From:

Anna-Katharina Hornidge, Christoph Antweiler (eds.)

Environmental Uncertainty and Local Knowledge

Southeast Asia as a Laboratory of Global Ecological Change

September 2012, 284 p., 32,80 €, ISBN 978-3-8376-1959-1

Southeast Asia is a laboratory showing current worldwide ecological issues. Environmental change, natural resource exploitation as well as global climate change increasingly threaten people's livelihoods. Environmentally-based uncertainties foster a high level of knowledge uncertainty. This poses a constantly growing threat to agricultural production. Vulnerable communities with a low degree of resilience are most severely affected.

But local communities have abilities to innovate and develop locally embedded coping strategies. The contributors of this volume are most interested in environmental change that fosters knowledge uncertainties. Regions discussed include the Mekong Delta in Vietnam, Moluccas, Central Kalimantan, West Sumatra and South Sulawesi in Indonesia and Tangail Region in Bangladesh.

Anna-Katharina Hornidge (Dr.) is a sociologist and currently Senior Researcher at the Center of Development Research, Bonn University, Germany.

Christoph Antweiler (Prof. Dr.) is an anthropologist and head of the Southeast Asia Department at the Institute for Oriental and Asian Studies, Bonn University, Germany.

For further information:
www.transcript-verlag.de/ts1959/ts1959.php

Table of Contents

Introduction

The Nexus of Agency, Knowledge, and Environmental Change in Southeast Asia

CHRISTOPH ANTWEILER AND ANNA-KATHARINA HORNIDGE

Headlines about Southeast Asia in the global media refer prominently to either economic miracles or to ecological disasters. Both of these images are not beyond the point, but they portray only parts of the reality of a notoriously complex region. What is more important is that these perspectives tend to focus on the pinnacles of change while concealing the continuous processes of socio-economic and environmental changes of which they are a part.[1] This book takes the opposite perspective by bringing together theory-guided empirical research, largely conducted in the rural areas of Southeast Asia, on the linkage between environmental change processes and human actions taken to live with these. Particular interest lies in the role of different types of knowledge, i.e. local, localized external, global-expert knowledge, and their mobilization and further development to match changes in nature – the basis of livelihood provision. The disciplinary approaches taken range from (environmental and knowledge) sociology, cultural anthropology, and Southeast Asian studies to human ecology and anthropologically-informed botany.

1 For a general orientation on change in Southeast Asia see the following anthologies, introductory monographs, and overview articles: on change in the region in general see Schmidt et al. (1997), Neher (2000); on economic change and development see Savage et al. (1998), Rigg (2001, 2002), McGregor (2008); on political change Vatikotis (1995), specifically on institutional change Sjohölm & Tongzon (2004), Weller (2005), on identity change Slama (2009), on social and especially ethnic change see O'Connor (1995), Winzeler (2010) and Adams & Gillogly (2011).

AN AREA AS A LABORATORY OF GLOBAL CHANGE

Environmental changes as the consequences of ecosystem and natural resources exploitation, as well as changes in the global climate, are increasingly severe, worldwide in scale, and partially irreversible. It is for this reason that geologists and climatologists are debating whether our planet has entered a new geologic age, the era of the *Anthropocene* (Crutzen 2002, Crutzen/ Stoermer 2000, Zalasiewicz et al. 2010).

In Southeast Asia the impacts of economic activities on the natural environment have been observed since early colonial times. These effects were often large-scale and sometimes pertained to whole landscapes. Ecological change caused or mediated by human activity is thus an old theme in the sociological and anthropological study of the region (e.g. Geertz 1963, King 1998, Vayda 1983, 2006, Wallace 2005). More recent debates nevertheless increasingly distinguish between, and jointly address globally, climate change-induced as well as locally-induced environmental consequences.

