



Eroding battlefields: Land degradation in Java reconsidered



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ABSTRACT

Land degradation has been a major political issue in Java for decades. Its causes have generally been framed by narratives focussing on farmers' unsustainable cultivation practices. This paper causally links land degradation with struggles over natural resources in Central Java. It presents a case study that was part of a research project combining remote sensing and political ecology to explore land use/cover change and its drivers in the catchment of the Segara Anakan lagoon. Historically rooted land conflicts have turned the land into a political battlefield, with soil erosion being the direct outcome of the political struggles. Starting from an analysis of environmental changes using satellite images and historical maps, the research explored a history of violent displacements in the frame of a series of brutal insurgencies and counterinsurgencies in the 1950/60s. In these struggles over national political power, entire villages were erased, and peasants' land was appropriated by the state. This political history is 'inscribed' in today's landscape. The contested land comprises some of the most erosion-prone sites in the entire catchment of the lagoon. The landscape of erosion is a landscape of conflict and a symbol of historical violence and injustice. In line with our research in other parts of the catchment, the case study presented here challenges dominant political discourses about the nature of upland degradation in Java. It provides insight into still unresolved and underexplored chapters of Indonesian history and presents a strong plea for combining land use change science and (historical) political ecology.

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Introduction

Since Blaikie and Brookfield's calls to explore the political-economic forces that shape resource use decisions and land use patterns (Blaikie, 1985; Blaikie and Brookfield, 1987), political ecologists have greatly contributed to a better understanding of the nature of land degradation. Linking environmental conditions and changes with political, social and economic structures, power relations, and patterns of resource access and control, they have questioned partly long-standing narratives about the causes of land and other kinds of environmental degradation (see, for example, Batterbury et al., 1997; Brookfield, 1999; Forsyth, 1996; Forsyth and Walker, 2008; Ives and Messerli, 1989; Klein, 2002; Leach and Mearns, 1994; Preston et al., 1997). In many cases, they have challenged neo-Malthusian explanations, focussing on population pressure, and the one-sided blaming of farmers' cultivation practices for environmental degradation as simplistic political narratives or 'environmental orthodoxies' (Forsyth, 2003, Leach and Mearns, 1994).

In Java, one of the global hotspots of erosion and sedimentation, simplistic narratives continue to dominate societal discourses about upland degradation, river water flows and coastal sedimentation. After decades of political interventions aimed at reducing soil erosion in the island's uplands, and more than a quarter century after Blaikie and Brookfield's (1987) 'Land Degradation and Society', population densities and upland farmers' allegedly unsustainable cultivation practices (cf. Sutadipradja and Hardjowitjito, 1984) still dominate related discussions in state authorities and universities. These narratives are linked to neo-Malthusian environmental discourses and political interests. By distracting attention from exploring other causal factors of upland degradation and coastal sedimentation, i.e. by narrowing research agendas, these framings have been self-perpetuating. Also the lack of intersection between scientific communities, such as soil and land use change scientists and political ecologists, has contributed to the persistence of the misleading narratives.

In this context, research building on methods from different disciplines can be particularly fruitful. The case study presented here was part of a larger research endeavour that combined remote sensing, land use/cover mapping and historical cartography with social-scientific inquiry to explore land use and land cover changes (LUCC) and their drivers in the catchment area of the Segara Anakan lagoon, which is situated on Java's south coast. The case

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study establishes clear and direct causal links between struggles over natural resources and land degradation. It challenges established narratives about the drivers of upland degradation and makes a strong case for a historical political ecology (cf. Davis, 2009). Departing from an analysis of LUCC, the research unravelled historically rooted struggles over land that have literally turned it into a political battlefield, with soil erosion being the outcome of the political struggle. Bare, erosion prone slopes are the immediate result of ongoing struggles over land. Documenting the intricate historical roots of the land conflict, the research provides insight into local dynamics of the unresolved and little documented violent history of Indonesia in the 1950/60s. A series of insurgencies and counter-insurgencies related to the Dar'ul Islam rebellion and the anti-communist massacres during these two decades not only produced political forests cleared of people (cf. Peluso and Vandergeest, 2011, Vandergeest and Peluso, 2011), but in the long run created conflicts resulting in erosion-prone slopes cleared of trees. Following a brief review of related literature and an outline of the methodological approach used, the paper reveals the landscape of erosion as a landscape of conflict and a symbol of unresolved historical violence and injustice.

Soil erosion in Java's uplands: fragmented knowledge

Java, partly as a result of natural processes, exhibits some of the highest erosion and sediment yields worldwide (Walling and Webb, 1996) and has for decades been a hotspot of political interventions aimed at reducing soil erosion. The expansion of certain forms of agriculture has undoubtedly contributed to massively increased erosion rates in parts of the island (Dijk et al., 2004, Donner, 1987, Nibbering and Graaff, 1998, Palte, 1989, Purwanto, 1999). One of the most prominent examples is the highly profitable but ecologically destructive potato cultivation on the Dieng Plateau (cf. Lavigne and Gunnell, 2006, Rudiarto and Doppler, 2013). However, in other parts of Java, one-sided blaming of farmers' cultivation practices is not substantiated by empirical evidence. It has rather distracted attention from numerous other drivers of accelerated erosion and sedimentation (cf. Diemont et al., 1991, Schweithelm, 1989), and is partly a political strategy that has for many decades served as justification for the exclusive management of state forest territories by the state forest company and for keeping people out of these forests (cf. Galudra and Sirait, 2006, Lukas, 2013, Peluso, 1992).

