now are of limited use. Hence my emphasis on corruption. Even if population growth in Indonesia were to become negative tomorrow, the forests of Kalimantan would still be gone within 10 years or so. My emphasis on 'culturally acceptable' policies is not as a justification for some practices that I find abhorrant and I apologize to anyone who was offended by that statement; rather, it was more a statement (although poorly expressed) that we need policies that can work now. The policy implications of my arguments are: we have to place corruption at the center of the discussion in SEAsia (ban imports from countries? freeze bank accounts? stop foreign aid? I don't have an easy answer--these are tough issues); put more emphasis on protected areas (more money on livelihood etc); reforestation/regrowth is becoming so widespread that we must start to widen the range of species that are used; overall forest cover hides the fact that ref and def are occurring at the same time and we have to incorporate this into our thinking re this issue; environmental economists are looking at paying uplanders for the environmental services that preservation provides to lowlanders--more time effort and money should be spent in this regard. Obviously population is part of this issue but that statement leads nowhere. If we want to save the forests (or, more importantly, the SEAsians want to save their forests), then things have to be done now and population policy is only a small part of that effort.

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**Date:** Mon, 21 Apr 2003 01:52:19 -0700 (PDT)  
**From:** brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>  
**Subject:** [PERNSeminar\_Deforestation] Please excuse the pun  
**To:** [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)

"If we want to save the forests... population policy is only a small part of that effort."

You can't see the wood for the trees.

\*\*\*\*\*

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**From: "Heinrich B. Dulay" <[rylch\\_heinrich@digitelone.com](mailto:rylch_heinrich@digitelone.com)>**  
**To: <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>**  
**Subject: [PERNSeminar\_Deforestation] About Philippines**  
**Date: Mon, 21 Apr 2003 20:15:43 +0800**

While Dr. Kummer's statement on deforestation in the Philippines is a fact, I would agree with Brad Bartholomew that the issue on population must be addressed, especially in the Philippines for that matter. There is a need to house the 80 million Filipinos, which is the concern of the present administration. There are housing projects everywhere in the country and I suspect that this need for housing demands more trees to be torn down albeit illegally. Most often than not, housing project contractors also operates logging business and even quarrying business. While illegal logging is the more obvious culprit, quarrying is more threatening and must also be investigated. Even the famous Chocolate Hills was not spared of quarrying. Acres and acres of hills and mountains have been bulldozed to give way for subdivisions.

On another note, I would like to take up on Dr. Kummer's statement that "reforestation is now as great a threat to biodiversity as deforestation." I am sorry but I hope Dr. Kummer could explain this further to a neophyte like me in the field. Here in the Philippines, reforestation is really seen as an answer to deforestation. Every student (from prep school to college) is even encouraged to plant at least two trees for every one tree that has been cut down. In Metro Manila, man-made forests abound courtesy of a project sponsored by one of the senators. Every vacant lot and park in the metropolis has been planted with trees and tagged as "Forest Park." I thought there was nothing wrong with it until I read Dr. Kummer's statement.

Yours,  
Heinrich B. Dulay  
Philippine NGO Council on Population, Health and Welfare  
<http://www.pngoc.com>

\*\*\*\*\*

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**From: "Colin Filer" <[cfiler@coombs.anu.edu.au](mailto:cfiler@coombs.anu.edu.au)>**  
**To: <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>**  
**Subject: [PERNSeminar\_Deforestation] LOGIC**  
**Date: Tue, 22 Apr 2003 09:17:04 +1000**

This is a very interesting debate, but it seems to be going nowhere fast. The reason, I think, is that people who go hunting for statistical relationships tend to neglect some fairly obvious points of logic. It is not the sheer number of people in any space who bring about a process of deforestation or forest degradation, but what those people actually do. If people carry on doing what they are doing now, and the number of people grows, then the rate of deforestation will obviously increase. The question, therefore, is whether human behaviour can or will be modified in a forest-friendly fashion at a rate which compensates for the growth of population. The answer to this question will obviously be both scale- and context-dependent. Unfortunately, the rate of behavioural modification is a very difficult thing to measure, especially when we get our crystal balls out and try to speculate about the future. Hence the temptation to measure relationships between numbers of people and numbers of trees and overlook the intervening variables.

