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Trends in research on forestry decentralization policies

Jens Friis Lund[1,2], Rebecca Leigh Rutt[2,3] and Jesse Ribot[4]

We identify and describe four strands in the literature on forestry decentralization policies: studies that assess impacts of forestry sector decentralization policies on forests and livelihoods; studies that examine whether forestry decentralization empowers public and democratic local institutions; studies focusing on power and the role of elites in forestry decentralization, and; studies that historicize and contextualize forestry decentralization as reflective of broader societal phenomena. We argue that these strands reflect disciplinary differences in values, epistemologies, and methods preferences, and that they individually provide only partial representations of forestry decentralization policies. Accordingly, we conclude that a comprehensive understanding of these policies cannot rest solely on any of these strands, but should be informed by all of them.

Addresses
[1] Department of Food and Resource Economics, University of Copenhagen, Denmark
[2] School of Natural Resources and Environment, University of Michigan, USA
[3] School of International Development, University of East Anglia, UK
[4] Department of Geography & Geographic Information Science, University of Illinois, USA

Corresponding author: Lund, Jens Friis (jens@ifro.ku.dk)

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Introduction

Forestry sector decentralization policies are a widespread phenomenon across the Global South [1]. Officially, these policies have been driven by a belief that situating decision making closer to where forest management and use actually occurs — where its direct effects are felt most immediately — and in the hands of representative local authorities, will result in more ecologically and socially sustainable outcomes [2]. These are broadly the same official rationales underlying the support to various community-based forest management approaches.

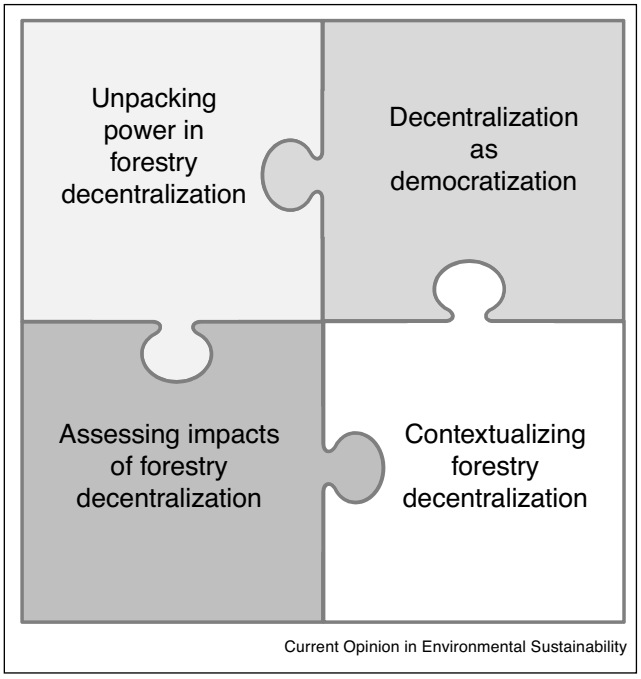
Research on forestry decentralization policies has proliferated and grown in widely different directions through contributions from different disciplines. Therefore, in this paper, we attempt a synthesis of recent contributions to this literature aiming to identify strands within it and illustrate differences, overlaps, and gaps among these. We believe this will assist scholars in situating their own work within this burgeoning literature. We also believe it is relevant to ongoing efforts at forestry decentralization as well as to more recent carbon forestry initiatives that in different ways articulate with and (re)shape existing forestry decentralization policies [3–5].

Our review focuses on research that examines forestry decentralization processes by which decision-making powers over forests are handed down, or devolved, to lower levels in a jurisdictional hierarchy of the state [6]. This implies transfers to subnational bodies, such as provinces, districts, wards, villages, or user groups. In the following we present and discuss four strands within the literature assess how decentralization impacts forests and livelihoods; studies that examine whether decentralization empowers public and democratic local institutions; studies focusing on power and elite interests in decentralization, and; studies that historicize and contextualize decentralization as reflective of broader societal phenomena. We argue that these strands reflect disciplinary differences in values, epistemologies, and methods preferences, and that they present partial representations of forestry decentralization policies (see Figure 1). Although we try to provide both depth and coverage, our review should be seen as representative of studies within the four strands we identify, and not as an attempt at fully covering the existing literature.