On the global, climate change-induced consequences for Southeast Asia,[2] the Intergovernmental Panel on Climate Change (IPCC) projects a regional increase in temperature of about 2.5°C, thus matching the global average (IPCC 2007a: ch. 11). Rainfall is estimated to increase by 7 per cent, but will concentrate on certain regions. Due to the complex landscape in island Southeast Asia and the importance of the sea for the local climate, local developments can also strongly differ from regional trends. Indonesia, for example, is projected to be heavily affected by rising sea levels: with a rise of 1m, 2,000 islands and 400,000ha land will be lost (IPCC 2007b: 485). In addition, temperatures are likely to rise relatively more in the inner parts of the islands, leading to reduced rainfall and to longer dry seasons and droughts (Hulme/Sheard 1999). In the areas where rainfall increases, the tendency for heavy rainfall to arrive suddenly also increases (IPCC 2007a: 886), with erosion and flooding as consequences. Besides these globally-induced changes, locally-induced changes can be observed, prominent examples being the cutting down of rainforest for timber (Dauvergne 1997, 2001) and palm oil plantations (Pye 2010).

The effects of these locally- and globally-induced changes range from local consequences, such as seasonal flooding, droughts, or salinized soils, to regional

2 For geographic overviews see Potter et al. (1995) and Gupta (2005) on physical matters and Chia Lin Sien (2003) for a human geography textbook focused on change in the region. Vorlaufer (2011) masterfully combines physical and human geography and provides numerous cases, facts and data on current change. For a bibliography explicitly limited to area-overview publications see Antweiler (2004).

hazards, such as the regularly occurring haze in the Straits of Malacca. And similarly, measures taken to cope with and adapt span from the level of the acting individual to transboundary initiatives (Kasperson et al. 1995, Badenoch 2002, Nguitragoo 2011). The precise design and implementation of these measures is often influenced by a mix of globally influenced local conceptions of the environment and nature. Conceptions and perspectives become practically effective for action, e.g. for environmental education (Yenken et al. 2000). Among politically important concepts are images of entities such as the tropics, the jungle, water, rivers, tribes, peasants, preservation, and development.[3] All of those concepts express views of culture and society (Greenough/ Tsing 2003) and at the same time have an impact on land-use schemes, forest management, biological classification, water control strategies, and community-based conservation measures.

There are winners and losers in this struggle for resources and environment. Thus, there are also constant volatile tensions and conflicts, resulting in increasing environmental movements and campaigning since the 1980s (see Argyrou 2005). These movements tend to react to very concrete problems such as logging, the building of elite golf courses, or tourist development, so these activities normally have a local focus (Kalland/ Persoon 1998, Dupar/ Badenoch 2002), while often being linked with environmentalist activities in western countries. Others, such as the growing palm-oil industry, are also mediated by worldwide processes, but only link specific regions (here the EU, India, Pakistan) outside Southeast Asia and selected countries (here Malaysia and Singapore) within the region, thus being transnational without being truly global (Pye 2010).

Southeast Asia is consequently a site of contradictions between uneven economic growth, with severe environmental effects, on the one hand and a widely shared aim of environmental protection on the other. Different sections and groups motivated by different interests compete for shares in the resource base (see cases in Resosudarmo/ Jotzo 2009). Beyond that, they not only compete over resources but also battle over the very process of environmentally relevant decision-making. We are dealing with issues that form the core of political ecology.[4] Environmental issues are one of the most important foci of the coalescence

3 The effects of conceptions of the environment on landscape planning during colonial times has been studied by, amongst others, Boomgaard (2007), Boomgard et al. (1997, 2005), Grove et al. (1998), Colombijn (1997), Ingold (2000), Ellen/ Fukui (1996).

4 See e.g. Atkinson (1991), Blaikie (1999), Biersack (2006), Bryant (2001), Zimmerer/ Bassett (2003), Paulson (2004), Whitehead et al. (2007), Rangan/ Kull (2009), Robbins et al. (2010), Robbins (2012); especially pertaining global issues see Peet et al. (2011), regarding the knowledge interface see Croll/ Parkin (1992).

of social forces and of the building of alliances and strategic groups (cf. Hirsch & Warren 1998 Greenough & Tsing 2003). In consequence, conservationists and environmental movements cannot be understood in terms of protest against environmental destruction alone, but additionally as a form of political resistance or more generally an idiom of cultural critique (Kalland/ Persoon 1998). The environmental changes and uncertainties attached to them nevertheless impede on cash and food crop agriculture, and here especially those whose systems of livelihood provision directly depend on the environment, namely urban and even more so rural poor.