Cheers, Colin Filer  
Resource Management in Asia-Pacific Program, RSPAS, ANU, Canberra ACT 0200.  
Phone: (61) 2-6125-3039. Fax: (61) 2-6125-4896. Website:  
<http://rspas.anu.edu.au/rmap/>  
ANU CRICOS Provider Number is 00120C.

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**Date:** Tue, 22 Apr 2003 01:36:06 -0700 (PDT)  
**From:** brad bartholomew <brad\_bartholomew@yahoo.com>  
**Subject:** Re: [PERNSeminar\_Deforestation] LOGIC  
**To:** pernseminars@ciesin.columbia.edu

"The question, therefore, is whether human behaviour can or will be modified in a forest-friendly fashion.."

As a general rule human behavior cannot be modified at all.

The one exception is if a society were to achieve prosperity across the board, it would also become better governed, those in authority would become more accountable under the law, and the citizens more solicitous of their own rights and concerned about law enforcement.

It is for that reason I say corruption would disappear in a society where there is no gap between rich and poor.

As for a policy of moderating human behavior without making fundamental changes to the society - forget it!

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**Date:** 22 Apr 2003 11:33:23 -0000  
**From:** "R.B.Bhagat" <bhagrb1@rediffmail.com>  
**To:** pernseminars@ciesin.columbia.edu  
**Subject:** [PERNSeminar\_Deforestation] Re : LOGIC

I find the discussion is very serious and urge to protect forest is very strong through policy initiatives. The fact is that academic excercises not necessarily enlighten policy makers. The politics of power within the state and between the states for

protecting the interest is the deciding factor. Population is the soft targets for the elites and easy to be subjected to policy net with greater legitimacy. The deforestation is also a non-controversial issue because of its direct link with the populous and poor compared with green house gases. It is better that academic exercises are debated but we must agree that it is no longer value free. Even the selection of the issue and methods of study are no longer independent of values. Science is a pretext, a construction and a force of legitimacy. Are we ready to accept this?

Ram B.Bhagat PhD  
Associate Professor  
International Institute for Population  
Sciences, MUMBAI, INDIA

\*\*\*\*\*  
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**Date:** Tue, 22 Apr 2003 10:32:44 -0400  
**From:** Steve Kurtz <[kurtzs@freenet.carleton.ca](mailto:kurtzs@freenet.carleton.ca)>  
**To:** [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)  
**Subject:** [PERNSeminar\_Deforestation] Earth Day (US view)

Greetings all,

Today is Earth Day; the editorial below reflects the reluctance of most nations to encourage shrinkage of their population. Former Senator Gaylord Nelson, one of the founders of Earth Day (today, April 22), has long understood the multiplier effect.

I agree that there are vast differences in material waste and consumption between the minority living in wealthy nations and the majority of humanity in other countries. Yet the multiplier effect isn't negated by that fact. Most humans would gladly consume more (& unfortunately produce more waste) if they could. Forests are but one victim of this reality.

Steve Kurtz  
Ottawa

=====

[http://www.greenbaypressgazette.com/news/archive/local\\_9904236.shtml](http://www.greenbaypressgazette.com/news/archive/local_9904236.shtml)

Sustainability, population issues linked, Nelson says  
By Brian Tumulty

Press-Gazette Washington bureau

WASHINGTON - The key to creating a sustainable society is population, the founder of Earth Day says.

"If you double the population or quadruple it, then the infrastructure has to double or quadruple," said Gaylord Nelson, the 86-year-old former Wisconsin governor and U.S. senator. "One hundred million more cars would be added to the roads. What does that mean? The public has a right to know where the policies are leading the country."

He's using today's observance of Earth Day to call on Congress and the White House to convene hearings on the relationship between sustainability and projected population growth.

He has said in the past that he thinks the United States should cut its population to the 132 million it was around the start of World War II, but he knows that won't happen. Instead, he points to the low fertility rates of western European countries such as Italy as a way to stabilize population.

Consensus won't be easy

Nelson's views in this area are controversial.