The widespread neglect of contested state forest territories and of the roles of socio-political structures and processes, including questions of resource access and control, in soil and LUCC studies has contributed to the persistence of these narratives. In line with the framing of upland degradation as a result of population pressure and unsustainable farming practices, and partly embedded in related political interventions, most research on soil degradation and mitigation strategies in Java has focussed on farmers' agricultural plots (e.g. Dijk et al., 2004, Palte, 1989, Purwanto, 1999), while excluding disputed state forests from analysis (for an exception see Savitri, 2006); and LUCC studies may include demographic dynamics as explanatory variable but exclude land tenure (e.g. Verburg et al., 1999). Outstanding in terms of linking LUCC analysis and societal dynamics is the research conducted by Lavigne and Gunnell (2006), which focussed on Java's montane forests and volcanoes. But the scope of the few LUC(C)² analyses that have been conducted in the catchment area of the Segara Anakan lagoon (Astisiasari, 2008, Prasetyo, 2004), one of Java's hotspots of soil conservation efforts, was confined to remote sensing techniques

without adequate ground truthing and did not include any empirical analysis of the causes of land use and land cover patterns and changes.

Struggles over resources 'inscribed' in physical landscapes – linking land use change science and political ecology

In addition to politically confined research foci, lack of intersection between scientific communities, such as soil and LUC(C) scientists and political ecologists, may contribute to the persistence of environmental narratives (cf. Turner, 2003). Though LUC(C) science and political ecology share much common ground (Turner and Robbins, 2008) and have been fruitfully combined in other parts of the world (e.g. Elliott and Campbell, 2002, McCusker and Ramudzuli, 2007), their problem framings and analytical approaches may differ considerably (Turner and Robbins, 2008). While LUC(C) and soil science may not (sufficiently) incorporate aspects like (historical) socio-political developments (McCusker and Ramudzuli, 2007) or questions of resource access and control, political ecology may sometimes not pay much attention to LUC(C) and other bio-physical environmental conditions and dynamics (Walker, 2005, Zimmerer and Bassett, 2003). Different from LUC(C) science, which usually aims at systematically assessing area-wide LUC(C) and their immediate and (mainly theory-based) distal causes, political ecologists typically select cases "as informed by theory that stresses the role of distal or exogenous processes that usually operate to disadvantage local land managers and are often captured in social conflict and land or resource degradation" (Turner and Robbins, 2008:303).

The effects of such processes, or more broadly of any societal structures and dynamics, on physical landscapes can be seen as 'inscriptions'. Shedding light on the effects of power relations on the environment, Bryant and Bailey (1997:43) noted that the shaping of natural resource uses by powerful actors is often visibly 'inscribed' in the environment, for example, in the form of plantations or dams, while the patterns of resistance of the less powerful "are often more difficult to discern". The forms of such resistance may include 'illegal' exploitation of resources (Bryant and Bailey, 1997), which has been a widespread phenomenon in Indonesia's state forests for decades (Nibbering, 1988, Peluso, 1992); uprooting of plantation trees (see Gerber, 2010); or forest clearance in national parks (Bryant and Bailey, 1997:43). Some of the forest fires in Madagascar resulting from poorer farmers burning out of frustration about richer farmers' tree plantings which establish legal claims over land (Kull, 2002, 2004) can be seen as 'inscriptions' of struggles over resources in the physical landscape. Examples of such 'inscriptions' of resistance are also found in Peluso's (1992) in-depth study of struggles over forest land and trees in Java from colonial times until the 1980s and in Bryant's (1997) political ecology of forestry in Burma. The 'inscriptions' of struggles over resources, or more broadly of societal structures and dynamics, in physical landscapes are forming the intersection of LUC(C) science and political ecology.

Choosing an analysis of LUC(C) as the starting point of the research and then exploring the drivers of the observed changes using political ecology informed social-scientific inquiry contributes to soil and LUC(C) science by providing knowledge on and directing attention to the (often neglected) roles of socio-political structures and processes. At the same time, it integrates bio-physical conditions and dynamics into political ecology. The often limited engagement of political ecology scholarship with actual environmental conditions and dynamics has been critically noted and discussed by a number of authors (Nygren and Rikoon, 2008, Vayda and Walters, 1999, Walker, 2005, Zimmerer and Bassett, 2003). If we see, with Paulson et al. (2004:17) "[p]olitical ecology's

² The abbreviation LUC(C) refers to both land use and land cover (LUC) and land use and land cover change (LUCC).

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