ECOLOGICAL UNCERTAINTY AND HUMAN INSECURITY

Research into environmental uncertainty is flawed by the fact that there is a lack of integration between studies into issues of uncertainty with research on insecurity. This seems to be a problem, since uncertainty and human existential insecurity are often linked, for instance as factors in human actions, especially in decision-making. Human well-being is a central concern of development policies and measures. A key element for allowing well-being is human security.

Since 9/11, security has been a buzzword of debates about globalization. Courses in 'Security Studies' are proliferating, especially in the US and Southeast Asia, so it is no wonder that security issues tend to be discussed only in relation to material aspects, economic issues, or physical security (Eriksen et al. 2010: 5-8). The aims are typically formulated along material or physical dimensions as "freedom from want" or "freedom from fear". The bulk of current work is policy-oriented and argues on the macro-level. Against all slogans of "Putting People First," local people are seldom placed first. Thus, most conventional accounts do not take non-material considerations of security and insecurity into account. Especially the experience-near dimensions of insecurity are often overlooked. Both the human condition of insecurity and a status of uncertainty are often directly linked to collective identity (Salemink 2010: 262f.).

Uncertainty and insecurity have to do with belonging and social cohesion, which are related to human scales and locales. Politicians and economists concerned with globalization constantly ask for flexibility, and they praise spatial freedom. The current stars of 'post'-theorizing in contemporary cultural studies, despite often being quite critical of globalization, are celebrating movement and flexibility as well. At the same time, social scientists all over the world observe people investing a lot of work and brains into developing their specific locales, establishing secure livelihoods, and gaining a little certainty.

Changes in seasonal timing, rainfall patterns, and temperature scales, as currently experienced by people across Southeast Asia, therefore lead to a constant increase in uncertainties, insecurities and a lack of safety, as discussed by Beck (2007, 1996): While 'uncertainties' result from the loss of belief in science and expert knowledge, 'insecurities' are a loss of social security due to the depletion of the social welfare system or, in the presently discussed context, the system of livelihood provision. A 'lack of safety' results from threats to health and life, such as poisoned food, violence, or life-threatening floods. Others, as for example the STEPS Center in Sussex (Hornidge, this volume), identify four types of incertitude, each characterized by different forms of incomplete knowledge, while others again (Walker et al. 2003 in Deswandi et al., this volume) point to the lack of a shared understanding of the concept of 'uncertainty' amongst scientists.

What is nevertheless of immediate relevance to this volume is that environmentally-based uncertainties are especially pressing, since environmental change fosters a high level of knowledge uncertainty, the not knowing of how different localities are affected, to what degree, how to cope with it as well as how to adapt to the changed conditions. This ignorance poses an immediate and constantly growing threat for agricultural production throughout Southeast Asia, and so it especially affects vulnerable communities with a low degree of resilience.

While this has been noted by many national decision-making bodies, international organizations, and development practitioners, the uncertain prognosis on which environmental changes will affect different localities – and how – poses an immense challenge to the local as well as the external formulation of responsive strategies. The realization of the effects of environmental changes due to climate change, as well as ecosystem exploitation and respective degradation, therefore structures thinking and guides action in Max Weber's understanding. Yet, uncertainty surrounding the precise effects of climate change on different localities and communities challenges systematic responses further, and locally embedded adaptations to the ongoing changes become even more pertinent than before. The abilities of local communities to innovate, to modify their existing stocks of knowledge, and to develop locally embedded coping, as well as adaptation strategies that enable local communities to stay rather than migrate, are challenged.

OVERVIEW OF THE BOOK

The chapters of this volume discuss issues of environmental change, increased feelings of uncertainties posing threats to everyday livelihood provision in

Southeast Asia, and local means of attaching sense and taking actions towards coping with and adapting to these changes. Especially (but not exclusively) rural areas and local responses come under focus. In our reading of the issue at hand, we look mainly at environmental change that fosters knowledge uncertainties. This issue regards questions such as how do local communities perceive environmental changes affecting their ecosystem? How do they deal, cope with, and adapt to them? What are the responses of the local knowledge and innovation systems in place to the challenges that lie ahead?