Assessing impacts of forestry decentralization

One strand in the literature on decentralized forestry focuses on assessing — or evaluating — the impacts of these policies on livelihoods and forests. Generally, this strand is characterized by less attention to the policy of decentralization and more to outcomes, and to establishing causality between the existence of the policy and the observed outcomes. Thus, studies within this strand tend to treat decentralized forestry policies as an 'either/or' variable, assuming the existence and, importantly, implementation of the policy in areas on the basis of information from official statistics or other secondary sources [7]. However, as demonstrated by the other strands we

Figure 1



An understanding of forestry decentralization policies should build on all the four strands identified in this review, here represented by pieces to a puzzle.

review, forestry decentralization comes in many forms and official statistics and reports are not always reflective of realities on the ground [8]. Interventions designated as decentralized forestry may, for instance, resemble highly centralized management processes [9,10] or Integrated Conservation and Development Projects [11].

This impact-oriented strand comprises a diverse set of studies in terms of research designs and methods. Generally, the substantial findings of studies within this strand illustrate that forestry decentralization is associated with lower rates of deforestation and forest degradation as compared to alternative management strategies [7,12,13•,14], while having mixed livelihood impacts with a clear tendency of adverse effects on poorer and forest-dependent households and individuals [15–17] (see also the 'Unpacking power in forestry decentralization' section).

This strand of literature usually assesses the outcomes of forestry decentralization using simple proxy indicators. For livelihood outcomes, widely used indicators include total income or forest income, which do not capture changes in livelihood risk including food security or longer-term changes in wealth or access to productive assets, for example, fertile land. For forest sustainability outcomes, examples of indicators include species richness and harvest–regrowth ratio assessed through forest inventory [18,19] and changes in crown cover assessed through remote sensing imagery [20•,21]. Such indicators are, however, ambiguous proxies for sustainability of management. One case study illustrated this by showing how local managers harvested more than the regrowth to rejuvenate an old-growth forest that, in the absence of 'overharvesting', would likely lose value due to decay and inhibit the growth of younger trees [22]. Another showed how the closing of a forest canopy was associated with a less diverse ecosystem and inequitable socio-economic outcomes [23]. Both cases illustrate an ambiguous relationship between crown cover/standing tree volume and ecological (and social and economic) sustainability. Similarly, a negative trend in species richness could be the outcome of careful forest management practices aimed at promoting valuable timber tree species. To overcome these challenges, some argue for the use of process tracing to link observed ecological outcomes to the policy through management practices [24,25].

Recent years has seen an increased emphasis within this strand on quasi-experimental research designs, statistical modes of analyses, and associated ideas of validity. These studies seek to analyze larger, and potentially more representative,[5] samples of decentralized forestry units than hitherto seen and have brought renewed attention to the issue of demonstrating causality, attribution of observed changes to a policy as opposed to other factors. Some have even argued that such quasi-experimental research designs are inherently superior in demonstrating causality [20•,26]. Yet, this notion, and the accompanying labeling of these approaches as 'evidence-based', implicitly dismisses the value, and validity, of other approaches. Rather than being merely a question of approach and design, research validity depends primarily on the rigor with which the research is carried out in practice [27]. Thus, no approach is inherently more valid than any other. Importantly, the choice of approach and design determines the type of analysis (statistical, process tracing, among others) and the forms of evidence (quantitative, qualitative) that can be analyzed. Thus, while quasi-experimental studies allow for the inclusion of larger, potentially more representative samples, they are reliant on indicators and proxies that may, or may not, be reflective of local realities [28•].

[5] On the issue of representativeness, we note that a sample — irrespective of how it is drawn (probabilistic, purposefully, conveniently, among others) — is always representative of some population. However, the inclination to see probabilistic sampling as more representative should be tempered by careful attention to the data informing the probabilistic sampling. Thus, a randomly drawn sample is representative of the sample frame (which may or may not correspond to the population of interest). Similarly, the value of the matching approaches commonly used in quasi-experimental research designs to ensure attribution depend crucially on the how well the data informing the matching correspond to local realities.

Forestry decentralization as democratization

Another strand in the literature on forestry decentralization has examined its democratic qualities and relation to projects of democracy. This research is based on theories[6] that assume 'democratic' governance — i.e. decisions made and implemented by local authorities who are accountable to the population — will result in different outcomes than centralized or individualized decision making. Hence, this research focuses on examining the kinds of bodies or actors (administrative, democratic, or private) that may receive powers (executive, legislative, or judicial) and the ways in which these bodies are held accountable (able to be sanctioned) by forestry decentralization policies [2]. The research described in this strand is primarily based on qualitative enquiry and examines global to local levels — although some studies have used multi-case comparative analyses [29].