Public hearings on sustainability could become yet another battlefield for birth control and anti-abortion forces, for real estate development groups and environmentalists, and for highway advocates and mass transit supporters.

"Because public policies governing access to contraception, sex education and immigration can have a very real impact on U.S. population size, these policies are legitimate environmental issues that need to be discussed within the context of a national population policy," the National Audubon Society states.

But even those who agree on the need for population control are divided between those who say the United States needs to control immigration versus those who see it as a worldwide issue apart from immigration policies.

Nelson optimistically thinks the forums could be used for consensus building once the long-term issues are identified.

He acknowledged that Congress likely won't jump on the bandwagon because lawmakers have their eyes fixed on the next election and not problems that are decades away.

Earth Day's legacy

But that was the purpose of Earth Day when it started in 1970: to raise public awareness and put pressure on elected leaders.

The first Earth Day led to the creation of the Environmental Protection Agency as a Cabinet-level agency later the same year. Amendments to the Clean Air Act also were enacted that year.

Over the years, Earth Day has become a part of American popular culture and is widely observed by school and community groups.

Rep. Tom Petri, R-Fond du Lac, said he thinks of it as a modern-day replacement for Arbor Day. "It used to be that the schools had an Arbor Day celebration and they'd get out to plant that day," he said.

Earth Day needs to regain its position as a time to discuss current topics, said Rep. Dave Obey, D-Wausau. "Frankly, I think it's needed more than ever," he said. "You have assaults being made on the environment from all quarters."

Tough sell in Washington

Despite the high regard the White House says it has for Nelson's leadership on environmental issues, the Bush administration doesn't think a state of the environment speech is necessary.

"While speeches are one way to communicate, the president is interested in results - results that lead to cleaner air, water and land," said Dana Perino, a spokeswoman for White House Council on Environmental Quality. "In the State of the Union address this year he spoke about his plans for those three."

Bush has proposed a Clear Skies Initiative to cut power plant emissions by 70 percent, a Healthy Forests Initiative to prevent catastrophic wildfires and development of hydrogen-powered vehicles, Perino said.

A spokesman for the Senate Environment and Public Works Committee said Monday the panel's agenda for the rest of the year is already full. It plans to act on Bush's air quality legislation, reauthorization of federal transportation programs and security issues involving chemical and nuclear plants.

"The bottom line is that we have those priorities as well as others," said committee spokesman Mike Catancar. "Once we attend to those priorities we can look at sustainability."



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**Date: Tue, 22 Apr 2003 10:31:40 -0700 (PDT)**

**From: brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>**

**Subject: Re: [PERNSeminar\_Deforestation] Re : LOGIC**

**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

"It is better that academic excercises are debated but  
we must agree that it is no longer value free."

This is an excellent point I think.

In the late 60s Erlich was talking overpopulation when  
there was around 2 billion people. In the 80s Martin  
Luther King was talking overpopulation when there was  
around 4 billion people.

And yet still we have population scientists loath to  
talk overpopulation when there is well in excess of 6  
billion headed towards 7 billion.

When are scientists going to let go of their values  
and become a bit more scientific?

The reality is that the world IS overpopulated and  
this is the cause of deforestation and many other  
related problems.

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**From: "Joe Shead" <[Joe@sheadprogramming.com](mailto:Joe@sheadprogramming.com)>**

**To: <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>**

**Subject: RE: [PERNSeminar\_Deforestation] Re : LOGIC**

**Date: Tue, 22 Apr 2003 14:21:40 -0500**

Martin Luther King?

Martin Luther King was assassinated in 1968. He led the US civil rights movement in the 1960s.

In answer to your other points:

Eric Ross, *The Malthus Factor: Poverty, Politics and Population in Capitalist Development*, 1998, Zed Books

It has dramatically changed my views on the population crisis, and those are views that I have had since childhood in the 1970s, and which shaped life-decisions, such as getting a degree in Anthropology.

Which is not to say that population is not a problem. Personally, I would consider a target of a world population 2 orders of ten less than the current six billion to be reasonable. That is, 60 million homo sapiens for the world. Maybe 200 million. That would be a different world.

