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Gender in the Jungle: A critical assessment of women and gender in current (2014-2016) forestry research

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SUMMARY

Fields and forests are gendered spaces. Women's crucial contributions to productive and reproductive work within and beyond the household have been made visible since the 1970s. There has also been a persistent call for mainstreaming gender in sustainable development and environmental concerns. Prior work discusses the importance of women and gender for forests, and provides guidelines and methods to integrate them in forestry research. This paper assesses the uptake of women and gender issues in recent (2014-2016) forestry research. We found that women and gender concerns are still largely absent or inadequately addressed in forestry research published in scientific journals. Despite the call for greater gender integration in forestry, much needs to be done in quantitative and qualitative terms to meet this goal.

WORDS

women, forestry, gender, gender mainstreaming, gender relations of power

Fields and forests are gendered spaces. As in Rudyard Kipling's *Jungle Book*, women were largely absent from research on farming, animal husbandry, and forestry until the 1970s. Ester Boserup's (1970) study *Women's Role in Economic Development* played a landmark role in highlighting women's key but invisible role in agricultural production. Since then an extensive range of publications make visible women's crucial contributions to productive and reproductive

work within and beyond the household. Indeed, women's advocates, gender professionals, and feminists argue that acknowledging the key roles that women play in improving food security, family health, and forest management is crucial to achieving sustainable development (MacGregor 2017, UN Women 2014).

Sustainability and gender equality remain aspirational goals in the 21st century, and interest in women and gender issues for sustainable development is surging. For example, in the lead-up to and following the Sustainable Development Goals (SDGs),¹ a range of development institutions and policies including those concerned with natural resource management and forest governance attempted to integrate women and gender in their mandates (Catacutan and Naz 2015, FAO 2009, 2016a, 2016b, ICRAF 2014, Manfre and Rubin 2012, WOCAN 2013). Within this context this review aims to assess the uptake of women and gender issues within forestry research published in scientific journals.

We start with a brief overview of how women and gender concerns emerged in discussions about natural resource management and the environment and how gender mainstreaming (sometimes also called gender integration) appears on the agenda of international forestry institutions. Next, we summarize previous assessments of gender in forestry research. Their findings and gaps inspire our assessment of current research on gender and forestry. These prior works review case studies on roles of women in natural resource management and reiterate the benefits of including gender concerns in forestry. However, they pay little critical or analytical attention to how the categories 'women' and 'gender' are understood and analyzed within forestry research. The term gender is narrowly interpreted to mean women, or differences between women and men; research focuses on collecting sex-disaggregated data without attention to what accounts for gendered relations of power. We follow up on these prior works to review how journal articles on forestry published between 2014 and 2016 take up gender concerns. Specifically we assess how these articles engage analytically with gender, especially according to the terms they espouse in their methods. We find that despite the call for greater gender integration in forestry, much needs to be done in quantitative and qualitative terms to meet this goal.

¹ The SDGs (<https://sustainabledevelopment.un.org/sdgs>) aim to guide development policies from 2015-2030, and follow from the Millennium Development Goals (<http://www.unmillenniumproject.org/goals>), which aimed to reduce poverty by half between 2000 and 2015.

GENDER IN THE JUNGLE: WOMEN, GENDER, THE ENVIRONMENT, AND FORESTRY

Attention to women and forests appeared as part of a focus on how rural women use and manage natural resources in the developing world (Braidotti *et al.* 1994, Dankelman and Davidson 1988, UNEP 2004). As is the case now, rural women were disproportionately dependent on a wide range of natural resources—firewood for fuel, fodder, wild fruit, etc.—for their livelihoods. Attention to this dependence coincided with debates about tropical deforestation and environmental degradation. Within early environmental debates, population growth was held responsible for resource degradation and poor third-world women were characterized as “forest foes” (Arora-Jonsson 2011, Hartmann 2001, Leach 2007, Mies and Shiva 1993). Advocates of poor women, such as Vandana Shiva from India and Wangari Maathai from Kenya, interpreted this dependence differently contending that rural women were particularly knowledgeable “stewards of nature” and especially vulnerable to resource degradation (Maathai 2010, Shiva 1988). Women began to appear as stewards of nature or forest heroines in the development and environment literature, though the view of poor women as forest foes did not entirely disappear (Arora-Jonsson 2011).