The empirical body of work under this strand has demonstrated an extensive bypassing of local democratic institutions in favor of upwardly or narrowly accountable institutions across a host of countries [22,29–31]. These studies demonstrate that implementers of forestry decentralization reforms, such as donors, national governments, NGOs and consultancies, choose to work with project committees, non-governmental organizations, customary authorities, and forestry department appointees in the local arena. In such circumstances, decentralization policies do not result in democratic decentralization because powers are devolved to institutions that lack democratic qualities, while democratic local governments are sidelined. This happens even while democracy is touted by national forestry programs, including REDD+ [29,30].

This research has also pointed to some of the underlying reasons for this disparity between the decentralization ideal and observed practice, such as struggles over valuable forest resources [32], market access [33], donor conditionalities [34], convenience and expediency [35], ideology and beliefs about local capacity and public versus private institutions [36], and global norms of how to redress historical processes of marginalization [34]. It has also addressed the methods by which those who stand to lose from decentralization have resisted its establishment in forestry [37,38].

Unpacking power in forestry decentralization

Another strand in the literature on decentralized forestry emphasizes power relations and the role of elites at the local level. This strand seeks to unpack how forestry decentralization policies are embedded in — and become the object of — political–economic power struggles over resources.

These studies generally build on qualitative inquiry focusing on understanding local struggles [39–42], but include contributions featuring more quantitative approaches [43–45].

Studies within this strand find that forestry decentralization tends to disfavor the poorest. This is largely a consequence of three empirical regularities: (i) the poor being more forest-dependent [46]; (ii) forestry decentralization resulting in stricter rules on forest utilization and more effective rule enforcement [18,47] and; (iii) existing elites being better positioned to benefit from the socio-economic opportunities and benefits associated with forestry decentralization [43,48,49]. Finally, it is also a result of other policies — often not considered in analyses of forestry decentralization — that combine with social and technological factors to disfavor the poor [50•]. Finally, the decision-making arenas of forest decentralization policies have also been observed to fall into the hands of existing elites [35,36,41,51].

Although forestry decentralization policies are always embedded in pre-existing conditions, elite capture could arguably be said to stem from the inability of these policies, or the unwillingness of project implementing agents, to challenge pre-existing social hierarchies [52]. Related to this, studies have pointed to the tendency for such policies to be framed in ways that privilege certain people, especially elites with formal education and strong social networks [37]. Accordingly, recent contributions building on political ecology and science studies have unpacked the scientific and bureaucratic framing of decentralized forestry [53•]. These studies show that this framing tends to benefit local elites [49], while being of little use to inform actual forest management [22], and comprising a burden on understaffed and financially fraught forest bureaucracies [22,54]. These studies also explain the prominence of scientific and bureaucratic approaches to forestry with processes of institutional socialization that inhibit learning in forestry bureaucracies [55,56]. This research avenue may potentially create the impetus for forestry decentralization policies that are less prone to top-down control and elite capture. Finally, research within this strand has also examined the role of professionalized NGOs in nurturing — or not — local empowerment and responsiveness [45].

Contextualizing forestry decentralization

A final strand of research on forestry decentralization uses it as an empirical case that yields insights into broader socio-ecological/societal or more abstract phenomena such as property and citizenship [57,58], violence [59], national politics [60], technologies of government [61], development policy [62•,63], agrarian change and struggles [64,65], and neoliberalism [66–68].

[6] From neoclassical and institutional economics, new institutionalism, democracy, and governmentality.

This research contextualizes and historicizes forestry decentralization policies and thereby helps in understanding their framing and embedding in social, ecological, and economic relations, and why they are supported, contested, or abandoned altogether locally as well as nationally and internationally [54,61]. It has been particularly helpful in questioning public justifications for these policies, and illuminating what other purposes they have served, for example, recentralizing control over forest land [69–72]. Thus, research within this strand asks what forestry decentralization policies *do* — outside of and beyond their officially stated objectives. For instance, seeing forestry decentralization policy itself as a discursive resource that can be appropriated to garner material and financial resources — such as land, trees, and money — and to legitimate actors and institutions [73,74]. Further, by contextualizing — in particular historicizing — these processes, these studies illustrate how decentralization processes reflect certain moments in history, reiterating but also repackaging and adapting century old claims to empowerment and popular participation [62•,75].