In Chapter 1, following this introduction, *Anna-Katharina Hornidge* critically reflects on the notion of 'knowledge' in development discourses of the past 20 to 30 years, by focusing on (a) ongoing debates on the construction of 'information' and 'knowledge societies'; (b) the notion of 'knowledge for development', as put forth by international donor organisations; (c) global initiatives for the bridging of 'the global digital divide' summarized under 'ICTs for development'; (d) the current turn towards 'innovations and 'innovation systems'; and (e) upcoming debates on the adaptive capacities of 'knowledge' for living with change processes. She links a social constructivist definition of knowledge as everything that is regarded as knowledge in and by society (Berger/ Luckmann 1966, 1984) with current discourses of 'knowledge' in development. Therefore, the potentially all-encompassing character of 'knowledge' is discussed along the line of a 'boundary concept' (Mollinga 2008, 2010) and thus heuristic space for conceptual exchange and practical cooperation. In development, nevertheless, these were largely filled by those already defining what was regarded as 'knowledge' in actual projects of development cooperation.

This overview and introduction into 'knowledge' in current development discourses is then followed, in Chapter 2, by a combination of generalizing theory and localizing methodology by *Christoph Antweiler*. The methodological part assesses local knowledge through the application of simplified and locally adapted methods taken from cognitive anthropology. The theory part of this paper presents a general model of local knowledge which outlines ten interrelated qualities of local knowledge. These are exemplified using ethnographic field research on the environmental and migration-related knowledge of urban citizens in Makassar, Indonesia. Based on this research, the paper discusses local knowledge as a specific form of knowing and rationality found in societies worldwide.

Chapter 3, by *Christian Reichel*, *Sofie Elena Martens* and *Arne Harms*, empirically remains in Indonesia, studying culturally mediated perceptions, forms of knowledge-specific and quotidian interactions and cognitions in living with environmental changes in the Taka Bonerate atoll and the Spermonde Archipel-

ago in South Sulawesi. Both research sites are affected by similar environmental changes and their consequences (i.e. the destruction of coral reefs, significant losses in biodiversity, overfishing, etc.). And in consequence the frames of reference structuring how these environmental changes are experienced, understood, and acted upon (and thus the potential of violent conflict being employed) also vary significantly. As a window into these fluctuating relations, the authors concentrate on local environmental knowledge (LEK), emphasizing its constant reiteration, not only with regard to the material, environmental conditions but also equally within wider frames of reference.

The mobilization of varying knowledge reference systems also forms the focus of Chapter 4, by *Judith Ehlert*. Here, taking the Mekong Delta, Vietnam, as a case, the author studies the integration of traditional weather lore and scientific weather forecasting as a local strategy commonly applied by farmers and fishers, to adapt to changes in the natural environment. Actors are capable of drawing on plural modes of environmental knowledge with reference to flood and weather variability, in order to back up agricultural decision-making. This process of local knowledge hybridization, or 'local weather knowing' as termed by Ehlert, serves as an adaptive strategy used to encounter environmental changes. The empirical assessment of integrating both knowledge reference systems into everyday farming routines therefore further substantiates ongoing discussions on cultural-ecological pragmatism inherent in people's relationships with their natural environment.

Similarly, Chapter 5 by *Paul Sillitoe* and *Mahbub Alam*, studies local farmers' and fishers' assessments of, and practices of adaptation to, environmental changes. But, differently to earlier chapters, the authors concentrate on environmental changes resulting from the construction of flood defenses under the World Bank-funded Flood Action Plan (FAP) and their impacts on subsistence activities across the Bangladeshi floodplain. We included this example from South Asia, as it shows dynamics found also in parts of Southeast Asia. Here, the risks involved in implementing external 'solutions', without a full understanding of the local situation, are discussed and lessons formulated for future policy-making. One of the main lessons learned is the need to, even more so than already done, cultivate a mindset in international development cooperation by first learning from local views. Knowledge evolved over generations should be consulted before implementing external ideas, which is particularly true in a situation such as that seen in the Bay of Bengal, where people are well-equipped to handle the uncertainties of climate change, a region where floods, droughts, and cyclones have been features of everyday life for millennia. These lessons could

be used for current development measures in Southeast Asia, e.g. in the Mekong Delta.