Would this reduce deforestation? Temporarily, I bet, but the problem is that people don't simply consume what they need, nor do capitalist-industrial enterprises seek a minimum usage. What do they seek? Maximum usage. That is the logic of the free market, the logic of private enterprise, the logic of imperialist capitalism.

At any given point in time, total world consumption, T, of any given resource, is the product of two variables, per capita rate of consumption, C, and total population, P. That is,

$$T = CP$$

Economists are snickering right about now, but I use this grossly oversimplified model to clarify the fundamental issues. Both factors, C and P are equally responsible for T. Therefore, both must be addressed to solve the problem.

Joseph Shead  
At Large

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**From:** "Al Pinto" <apinto@ciesin.columbia.edu>  
**To:** <pernseminars@ciesin.columbia.edu>  
**Subject:** Re: [PERNSeminar\_Deforestation] Re : LOGIC  
**Date:** Tue, 22 Apr 2003 16:05:46 -0400

The conversation has taken a turn that is piquing my interest. Hope you don't mind me asking a few questions and making a few comments.

> When are scientists going to let go of their values  
> and become a bit more scientific?

It may be that values and changing behavior may be the only means to address the pressures on the environment that a burgeoning population can exude. Can science and the scientific method offer solutions for deforestation, overpopulation and environmental sustainability in an already overpopulated world without addressing the modification of human behavior? How so?

> The reality is that the world IS overpopulated and  
> this is the cause of deforestation and many other  
> related problems.

Simply put, more people living and working on Earth means more natural resources are going to be needed to sustain their lives and activities. Especially if what we have come to value in life remains changed. As long as we use wood for building material and people value living in big homes as a measure of success, deforestation will remain a problem. Not that building a home is the only cause for deforestation but I think you can still get my meaning.

Population projections, depending upon who you talk to, are not encouraging if one hopes to see our numbers decrease. Population growth is here to stay unless something cataclysmic or apocalyptic occurs cutting our numbers down to manageable levels. Barring mass extinction events like a planet killing asteroid or WWIII, what realistic options can be offered to an already overpopulated world to sustain the finite resources of the planet we all share? Are the Earth's resources really finite or only finite if we're not willing to change what we value? What role does the human condition play in deforestation, overpopulation, and sustainability? Is our present socioeconomic infrastructure setup for or against a sustainable planet? How

is success or failure measured exactly in human society and what role do those ideals play in all this? Can these questions be answered using the scientific method?

Modern human lifestyle practices, which include transportation methods, climate controlled homes and office buildings, shopping malls, processed food production, wealth generation, etc. are overly consumptive, unhealthy, creating needless waste and are not in harmony with our bodies or our planet. Yet, you'll find, it is almost completely unrealistic to offer solutions that work in harmony with who we are and with the Earth.

It's OK to talk about banning SUV's as long I can still keep mine. It's OK to block development of that housing complex in the wildlife reserve as long as I can still clear my forest to get a better view. So, we rack our brains to come up with solutions that can satisfy our unhealthy desires and make them healthy and sustainable. It doesn't sound like we are coming up with many answers yet though.

The fact is that our bodies weren't really designed to function well living a 'modern' lifestyle, low on exercise, nutrition and fresh air. Air no longer manufactured by trees that have become victims of deforestation practices. Our planet wasn't designed to be used the way it is being used. Science will be successful if it can convince people of that one fact alone.

Many thanks to Lambin and Geist for offering a paper which is extremely valuable and good fodder for a scientific discussion about deforestation. Thank you for letting us here at PERN use it for yet another successful and eye opening cyberseminar and discussion.

Regards,

Al Pinto, Webmaster  
Population Environment Research Network  
CIESIN Columbia University  
apinto@ciesin.columbia.edu

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**From: "Cristina Santedicola" <[cristina@lognet.com.br](mailto:cristina@lognet.com.br)>**  
**To: <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>**

**Subject: [PERNSeminar\_Deforestation] Views from the field**  
**Date: Tue, 22 Apr 2003 20:19:05 -0300**

I would like to congratulate Al Pinto for his comments. Our human race has been doing a quite efficient job transforming this planet into an abiotic environment, especially during the last decades. Many forms of life will not survive if we fail in our attempt to rescue the forests gone and save the ones we still have.