Conclusion

Our review illustrates that forestry decentralization has gained the analytical attention of a variety of academic disciplines, resulting in a complex and varied body of literature. It also shows a tendency of compartmentalization, whereby the findings from one strand do not necessarily inform or draw on those of other strands. For instance, while studies have illustrated that decreasing forest cover is not necessarily an indication of unsustainable management [22], other studies use such indicators to examine relative sustainability of different management regimes. And while studies have shown that areas designated as under decentralized forestry may have highly centralized government management in practice, other studies will take such labels at face value. This is largely a consequence of different disciplinary and individual assumptions and preferences for study design and approach to data analysis that, in turn, shape empirical enquiry and, ultimately, what are presented as 'findings'. Thus, economists and political and environmental scientists favoring large-N studies and associated statistical analytical approaches face a trade-off between reducing complexity and, thereby, introducing ambiguity, and attaining the ostensibly needed number of observations. Although we believe that such endeavors may bring important and unexpected findings, we believe that they must be complemented by grounded case-based empirical studies. Likewise, we argue for continued attention among authors of such grounded empirical studies to how their idiosyncratic findings may or may not reflect more general phenomena across time and space. Thus, as this review has illustrated, the four strands present differing and partial representations of forestry decentralization policies. Accordingly, reviews that exclude large parts of the literature through restrictive inclusion criteria, such as recent systematic reviews of 'evidence-based' studies [20•,76], run the risk of reproducing and entrenching such partial representations. Rather, we argue, a comprehensive understanding of forestry decentralization policies should be informed by all of them.

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References

1. FAO: *Global Forest Resources Assessment 2015 How Are The World's Forests Changing?* 2015.

2. Agrawal A, Ribot JC: **Accountability in decentralization: a framework with South Asian and West African cases**. *J Dev Areas* 1999, **33**:473-502.

3. Khatun K, Gross-Camp N, Corbera E, Martin A, Ball S, Massao G: **When Participatory Forest Management makes money: insights from Tanzania on governance, benefit sharing, and implications for REDD+**. *Environ Plan A* 2015, **47**:2097-2112.

4. Balooni K, Lund JF: **Forest rights: the hard currency of REDD+**. *Conserv Lett* 2014, **7**:278-284.

5. Sandbrook C, Nelson F, Adams WM, Agrawal A: **Carbon, forests and the REDD paradox [Internet]**. *Oryx* 2010, **44**:330-334.

6. Mawhood P: *Local Government in the Third World*. 1983.

7. Rasolofoson RA, Ferraro PJ, Jenkins CN, Jones JPG: **Effectiveness of Community Forest Management at reducing deforestation in Madagascar**. *Biol Conserv* 2015, **184**:271-277.

8. Lund JF, Sungusia E, Mabele MB, Scheba A: **Promising change, delivering continuity: REDD+ as conservation Fad**. *World Dev* 2017, **89**:124-139.

9. Lund J, Balooni K, Casse T: **Change we can believe in? Reviewing studies on the conservation impact of popular participation in forest management**. *Conserv Soc* 2009, **7**:71.

10. Ribot J: *Waiting for Democracy: The Politics of Choice in Natural Resource Decentralization [Internet]*. 2004.

11. Mutune JM, Lund JF: **Unpacking the impacts of "participatory" forestry policies: evidence from Kenya**. *For Policy Econ* 2016, **69**:45-52.

12. Rasolofoson RA, Ferraro PJ, Ruta G, Rasamoelina MS, Randriankolona PL, Larsen HO, Jones JPG: **Impacts of community forest management on human economic well-being across Madagascar**. *Conserv Lett* 2016 http://dx.doi.org/10.1111/conl.12272.

13. • Wright GD, Andersson KP, Gibson CC, Evans TP: **Decentralization can help reduce deforestation when user groups engage with local government [Internet]**. *Proc Natl Acad Sci* 2016, **113**:14958-14963.

This examines causal mechanisms behind observed variation in how forestry decentralization policies affect forest cover and is illustrative of how carefully designed quasi-experimental studies can generate novel

insights on the relationship between governance and environmental outcomes.