Living with ecological extremes that in themselves are not new, but in their occurrence and outreach increase, is also taken up by *Viola Bizard* in Chapter 6. Based on anthropological research carried out on the boundaries of the tropical peat swamp forest of Sebangau in Central Kalimantan, the chapter documents the stories and experiences of those living with recurrent fires. How do they explain, perceive, and manage the fires? The practices of fire management are discussed with regard to regulatory customary law (*adat*) and at the same time with reference to existing constraints in mitigating, coping with, and even gaining from fires. As such, the two case studies offer insights into the fire risks in Indonesia's peatlands and their emic evaluation as positive (i.e. potential of a successful swidden cycle), as well as negative (i.e. potential damage to personal property and thus social conflicts and political sanctions) to be considered in externally developed mitigation strategies.

Roy Ellen and *Hermien L. Soselisa*, in Chapter 7, discuss cassava (*Manihot esculenta*) diversity and the local practices of production and consumption in Nuaulu village on the island of Seram and Debut on the Kei archipelago, both in eastern Indonesia. Precisely, the authors study the role of cassava toxicity in agricultural production, nutrition, and change adaptation. Both cases suggest that cassava will gain additional importance in coping with changed environmental conditions. Yet, in Nuaulu it is likely to gain importance as a secondary 'fallback' crop, and the local ecology will allow the production of a narrow range of mostly sweet cassava only, while in the Kei islands the heavy reliance on bitter cassava as a strategy for ensuring food security is further enhanced by growing an increasingly diverse range of cassava folk varieties in response to farming uncertainty under changing conditions.

Local forms of coping with and adapting to environmental changes while assuring livelihood provision also represent the core of Chapter 8, by *Rio Deswandi, Marion Glaser* and *Sebastian Ferse*. Based on empirical research in Sungai Pisang, West Sumatra and the Spermonde Archipelago in eastern Indonesia, the authors particularly address institutional adaptability and thus the capacity to (re)allocate natural resource use rights in order to allow for the local employment of coping strategies for fishing households in the face of growing food insecurity. The authors argue that this institutional adaptability to ever-changing environments forms the basis of a resilient social system. Continuing fishing practices, part of prevalent local coping strategies, nevertheless threaten the sustainability of the ecological system and result in an imbalance between ecological and social resilience. The authors here point to the need for the local devel-

opment of scientifically informed coping strategies and thus a stronger integration of scientific forms of knowledge into local coping and adaptation strategies.

The book closes with an afterthought by *Fabian Scholtes*. As the in-house expert of an aid agency, and at the same time an academic who has worked intensively on the topics at hand, he discusses the orchestra of chapters with regard to their contributions to ongoing academic debates on knowledge in change adaptation, as well as their potential practical value. His critical and constructive remarks on the contributions encourage the editors and authors – as well as you, our readers – to explore further the interlinkage of environmental changes, uncertainties, and knowledge in shaping change processes. It is in the nexus of environmental change and local ways of making sense of, coping with, and adapting to them that the interdisciplinary and empirically-based case studies presented here offer exemplary insights into Southeast Asia as a laboratory of global change.

REFERENCES

Adams, K. M./Gillogly, K. A. (eds.) (2011): Everyday Life in Southeast Asia. Bloomington & Indianapolis: Indiana University Press.

Antweiler, Ch. (2004): Southeast Asia: A Bibliography on Societies and Cultures. Münster: Lit Verlag/Singapore: Institute of Southeast Asian Studies (ISEAS).

Argyrou, V. (2005): The Logic of Environmentalism: Anthropology, Ecology, and Postcoloniality. London/New York: Routledge.

Atkinson, A. (1991): Principles of Political Ecology. London: Belhaven Press.