Good luck to all of us!

Cristina Santedicola, Biologist, Brazil  
cristina@lognet.com.br

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**Date: Tue, 22 Apr 2003 16:51:00 -1000**  
**From: Vinod Mishra <[mishra@hawaii.edu](mailto:mishra@hawaii.edu)>**  
**Subject: Re: [PERNSeminar\_Deforestation] more materials by Geist and Lambin**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

Dear all,

In this increasingly ideological debate, I would like to reiterate the importance of some of the concrete suggestions made by Ron Rindfuss to allow better comparisons of existing empirical studies. PERN can possibly help in this process by creating an archive of any questionnaires, research protocols, and data made available. We need to think creatively to somehow make the process rewarding for researchers who share their material (especially data).

Vinod Mishra

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**Date:** Wed, 23 Apr 2003 02:03:13 -0700 (PDT)  
**From:** brad bartholomew <brad\_bartholomew@yahoo.com>  
**Subject:** Re: [PERNSeminar\_Deforestation] Re : LOGIC  
**To:** pernseminars@ciesin.columbia.edu

"Is our present socioeconomic infrastructure setup for or against a sustainable planet? How is success or failure measured exactly in human society and what role do those ideals play in all this? Can these questions be answered using the scientific method?"

My point is that in every other field of scientific endeavor scientists adopt the scientific method.

When it comes to the most serious problem facing the human race, namely overpopulation, scientists head for cover and talk "sustainable development".

Problems such as deforestation can simply not be solved by scientists under these circumstances.

So in answer to your question, yes, these questions can be answered using the scientific method, if only scientists would start using it.

I can tell you right now if there was a scientist in the sky whose job it was to oversee the human race he/she would have put in place a ubiquitous network of family planning/birth control clinics.

The RERN can and should be playing the role of that scientist in the sky.

(I don't know how I got it wrong about Martin Luther King. I definitely read a quote of his decrying overpopulation in the strongest possible terms. I am on an extended trip overseas and don't have access to my data.)

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**Date: Wed, 23 Apr 2003 08:55:29 -0400**

**From: Steve Kurtz <[kurtzs@freenet.carleton.ca](mailto:kurtzs@freenet.carleton.ca)>**

**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

**Subject: [PERNSeminar\_Deforestation] M.L. King  
Brad & all,**

Kung was onboard; you just got the decade wrong (said '80s).

Steve Kurtz

=====

"Family planning, to relate population to world resources, is possible, practical and necessary. Unlike plagues of the dark ages or contemporary diseases we do not yet understand, the modern plague of overpopulation is soluble by means we have discovered and with resources we possess. What is lacking is not sufficient knowledge of the solution, but universal consciousness of the gravity of the problem and education of the billions who are its victims." Martin Luther King Jr.

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**Date: Wed, 23 Apr 2003 10:14:44 -0400**

**From: Ev & Ken MacKay <[kmackay@uoguelph.ca](mailto:kmackay@uoguelph.ca)>**

**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

**Subject: Re: [PERNSeminar\_Deforestation] M.L. King**

Steve and Brad and All,

I would like to underline the quote from Martin Luther King Jr. While I recognize the need to conduct research on the problems and causes of deforestation in particular regions and areas, I am frustrated by the widespread refusal to look at the global relationship(s) between population and environmental degradation. For example, earlier in this seminar, someone commented on the disastrous effects of commercial logging in tropical forests --- and asserted that such logging was not

related to population.

Commercial logging in fragile eco-systems is to be discouraged and, if possible, controlled by legislation. However, I would point out that the loggers and the companies are not harvesting timber "just for the fun of it"!!! There are, somewhere in the world, consumers who are willing to purchase the timber or the by-products of that timber. Thus, I would argue that all such over-harvesting is related to the numbers of humans who want/need the timber or paper or fuelwood.