14. Ellis EA, Romero Montero JA, Hernández Gómez IU: **Deforestation processes in the state of Quintana Roo, Mexico [Internet]**. *Trop Conserv Sci* 2017, **10** 194008291769725.

15. Ameha A, Nielsen OJ, Larsen HO: **Impacts of access and benefit sharing on livelihoods and forest: case of participatory forest management in Ethiopia**. *Ecol Econ* 2014, **97**:162-171.

16. Rahut DB, Ali A, Behera B: **Household participation and effects of community forest management on income and poverty levels: empirical evidence from Bhutan**. *For Policy Econ* 2015, **61**:20-29.

17. Chhatre A, Agrawal A: **Trade-offs and synergies between carbon storage and livelihood benefits from forest commons [Internet]**. *Proc Natl Acad Sci* 2009, **106**:17667-17670.

18. Persha L, Agrawal A, Chhatre A: **Social and ecological synergy: local rulemaking, forest livelihoods, and biodiversity conservation**. *Science (80-)* 2011, **331**:1606-1608.

19. Treue T, Ngaga YM, Meilby H, Lund JF, Kajembe G, Iddi S, Blomley T, Theilade I, Chamshama SAO, Skeie K *et al.*: **Does participatory forest management promote sustainable forest utilisation in Tanzania**. *Int For Rev* 2014:16.

20. • Bowler DE, Buyung-Ali LM, Healey JR, Jones JPG, Knight TM, Pullin AS: **Does community forest management provide global environmental benefits and improve local welfare?** *Front Ecol Environ* 2012, **10**:29-36.
This paper comprises a global systematic review of the literature on outcomes of community forest management. Although the selection criteria applied in the paper by default discounts much of the theoretically oriented literature and that based on qualitative modes of enquiry, the review does provide interesting observations on patterns of outcomes, as well as on challenges of attaining validity in more quantitatively oriented research designs to assess outcomes and impacts.

21. Paulson Priebe ME, Evans T, Andersson K, Castellanos E: **Decentralization, forest management, and forest conditions in Guatemala [Internet]**. *J Land Use Sci* 2015, **10**:425-441.

22. Rutt RL, Chhetri BBK, Pokharel R, Rayamajhi S, Tiwari K, Treue T: **The scientific framing of forestry decentralization in Nepal**. *For Policy Econ* 2015, **60**:50-61.

23. Kumar S: **Does "participation" in common pool resource management help the poor? A social cost–benefit analysis of joint forest management in Jharkhand, India**. *World Dev* 2002, **30**:763-782.

24. Lund JF, Burgess ND, Chamshama SAO, Dons K, Isango JA, Kajembe GC, Meilby H, Moyo F, Ngaga YM, Ngowi SE *et al.*: **Mixed method approaches to evaluate conservation impact: evidence from decentralized forest management in Tanzania**. *Environ Conserv* 2015:42.

25. Andersson K, Gibson CC: **Decentralized governance and environmental change: local institutional moderation of deforestation in Bolivia**. *J Policy Anal Manag* 2007, **26**:99-123.

26. Baylis K, Honey-Rosés J, Börner J, Corbera E, Ezzine-de-Blas D, Ferraro PJ, Lapeyre R, Persson UM, Pfaff A, Wunder S: **Mainstreaming impact evaluation in nature conservation**. *Conserv Lett* 2016, **9**:58-64.

27. Easterly W: *The Tyranny of Experts: Economists, Dictators, and the Forgotten Rights of the Poor*. 2013.

28. • Miller DC, Rana P, Wahlén CB: **A crystal ball for forests? Analyzing the social-ecological impacts of forest conservation and management over the long term**. *Environ Soc Adv Res* 2017, **8**:40-62.
This paper reviews the interdisciplinary literature assessing forest conservation and management impacts and discusses the relative merits of impacts assessments based on quasi-experimental designs and studies taking a more critical, ethnographic approach. It highlights a relative lack of attention on longer-term impacts in both of these areas of scholarship and emphasizes how complexity of social–ecological systems challenge attempts at evaluating interventions.

29. Ece M, Murombedzi J, Ribot JC: **Disempowering democracy: local representation in community and carbon forestry in Africa**. *Conserv Soc* 2017, **15**:357-370.