Badenoch, N. (2002): Transboundary Environmental Governance: Principles and Practice in Southeast Asia. Washington, D.C.: World Resources Institute.

Beck, U. (1996): Das Zeitalter der Nebenfolgen und die Politisierung der Moderne. In: Beck, U./Giddens, A. (eds.): Reflexive Modernisierung: Eine Kontroverse. Frankfurt/Main: Suhrkamp. 19-112.

Beck, U. (2007): Weltrisikogesellschaft. Frankfurt/Main: Suhrkamp.

Berger, P./Luckmann, T. (1966): The Social Construction of Reality. Garden City, New York: Anchor Books.

Berger, P./Luckmann, T. (1984): Die Gesellschaftliche Konstruktion der Wirklichkeit: Eine Theorie der Wissenssoziologie. Frankfurt/Main: Fischer Taschenbuch Verlag.

Biersack, A. (2006): Reimagining Political Ecology: Culture, Power, History, Nature. In: Biesack, A./Greenberg, J. P. (eds.): Reimaging Political Ecology.

Durham & London: Duke University Press (New Ecologies for the Twenty-First Century). 3-40.

Blaikie, P. (1999): A Review of Political Ecology: Issues, Epistemology and Analytical Narratives. Zeitschrift für Wirtschaftsgeographie 43(3-4). 131-147.

Boomgaard, P. (ed.) (2007): A World of Water: Rain, Rivers and Seas in Southeast Asian Histories. Leiden: LITLV Press.

Boomgaard, P./Colombijn, F./Henley, D. (eds.) (1997): Paper Landscapes: Explorations in the Environmental History of Indonesia. Leiden: KITLV Press.

Boomgaard, P./Henley, D./Osseweijer, M. (eds.) (2005): Muddied Waters: Historical and Contemporary Perspectives on Management of Forests and Fisheries in Island Southeast Asia. Leiden: KITLV Press.

Bryant, R. L. (2001): Political Ecology: A Critical Agenda For Change? In: Castree, N./Braun, B. (eds.): Social Nature: Theory Practice, and Politics. Malden/Oxford: Blackwell Publishers. 151-169.

Chia, L. S. (ed.) (2003): Southeast Asia Transformed: A Geography of Change. Singapore: Institute of Southeast Asian Studies (ISEAS) (Environment and Development Issues, 7).

Colombijn, F. (1997): The Ecological Sustainability of Frontier societies in Eastern Sumatra. In: Boomgaard, P./Colombijn, F./Henley, D. (eds.): Paper Landscapes: Explorations in the Environmental History of Indonesia. Leiden: KITLV Press. 309-339.

Croll, E./Parkin, D. (eds.) (1992): Bush Base, Forest Farm: Culture, Environment and Development. London/New York: Routledge (EIDOS; European Inter-University Development Opportunities Study Group).

Crutzen, P. J. (2002): Geology of Mankind. Nature 415. 23.

Crutzen, P. J./Stoermer, E. F. (2000): The 'Anthropocene'. Global Change Newsletter 41. 17–18.

Dauvergne, P. (1997): Shadows in the Forest: Japan and the Politics of Timber in Southeast Asia. Cambridge: The MIT Press (Politics, Science & the Environment).

Dauvergne, P. (2001): Loggers and Degradation in the Asia-Pacific: Corporations and Environmental Management. Cambridge: Cambridge University Press (Cambridge Asia-Pacific Studies).

Dupar, M. K./ Badenoch, N. (2002): Environment, Livelihoods and Local Institutions: Decentralization in Mainland Southeast Asia. Washington, D.C.: World Resources Institute.

Ellen, R. F./Fukui, K. (eds.) (1996): Redefining Nature: Ecology, Culture and Domestication. Oxford/Washington, D.C.: Berg (Explorations in Anthropology).

Eriksen, T. H. (2010): Human Security and Social Anthropology. In: Eriksen, T. H./ Bal, E./Salemink, O. (eds.): A World of Insecurity: Anthropological Perspectives on Insecurity. London/New York: Pluto Press (Anthropology, Culture & Society). 1-19.