Such over-harvesting is occurring in many eco-systems --- eg., ocean fisheries off the east coast of North America have been nearly destroyed and this scenario is being repeated in most of the major ocean fisheries. The same type of situation is occurring in many forests. Of course, the over-harvesting in both oceans and forests is greatly exacerbated by the evolution over the past 4 or 5 decades of equipment that greatly multiplies the "efficiency" of the industries.

My grandfather grew up in Nova Scotia in the late 1800s ---- at a time when trees were being "removed" to convert the land to agriculture. When I became interested in conservation in the mid-1900s, I remember him saying, "they'll never cut down all the trees!!". But he grew up with manpower using axes and cross-cut saws. Despite the fact that he lived to 100 years, he had no experience with chain saws ---- and would be incredulous at the kind of power equipment now used in the clear-cutting operations. In this instance, "technology" has multiplied the environmental effect of a single operator by orders of magnitude.

So .... I contend that there is a strong relationship between people and deforestation and that Martin Luther King has pointed out the obvious solution. Please re-read his statement below.

Sincerely, Ken

--

Kenneth and Evelyn MacKay, RR#5, Rockwood, Ont., Canada NOB 2K0  
telephone: 519-822-4174 email: kmackay@uoguelph.ca

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**From:** "Al Pinto" <[apinto@ciesin.columbia.edu](mailto:apinto@ciesin.columbia.edu)>  
**To:** <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>  
**Subject:** Re: [PERNSeminar\_Deforestation] Re : LOGIC  
**Date:** Wed, 23 Apr 2003 11:10:50 -0400



Thank you for your response Brad.

About Martin Luther King, the only thing you had incorrect was the decade, but your point was well taken. Thanks also to Steve Kurtz for digging up the exact quote. Martin Luther King made good points there.

" When it comes to the most serious problem facing the human race, namely overpopulation, scientists head for cover and talk "sustainable development". "

I'm not sure that I follow. Do you feel solutions leading to sustainable development can not be derived by using the scientific method? When is talking sustainable development not scientific in your opinion? What 'bothers' you about that term?

The questions I raised can be addressed using the scientific method but the action items that will inevitably come out of that process, like the need for family planning/birth control, finding alternative methods of fuel and propulsion, getting along with less, etc, involve changes in human behavior and attitudes. If we educate people and give them the knowledge that their current interactions in our environment are not sustainable, will it be enough for them to decide to change their lifestyle and behavior? It may also depend upon the socioeconomic and political climate that exists at the time of their 'awakening'. If living in huge homes, having large families, driving huge gas guzzler cars, and taking as much as you can are still considered measures of 'success', we will be fighting an uphill battle. These aren't insurmountable but they are formidable obstacles. I think that is why scientists seem to be running for cover talking sustainable development. It involves much more than just doing the science. It is also extremely dependant upon politics.

Having said that, I do believe that the PERN can make a huge contribution toward positive change. The science is something we need to do right now. And yes, we need to adopt the scientific method to do that. Convincing others to change will depend upon how well we do our work regardless.

"The PERN can and should be playing the role of that scientist in the sky."

I want to say that we're committed to making PERN useful, helpful and valuable as a resource to scientists and others interested in researching, sharing and connecting with each other in this important field. I'm not sure what it means to be a scientist in the sky but, if there is anything that you, or any other members, feel we can do better, please don't hesitate to provide us with your input. Your feedback is extremely valuable and vital to the success of PERN's mission.

Warm regards,

Al Pinto

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**From: "Al Pinto" <[apinto@ciesin.columbia.edu](mailto:apinto@ciesin.columbia.edu)>**  
**To: <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>**  
**Subject: Re: [PERNSeminar\_Deforestation] more materials by Geist and Lambin**  
**Date: Wed, 23 Apr 2003 11:31:07 -0400**

"In this increasingly ideological debate, I would like to reiterate the importance of some of the concrete suggestions made by Ron Rindfuss to allow better comparisons of existing empirical studies."

Yes. So sorry for sidetracking. Couldn't help myself.

"PERN can possibly help in this process by creating an archive of any questionnaires, research protocols, and data made available. We need to think creatively to somehow make the process rewarding for researchers who share their material (especially data). "

Agreed. Is there something specific we should be doing with the PERN website that we aren't doing now? The PERN bibliographic database can take care of some of those needs right now. Is it useful for those purposes?