30. Nuesiri EO: **Decentralised forest management: towards a Utopian realism**. *Geogr J* 2016, **182**:97-103.

31. Chomba SW, Nathan I, Minang PA, Sinclair F: **Illusions of empowerment? Questioning policy and practice of community forestry in Kenya**. *Ecol Soc* 2015:20.

32. Mustalahti I, Lund JF: **Where and how can participatory forest management succeed? Learning from Tanzania, Mozambique, and Laos**. *Soc Nat Resour* 2010, **23**:31-44.

33. Ribot JC, Chhatre A, Lankina T: **Introduction: institutional choice and recognition in the formation and consolidation of local democracy**. *Conserv Soc* 2012, **6**:1-11.

34. Rutt RL, Lund JF: **What role for government? The promotion of civil society through forestry-related climate change interventions in post-conflict Nepal**. *Public Adm Dev* 2014:34.

35. Baruah M: *Effect of Institutional Choices on Representation in a Community Resource Management Area in Ghana*. 2015.

36. Faye P: **Choice and power: resistance to technical domination in Senegal's forest decentralization**. *For Policy Econ* 2015, **60**:19-26.

37. Larson AM, Ribot JC: **The poverty of forestry policy: double standards on an uneven playing field**. *Sustain Sci* 2007, **2**:189-204.

38. Poteete AR, Ribot JC: **Repertoires of domination: decentralization as process in Botswana and Senegal**. *World Dev* 2011, **39**:439-449.

39. Balooni K, Lund JF, Kumar C, Inoue M: **Curse or blessing? Local elites in Joint Forest Management in India's Shiwaliks**. *Int J Commons* 2010, **4**:707-728.

40. Nuesiri E: *Representation in REDD-NGOs and Chiefs Privileged Over Elected Local Government in Cross River State, Nigeria*. 2015.

41. Kijazi M: *Resources, Rents, Representation and Resistance The Struggle for Just Conservation on Mount Kilimanjaro*. 2015.

42. Bazaara N: *Decentralization, Politics and Environment in Uganda*. 2003.

43. Persha L, Andersson K: **Elite capture risk and mitigation in decentralized forest governance regimes**. *Glob Environ Chang* 2014, **24**:265-276.

44. Krott M, Bader A, Schusser C, Devkota R, Maryudi A, Giessen L, Aurenhammer H: **Actor-centred power: the driving force in decentralised community based forest governance**. *For Policy Econ* 2014, **49**:34-42.

45. Cook NJ, Wright GD, Andersson KP: **Local politics of forest governance: why NGO support can reduce local government responsiveness**. *World Dev* 2017, **92**:203-214.

46. Angelsen A, Jagger P, Babigumira R, Belcher B, Hogarth NJ, Bauch S, Börner J, Smith-Hall C, Wunder S: **Environmental income and rural livelihoods: a global-comparative analysis**. *World Dev* 2014, **64**:S12-S28.

47. Lund JF, Treue T: **Are we getting there? Evidence of decentralized forest management from the Tanzanian Miombo Woodlands**. *World Dev* 2008, **36**:2780-2800.

48. Wilshusen PR: **Shades of social capital: elite persistence and the everyday politics of community forestry in southeastern Mexico**. *Environ Plan A* 2009, **41**:389-406.

49. Green KE, Lund JF: **The politics of expertise in participatory forestry: a case from Tanzania**. *For Policy Econ* 2015, **60**:27-34.

50. • Ribot J: **Theorizing access: forest profits along Senegal's charcoal commodity Chain**. *Dev Change* 1998, **29**:307-341.
This article puts property (and thereby forestry decentralization policy) in its place by illustrating the many other legal and extra-legal factors that decide the ability of people to benefit from having property rights to trees.

51. Mandondo A, Jusrut P: *Waiting for Democratic Representation in Africa's Social Forests*. 2015.

52. Lund JF, Saito-Jensen M: **Revisiting the issue of elite capture of participatory initiatives**. *World Dev* 2013, **46**:104-112.

53. • Lund JF: **Paradoxes of participation: the logic of professionalization in participatory forestry**. *For Policy Econ* 2015, **60**:1-6.
This paper, and the special issue articles that it introduces, illustrate ways of challenging top-down scientific and bureaucratic framings of forestry decentralization reforms by showing how they delimit the space for participation, incur substantial costs, and have limited relevance to actual forest management practice.