Geertz, C. J. (1963): Agricultural Involution: The Processes of Ecological Change in Indonesia. Berkeley: University of California Press.

Greenough, P. R./Lowenhaupt Tsing, A. (eds.) (2003): Nature in the Global South: Environmental Projects in South and Southeast Asia. Durham/London: Duke University Press.

Grove, R. H./Damodaran, V./Sangwan, S. (eds.) (1998): Nature and the Orient: The Environmental History of South and Southeast Asia. Oxford: Oxford University Press.

Gupta, A. (ed.) (2005): The Physical Geography of Southeast Asia. New York: Oxford University Press.

Hirsch, P./Warren, C. (eds.) (1998): The Politics of Environment in Southeast Asia: Resources and Resistance. London/New York: Routledge.

Hulme, M./Sheard, N. (1999): Climate Change Scenarios for Indonesia. Norwich: Climate Research Unit.

Ingold, T. (2000): The Perception of the Environment: Essays on Livelihood, Dwelling and Skill. London/New York: Routledge.

IPCC (2007a): Climate Change 2007: The Physical Science Basis. Contribution of working group I to the fourth assessment Report of the Intergovernmental Panel on Climate Change. Cambridge/New York: Cambridge University Press. Available at: www.ipcc.ch/ipccreports/ar4-wg1.htm

IPCC (2007b): Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the IPCC. Cambridge/New York: Cambridge University Press. Available at: www.ipcc.ch/ipccreports/ar4-wg2.htm

Kalland, A./Persoon, G. (1998): An Anthropological Perspective on Environmental Movements. In: Kalland, A./ Persoon, G. (eds.): Environmental Movements in Asia. Richmond: Curzon Press (Nordic Institute of Asian Studies, Man & Nature in Asia Series, 4). 1-43.

Kasperson, J. X./Kasperson, J. E./Turner, B. L. (eds.) (1995): Regions at Risk: Comparisons of Threatened Environments. Tokyo et. al.: United Nations University Press.

McGregor, A. (2008): Southeast Asian Development. London/New York: Routledge (Routledge Perspectives on Development).

Mollinga, P. (2008): The Rational Organisation of Dissent. Bonn: ZEF Working Paper Series, Center for Development Research, University of Bonn, 33.

Mollinga, P. (2010): Boundary Work and the Complexity of Natural Resources Management. In: Crop Science, 50. 1–9.

Nguitragoo, P. (2011): Environmental Cooperation in Southeast Asia: ASEAN's Regime for Transboundary Haze Pollution. London/New York: Routledge (Routledge Contemporary Southeast Asia Series, 29).

O´Connor, R. (1995): Agricultural Change and Ethnic Succession in Southeast Asian States: A Case for Regional Anthropology. In: Journal of Asian Studies 54. 968-996.

Paulson, S./Gezon, L. L. (eds.) (2004): Political Ecology Across Spaces, Scales and Social Groups. New Brunswick: Rutgers University Press.

Peet, R./Robbins, P./Watts, M. J. (eds.) (2011): Global Political Ecology. London/New York: Routledge.

Potter, L./Brookfield, H./Byron, Y. (1995): The Eastern Sundaland Region of South-East Asia. In: Kasperson, J. X./Kasperson, J. E./Turner, B. L. (eds.) (1995): Regions at Risk: Comparisons of Threatened Environments. Tokyo et. al.: United Nations Uni-versity Press. 460-507.

Pye, O. (2010): The Biofuel Connection: Transnational Activism and the Palm Oil Boom. In: Journal of Peasant Studies 37(4). 851–874.

Rangan, H./Kull, C. A. (2009): What Makes Ecology 'Political'? Rethinking "Scale" in Political Ecology. Progress in Human Geography 33(1). 28-45.

Resosudarmo, B. P. /Jotzo, F. (eds.) (2009): Working with Nature against Poverty: Development, Resources and the Environment in Eastern Indonesia. Singapore: Institute of Southeast Asian Studies (Indonesia Project, the Australian Natinal University).

Rigg, J (2001): More than the Soil: Rural Change in Southeast Asia. Harlow: Prentice Hall, Pearson Education.