Al Pinto

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**From: PERN Lists Manager <[pern-m@ciesin.columbia.edu](mailto:pern-m@ciesin.columbia.edu)>**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**  
**Subject: [PERNSeminar\_Deforestation] Seminar Closing**

Dear Participants,

Reminder: The cyberseminar on Population and Deforestation will be closed by the end of the business day, today, Wednesday, 23 April 2003.

Thank you.

Lisa Lukang  
PERN List Manager

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**From: "Bill McConnell" <[wjmconn@indiana.edu](mailto:wjmconn@indiana.edu)>**  
**To: <[pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)>**  
**Subject: [PERNSeminar\_Deforestation] Harmonization in Land Change Science**  
**Date: Wed, 23 Apr 2003 11:09:31 -0500**

The Geist and Lambin study is part of a larger effort to understand the causes and consequences of land use and cover change globally, under the LUCC Project (<http://www.geo.ucl.ac.be/LUCC/lucc.html>). In undertaking such comparative studies, we recognize the importance of understanding how different variables including, but not limited to, demographic factors are "operationalized" in empirical research. Some progress has been achieved on two fronts which I would like to bring to the attention of seminar participants:

1. Concerning socio-economic data, a number of questionnaire survey instruments used in land change research have been made available on the East-West Center's web site:

<http://www2.eastwestcenter.org/environment/lucclink/papers.htm>.

Researchers should be encouraged to follow this lead, and make their instruments available as well - these needn't be centrally-located; links to project web sites can be just as effective. There are various LUCC websites that link to the East-West Center's site, and further links from PERN/CIESIN can only help.

2. Concerning the dependent variable (forest cover change, in this

case), the FAO has developed a land cover classification system that enables detailed comparison of land cover information in different studies by recording the biophysical parameters used in deciding how to classify a particular part of the earth's surface (be it a map unit, a satellite image pixel, or a field plot). This means we need no longer stuck with trying to compare dissonant map legends - rather, we can use the diagnostic criteria to judge the compatibility of, for example, two forests. Information can be found at: <http://www.lccs-info.org/>. Most of the major land cover mapping efforts have adopted this standard, and case studies are encouraged to do so as well.

These are important advances in the comparative analysis of land use and cover change, but do not address one of the biggest limitations to the use of previously-published case studies, incomplete data. In our ongoing meta-analysis of agricultural intensification, we have been stymied by the absence of key variables in most studies. The population folks will be aghast that in about a hundred cases reviewed so far, more than a dozen failed to provide sufficient demographic information for us to code. Even worse, almost half provided no information on precipitation, often cited as a crucial factors in other studies.

In response to those who argue for a focus on corruption, we are finding government and NGO policies and programs frequently cited as important factors in shaping intensification. It is a real challenge to synthesize this information, and we welcome a dialogue on this topic, and on the broader question of designing longitudinal studies in order to facilitate robust, meaningful comparison across sites.

Bill McConnell

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**Date: Wed, 23 Apr 2003 10:05:46 -0700 (PDT)**  
**From: brad bartholomew <[brad\\_bartholomew@yahoo.com](mailto:brad_bartholomew@yahoo.com)>**  
**Subject: Re: [PERNSeminar\_Deforestation] Re : LOGIC**  
**To: [pernseminars@ciesin.columbia.edu](mailto:pernseminars@ciesin.columbia.edu)**

"When is talking sustainable development not scientific in your opinion? What 'bothers' you about that term?"

When population and environmental experts talk sustainable development they are playing right into the hands of forces of consumption and exploitation. In addition it makes the public at large think that something is being done whereas the forces of consumption and exploitation are on the ascendancy and are stronger than ever.

"I'm not sure what it means to be a scientist in the sky.."

A scientist that is motivated purely by what his/her science dictates to be the correct solution to the particular problem ie. not motivated by fuzzy human values and preconceptions, not motivated by self interest and above all not motivated by fear of being politically incorrect.

