

Formulating new plantation studies

The distinction between what constitutes a social and a natural domain continues to make communication for researchers in these two areas an uneasy task. The current confluence of geosphere, biosphere, and human society under global capitalism, however, is too important to be addressed in any way other than through a trans-disciplinary approach. We can no longer afford to be in isolation and separation when investigating relations between natural and social systems. In this article, I would like to introduce our challenge to conventional anthropocentric perspectives in the social sciences by examining connections and changing relations between nature and non-nature. We do so in one part of Southeast Asia that is under spatial reconfiguration through the dispossession of biomass and land.

Noboru Ishikawa



The logging-plantation nexus in Borneo

Equatorial zones in Southeast Asia possess a high concentration of biomass due to a combination of abundant solar energy and heavy rainfall. Hydrothermal circulation makes tropical rain forests prime fertile grounds for the regeneration and commodification of natural and agricultural resources. From the age of commerce to the present, Borneo's biomass has long been linked to the outside world through numerous commodity chains, i.e., networks of labor and production processes connecting distant peoples and landscapes.

For more than half a century, global commodity chains surrounding Borneo have converged into a couple of distinctive yet symbiotic modes of resource appropriation: logging and plantation. From Sabah in the 1960s, then to Kalimantan and consequently to present day Sarawak, there has been an evolving relationship between logging operations and the rise of the plantation industry. The development of the logging-plantation nexus marked a shift in commodification from the one based on the regeneration of biomass to the other that depends on expansive production of planted vegetation. With the clearance of forests, an irreversible transformation has led to fundamental changes in social formation. The object of appropriation has shifted from biomass on land to land itself.

Multi-species, multi-landscape, and multi-disciplinary research

Sarawak is a final resource frontier in Borneo. It thus provides us with a last opportunity to examine the dynamics of human/nature relations under large-scale ecological transformation. Since 2010, a five-year project has been under way to comprehensively document and understand the process of changes taking place in Bintulu District, northern Sarawak, Malaysia, where 57% of the land (12,166.2 km²) has been converted to plantation fields as of 2011.¹ We have been investigating a tipping point for determining a critical balance between the geosphere, biosphere and local communities by assessing necessary trade-offs and new synergies for sustainability and survivability.

The project is ambitious in that it involves the collaboration of some 20 researchers who specialize in anthropology, geography, Southeast Asian history, global history, area studies, political ecology, environmental economics, sociolinguistics, plant ecology, animal ecology, forest ecology, hydrology, ichthyology, geomorphology and life-cycle assessment. For these researchers to engage in their own fieldwork as well as collaborative sub-projects, a basin catchment composed of two riverine systems, the Kemena and the Tatau, are selected as a unit of analysis. Ecologically, the basin catchment is a mosaic landscape of oil palm and *Acacia mangium* plantations, logging concession areas, secondary forests, swidden fields and peat land. The basin is also home to numerous social groups: the Malay, Melanau, Vaie Segan, Chinese, Iban, Kayan, Kenyah, Punan Bah, Bekatan, Tatau, Lugat and Penan. Almost all the ethnic groups of Sarawak live side by side, from upstream rivers down to coastal areas.

Conducting fieldwork in this unitary yet inherently heterogeneous socio-ecological space enables us to examine a microcosm of Sarawak, which undergoes immense spatial reconfiguration and concomitant social change. Furthermore, a transdisciplinary and collaborative approach enables the research team to observe multi-species relations and interactions.

The strength of this project thus lies in a strategic combination of field sciences. On one side, the natural sciences deal with material flows such as water, gases and minerals through the physical and biological processes at work in and out of plantations. On the other, the social sciences look into the articulations and disarticulations between natural economy and plantation economy, the effects of road networks linking the interior land to cities as well as hills and plains and the reconfiguration of a local-global relationship through commodity chains.

For instance, the ecological research team analyzes the eco-systems of natural and planted forests in the riverine catchment

Above: Logs and oil palm seeds – coming and going. © Noboru Ishikawa 2007.

where heterogeneous landscapes are observable in sequence. Multiple research plots have been selected by animal ecologists in order to map the spatial structure of biodiversity. Hundreds of camera traps have been set to monitor the movements of animals in and out of plantations as well as timber concessions. While ecosystem ecologists focus on the flows of nitrogen and particulate organic matter in the forests and rivers, hydrologists look into the water cycle in the ocean and atmosphere, the forests and the rivers, in several tens of square kilometers at a meso-scale. These researchers are in charge of examining material cycles of nature, where the transfer of chemicals from biological to geological systems, are observable in mixed landscapes.

The socio-cultural research team focuses on transformations from a traditional natural economy (swidden cultivation, hunting and gathering of forest produce) to off-farm wage labor (at timber camps and urban areas), and to agricultural income-generation (oil palm smallholdings). We have conducted a series of household interviews on topics such as functionally and spatially extended kin networks, circular labor migration and the flows of remittances.

In addition to the emerging rural-urban continuum, the nature/non-nature boundary has become increasingly porous and manipulable. We highlight a number of larger questions concerning the political economy of resource utilization. Plantations are endorsed by international systems of certification and finances. Planted forests of oil palm and *Acacia mangium* as a potential energy source are considered to contribute to reduction of carbon emissions. The financial sector thus seeks to create instruments for the securitization of tropical biomass under the newly proposed REDD (Reducing Emissions from Deforestation and Degradation) and REDD Plus initiative. The result is a dynamic process of negotiation within an increasingly complex nature/non-nature threshold.