Rigg, J. (2002): Southeast Asia: The Human Landscape of Modernisation and Development. London/New York: Routledge.

Robbins, P. (2012): Political Ecology: A Critical Introduction. London: Wiley Blackwell (Critical Introductions to Geography).

Robbins, P. J. / Hintz, J. /Moore, S. A. (2010): Environment and Society: A Critical Introduction. London: Wiley Blackwell (Critical Introductions to Geography).

Salemink, O. (2010): Ritual Efficacy, Spiritual Security and Human Security: Spirit Mediumism in Contemporary Vietnam. In: Eriksen, T. H./Bal,

E./Salemink, O. (eds.): A World of Insecurity: Anthropological Perspectives on Insecurity. London/New York: Pluto Press (Anthropology, Culture & Society). 262-289.

Savage, V. R./Kong, L./Neville, W. (1998): The Naga Awakens: Growth and Change in Southeast Asia. Singapore: Times Academic Press.

Schmidt, J./Dragsbaek, J. H./Fold, N. (eds.) (1997): Social Change in Southeast Asia. Harlow: Longman.

Sjohölm, F./Tongzon, J. (eds.) (2004): Institutional Change in Southeast Asia. Richmond: RoutledgeCurzon (European Institute of Japanese Studies, East Asian Economics and Business Series).

Slama, M. (ed.) (2009): Konflikte, Mächte, Identitäten: Beiträge zur Sozialanthropologe Südostasiens. Wien: Verlag der Österreichischen Akademie der Wissenschaften (Österreichische Akademie der Wissenschaften, Philosophisch-Historische Klasse, Sitzungsberichte, 785).

Vatikotis, M. R. J. (1995): Political Change in South-East Asia: Trimming the Banyan Tree. London/New York: Routledge (Routledge in Asia).

Vayda, A. P. (1983): Progressive contextualization: Methods for research in human ecology. In: Human Ecology 11(3). 265-281.

Vayda, A. P. (2006): Causal Explanation of Indonesian Forest Fires: Concepts, Applications and Research Priorities. Human Ecology 34. 615-635.

Vorlaufer, K. (2011): Südostasien: Brunei, Indonesien, Kambodscha, Laos, Malaysia, Myanmar, Osttimor, Philippinen, Singapur, Thailand, Vietnam. Darmstadt: WBG (Wissenschaftliche Länderkunden).

Walker, W. E./Harremoës, P./Rotmans, J./van der Sluijs, J. P./van Asselt, M. B. A./Janssen, P./von Krauss, M. P. K. (eds.) (2003): Defining Uncertainty: A Conceptual Basis for Uncertainty Management in Model-Based Decision Support. In: Integrated Assessment 4/1. 5-17.

Wallace, B. J. (2005): The Changing Village Environment in Southeast Asia: Applied Anthropology and Environmental Reclamation in the Northern Philippines. London/New York: Routledge Chapman & Hall (Modern Anthropology of South-East Asia).

Weller, R. P. (2005): Civil Life, Globalization and Political Change in Asia: Organizing Between Family and State. London/New York: Routledge.

Whitehead, M./Jones, R./ Jones, M. (2007): The Nature of the State: Excavating the Political Ecologies of the Modern State. Oxford: Oxford University Press (Oxford Geographical and Environmental Studies).

Winzeler, R. L. (2010): The Peoples of Southeast Asia Today: Ethnography, Ethnology, and Change in a Complex Region. Lanham: Altamira Press.

Yenken, D./Fien, J./Skes, H. (eds.) (2000): Environment, Education and Society in the Asia-Pacific: Local Traditions and Global Discourses. London/New York: Routledge (Routledge Advances in Asia-Pacific Studies, 1).

Zalasiewicz, J./Williams, M./Steffen, W./Crutzen, P. (2010): The New World of the Anthropocene. In: Environmental Science & Technology 44 (7). 2228-2231.

Zimmerer, K. S./Bassett, T. J. (eds.) (2003): Political Ecology: An Integrative Approach to Geography and Environment-Development Studies. New York: Guilford Press.