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**Date: Wed, 23 Apr 2003 08:11:39 -1000**  
**From: Vinod Mishra <mishra@hawaii.edu>**  
**Subject: Re: [PERNSeminar\_Deforestation] Harmonization in Land Change Science**  
**To: pernseminars@ciesin.columbia.edu**

Thanks for pointing out the East-West Center effort at compiling survey instruments from a number of land-use/cover case studies. These are mostly from the projects that participated in a workshop last year to understand methodological and practical issues in linking social science and remote sensing data to study human impacts on land-use/cover change. A book based on the papers presented at this workshop has just been published by Kluwer (Fox et al. 2003). This is a good beginning for comparing methodologies, but we need to take the next steps of designing comparative analyses of data from existing case studies, and eventually designing comparative studies using more standardized instruments.

Regarding the agricultural intensification meta-analysis, I have looked at linkages between population growth, socioeconomic development, and agricultural intensification using district-level data for India for 1951, 1961, 1971, 1981, and 1991. The study finds, in both cross-sectional and longitudinal multivariate analyses, that population growth has positive and significant effects on each of the three dimensions of intensification--cropping frequency, artificial irrigation, and chemical fertilizer use--considered. The effects of the socioeconomic variables are generally insignificant and do not alter the effects of population growth (Mishra 2002).

Fox, J., R.R. Rindfuss, S.J. Walsh, V. Mishra. 2003. People and the Environment: Approaches for Linking Household and Community Surveys to Remote Sensing and GIS. London: Kluwer Academic Publishers.

Mishra, V. 2002. "Population growth and intensification of land use in India. International Journal of Population Geography 8: 365-383.

Vinod Mishra

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**From: "Bill McConnell" <wjmcconn@indiana.edu>**  
**To: <pernseminars@ciesin.columbia.edu>**  
**Subject: Re: [PERNSeminar\_Deforestation] Harmonization in Land Change Science**  
**Date: Wed, 23 Apr 2003 14:00:59 -0500**

One of the most interesting comparative analyses of population-environment linkages in recent years was conducted by the national academies of science of India, China and the US, each reporting on two case studies of regions with high population growth. Their three main findings are:

- 1) "The Intertwined Aspects of Population, Consumption and Technology...the impact of technology on the environment was found to be positive or negative, depending on the situation." I have noticed that the discussion in the present seminar has tended to focus on the first and second, while attention to the third term in Erhlich et al's IPAT formulation - technology - has been rather muted.
- 2) "Stability and Change on the Land...Contrary to common perceptions, forest areas seem to be stable or even increasing in the study regions of high population density. Grassland and wetland areas, by contrast, are declining and may be more at risk of land use transformation."
- 3) "The Importance of Government Policy...Of the various factors mentioned, government policy seems to have the greatest single effect on land use change."

This project constitutes a good example of the kind of in-depth comparative analysis needed.  
Information can be found at: <http://www.nap.edu/books/0309075548/html/>.

Bill McConnell

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**From: Anna Babette Wils <awils@tellus.org>**  
**To: <pernseminars@ciesin.columbia.edu>**  
**Subject: [PERNSeminar\_Deforestation] seminar drawing to a close**  
**Date: Wed, 23 Apr 2003 16:02:25 -0400**

Dear Participants,

In a few hours, the PERN cyberseminar "Population and Deforestation" will close -- we have had, in particular in the past week, an increasingly lively debate, and I thank all of those who have contributed. In particular, I would like to thank our expert panel and the authors of the discussion paper, Helmut Geist and Eric Lambin, for the time and thought that went into their statements. These have provided a unique, broad, and insightful collection of views on the causes of deforestation.

While the seminar is closing, it is just the beginning of a consolidation effort in which we hope to bring together the statements prepared by the panel, and to invite other experts to contribute to a an article on where the discussion regarding causes of deforestation now stands -- including broad agreements and still unresolved disputes.

PERN will post a summary of the discussion within the next week. This is not intended as a consolidation, nor will it be possible to accurately reflect every participant's views. However, I will do my best to be fair to all of those who contributed.

Once again, with many thanks to all of you, and I hope you will join us in future discussions,

Greetings,

Babette Wils  
PERN Coordinator

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