In the course of planning this research, we have thus created new methodological devices, scales and units of analysis that enable an integrative, cross-disciplinary understanding

Nature/non-nature relations in Borneo

of nature/non-nature relationships. In a sense, we have consciously forced ourselves out of our own comfort zones by talking to colleagues who possess their own terminology, academic backgrounds, methodologies and ways of engaging research topics. In doing so, we formulated several 'meeting places' for researchers from different disciplinary specialties to work together in the field. The following are some of the sub-projects which social and natural scientists are collaboratively engaging in.

Wild boars, fish, swiftlets and oil palm

With the expansion of planted forests, human relations to other animals have changed, albeit in a rather unexpected way. It has become easier for some inland Dayak people to encounter wild boars (*Sus barbatus*) coming into plantations for an abundant supply of oil palm seeds. The locals also frequently spot barking deer (*Muntjac spp.*) in remaining logged-over forests where they feed on pioneer plant species. The preservation of salt licks (a natural mineral deposit where animals in nutrient-poor ecosystems can obtain essential mineral nutrients) in reduced impact logging concession areas is found to lead to the better conservation of animals in forests. To examine the relation between the diversity and number of living species in ecologically disturbed areas, and how the local natural economy (i.e., hunting and gathering) has subsequently transformed, a group of anthropologists and geographers examine an economic portfolio of longhouses. Alongside, animal ecologists set camera traps to capture mammals for the purpose of examining biodiversity. To cross-check such ecological data and evidence, social scientists collect the narratives of local people on the changing nature of their environs.

The number of river fish has declined. Only catfish such as ikan tapah (Wallago leerii) is strong enough to survive water coming out of logging concessions and plantations. Why? Because they are slimy!

The above is a comment that anthropologists on the research team have often heard from upriver longhouse dwellers. To examine the changing relations among geosphere, biosphere, and human communities, an understanding of the effects of plantation development not only on the ecosystem but also on people's foodways is necessary. Ecologists, by taking numerous samples of water along the river on the other hand, clarify the effects of agro-industrial operations on the forest

Our research project aims at empirically examining how natural systems and social systems articulate and how they have been transformed by the impacts of large-scale land use change.

Below: Forest and plantation converge, Borneo. Photo reproduced under a creative commons license, courtesy of flickr.

ecosystem. This they do in collaboration with ichthyologists (those who study fish), who conduct a biodiversity assessment of the freshwater community.

One of the most valued forests products in the area (with more than 400 years of trading history) are the nests (*sarang burung*) of edible swiftlets (*Aerodramus fuciphagus*). In fact, the nests constitute an important meeting ground for cultural anthropologists, historians (global history and Chinese history) and bird ecologists, to observe how commodity chains and food webs are being reconfigured with the advent of plantations. In the coastal peat lands at the mouth of the Kemena, we have constructed a swiftlet farmhouse for experimental purposes, collecting basic information on laying, hatching and nesting eggs. The farmhouse enables us to examine droppings for nitrogen isotope ratio, an important task, as it provides data concerning the swiftlets' food webs inside and outside plantations. Anthropologists and historians are also collaborating to trace the commodity chains that link Bintulu to the region and further beyond. This leads us to the busy streets of Shuang Wan, Hong Kong and even Chinatown in New York City.

Oil palm has a very peculiar nature. As an industrial commodity, fresh fruit bunches need to be processed within 24 hours, so as to avoid oxidation which lowers the quality of the product. This oxidation, a micro-change at a molecular level, is in fact a driving force of grand social change in our research site, where the traditional riverine society has been transformed to a land-bound one with road networks for transportation of fruit bunches to processing mills. With the advent of roads, many residents have moved to the roadside, at some distance from their longhouses that are traditionally built along the river. Now a long stretch of temporary huts (*langkau* in the Iban language) can be found, and oil palm cultivation on smallholdings has become common. Specialists in the fields of environmental economics, human geography, cultural anthropology and life-cycle assessment, are paying particular attention to the dynamics of oil palm expansion into inland areas where economic activities and kinship relations are based on riverine social networks.

In search of better articulation of social and natural systems

What is the importance of the points of articulation between material cycles and the movements of capital, humans, technologies, and institutions? What are the consequences

of changing connections, not only at local, but also at cross-continental and global scale? How do we locate linkages among non-adjacent and seemingly disconnected locations in nature and society? One of the very challenging endeavors of our research project is to empirically examine how natural systems and social systems articulate and how they have been transformed by the impacts of large-scale land use change.

Both the social and natural sciences have long engaged in the study of connections from within their own disciplinary boundaries: from the community, region and nation-state to empire, or from habitat patches to landscapes. We have scaled and rescaled the units of analysis in time and space to comprehend how constituent parts of systems and distant places are linked. However, such engagements have usually been pursued without connecting ourselves to other disciplinary endeavors. As such, the project aims to not just bring out or confirm these connections, but understand them in the context of the emerging bio-industrial landscapes. To find the formula for the co-existence of planted forests with a sound ecological and socio-economic base for local communities is the most effective and practical approach.

What we see in the transformation of Southeast Asia's high biomass societies are features common among equatorial zones across the world. Research in insular tropical Southeast Asia will serve as an important test site where such a multi-disciplinary approach may offer valuable clues. Our primary concern is the resilience of local communities that comprise people, fauna, and flora and produce strategies for responding to the emergent geo-political conditions and their ecological impacts, thereby offering alternative paths toward survival and sustainability.

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Notes

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