54. Mathews AS: *Instituting Nature: Authority, Expertise, and Power in Mexican Forests*. MIT Press; 2011.

55. Fleischman FD: **Why do foresters plant trees? Testing theories of bureaucratic decision-making in central India**. *World Dev* 2014, **62**:62-74.

56. Ojha HR, Banjade MR, Sunam RK, Bhattarai B, Jana S, Goutam KR, Dhungana S: **Can authority change through deliberative politics? Lessons from the four decades of participatory forest policy reform in Nepal**. *For Policy Econ* 2014, **46**:1-9.

57. Byrne S, Nightingale AJ, Korf B: **Making territory: war, post-war and the entangled scales of contested forest governance in mid-Western Nepal**. *Dev Change* 2016, **47**:1269-1293.

58. Rutt RL: **Reconceptualizing the social contributions of community forestry as citizenship**. *Int For Rev* 2015, **17**:326-339.

59. Peluso NL: **Violence, decentralization, and resource access in Indonesia [Internet]**. *Peace Rev* 2007, **19**:23-32.

60. McCarthy J: **The changing regime: forest property and reformasi in Indonesia [Internet]**. *Dev Change* 2000, **31**:91-129.

61. Agrawal A: **Environmentality [Internet]**. *Curr Anthropol* 2005, **46**:161-190.

62. • Dressler W, Büscher B, Schoon M, Brockington D, Hayes T, Kull CA, Mccarthy J, Shrestha K: **From hope to crisis and back again? A critical history of the global CBNRM narrative**. *Environ Conserv* 2010, **37**:5-15.
This paper provides a theoretically well-founded and historically informed global review of CBNRM initiatives (and thereby forestry decentralization). It is a foundational piece for anyone interested in engaging with this literature.

63. Hinojosa Flores ID, Skutsch M, Mustalahti I: **Impacts of Finnish cooperation in the Mexican policy making process: from the community forest management to the liberalization of forest services**. *For Policy Econ* 2016, **73**:229-238.

64. Bray DB: **Muir and Pinchot in the Sierra Norte of Oaxaca: governance of forest management and forest recovery in Pueblos Mancomunados**. *World Dev Perspect* 2016, **4**:8-10.

65. Devine JA: **Community forest concessionaires: resisting green grabs and producing political subjects in Guatemala [Internet]**. *J Peasant Stud* 2016 http://dx.doi.org/10.1080/03066150.2016.1215305.

66. McCarthy J: **Neoliberalism and the politics of alternatives: community forestry in British Columbia and the United States**. *Ann Assoc Am Geogr* 2006, **96**:84-104.

67. Nightingale AJ: **"The experts taught us all we know": professionalisation and knowledge in Nepalese community forestry**. *Antipode* 2005, **37**:581-603.

68. Nel A: **The neoliberalisation of forestry governance, market environmentalism and re-territorialisation in Uganda [Internet]**. *Third World Q* 2015, **36**:2294-2315.

69. Sungusia E, Lund JF: **Against all policies: landscape level forest restoration in Tanzania**. *World Dev Perspect* 2016, **3**:35-37.

70. Sunam RK, Paudel NS, Paudel G: **Community forestry and the threat of recentralization in Nepal: contesting the bureaucratic hegemony in policy process [Internet]**. *Soc Nat Resour* 2013, **26**:1407-1421.

71. Ribot JC, Agrawal A, Larson AM: **Recentralizing while decentralizing: how national governments reappropriate forest resources**. *World Dev* 2006, **34**:1864-1886.

72. Sahide MAK, Supratman S, Maryudi A, Kim Y-S, Giessen L: **Decentralisation policy as recentralisation strategy: forest management units and community forestry in Indonesia [Internet]**. *Int For Rev* 2016, **18**:78-95.

73. Koch S: **International influence on forest governance in Tanzania: analysing the role of aid experts in the REDD+ process**. *For Policy Econ* 2016 http://dx.doi.org/10.1016/j.forpol.2016.09.018.

74. Sarker PK, Rahman MS, Giessen L: **Empowering state agencies through national and international community forestry policies in Bangladesh**. *Int For Rev* 2017, **19**:79-101.

75. Cornwall A: **Historical perspectives on participation in development [Internet]**. *Commonw Comp Polit* 2006, **44**:62-83.

76. Puri J, Nath M, Bhatia R, Glew L: **Examining the evidence base for forest conservation interventions**. *Evidence Gap Map Report 4* 2016.