On the ground, however, the realities are more complex than such binary representations indicate. Women and men play varying roles and hold diverse responsibilities in agricultural production and resource management (Agarwal 1992, 2010, Asher and Shattuck 2017, Elmhirst and Resurreccion 2008, Nightingale 2006). The analytical and empirical work on gender also reveals that there is much heterogeneity among women and that their social positions depend not just on their relations with men but are interconnected with their class, ethnicity, geographic location, and age. These studies also highlight how gender disparities are pervasive and point out that women and marginalized groups “are likely to bear a disproportionate share of the costs of economic, social and environmental unsustainability” (UN Women 2014: 15). Furthermore, women’s advocates, gender professionals, and feminists contend that working towards gender equality and addressing gendered power relations and inequities are crucial parts of sustainable development.

Various definitions and strategies have emerged to mainstream gender within development institutions.² The overarching definition was drafted in 1997 by ECOSOC (United Nations Economic and Social Council), the coordinating body for the social and economic policies of the United Nations:

Mainstreaming a gender perspective is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in any area and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of the policies and programmes in all political, economic and societal spheres so that women and men benefit equally, and inequality is not perpetuated. The ultimate goal is to achieve gender equality. (<http://www.ilo.org/public/english/bureau/gender/newsite2002/about/defin.htm>).

While forestry projects and research increasingly discussed gender mainstreaming in the wake of this definition, other organizations preceded ECOSOC in recognizing the need to integrate women in forestry. For example, in 1979, USAID's Women in Development Office produced "Women in forestry for local community development: a programming guide" (Hoskins 1979, 2016). The guide observed how gender dynamics impact forestry activities and presented sample management plans, including questionnaires for interviewing local officials about women's roles and relationships to forests. In the preface, Hoskins describes the guide as responding to "a growing awareness of the need for more fully including women in AID programming efforts, and program designers were asking for information on how to do this" (Hoskins 1979: i). In the nearly four decades since Hoskins wrote this guide, forestry institutions have repeatedly declared the need to more comprehensively include women and gender concerns in forestry, and asking what methodologies are most likely to achieve this. Organizations such as the Center for International Forestry Research (CIFOR), Food and Agriculture Organization (FAO), and World Agroforestry Centre (ICRAF) have published manuals and toolboxes for scientists to include gender analysis in their research, asserting that such research leads to better development outcomes.

² See Dingo (2012) for a detailed discussion of how feminist scholarship, activism and advocacy and especially the Fourth World Conference on Women held in Beijing in 1995 influenced governments and development policy to uptake gender concerns.

In 1990 the FAO Committee on Forestry included “Women and Forestry” among the six main topics addressed during its biennial meeting (FAO 1990). The Committee recommended that the FAO support women’s participation in forestry projects, and pursue stronger “gender-sensitive monitoring of its field projects.” A few years later the FAO outlined more specific steps for such monitoring in a manual titled “Integrating gender considerations into FAO forestry projects” (Rojas 1993), which stressed the need to collect sex-disaggregated data and offered guidelines for including women throughout a project’s implementation. FAO later published the even more comprehensive “Gender Analysis and Forestry Training Package”, including not only recommendations for designing projects but also training materials for workshops that would teach these gender analysis methods to researchers and officials throughout the forestry sector (Wilde and Vainio-Mattila 1995).

The Consortium of International Agricultural Research Centers (CGIAR) also reviewed its approach to gender mainstreaming in research during the 1990s and early 2000s. In 1996, the Gender and Diversity Program of the CGIAR moved gender research issues into the broader Participatory Research and Gender Analysis Program in an effort to separate gender analysis in research from diversity in hiring practices. Four years later, an external review found that the gender component was isolated within the program and hampered by unclear goals. The reviewers also observed that although researchers collected sex-disaggregated data, “in very few projects gender relations are analyzed with reference to social and political issues” (Prain *et al.* 2000: 52). In the following decade, the program assumed responsibility for supporting institutional gender strategies (CIAT 2011).

The development and refinement of gender-focused tools for forestry researchers and development professionals continues, and many guides and manuals present methods for integrating gender into forestry research and projects (Catacutan and Naz 2015, CIFOR 2013, FAO 2009, 2016a, FAO 2016b, ICRAF 2014, Manfre and Rubin 2012). Among these guides, some common themes emerge. First, the guides usually refer to ‘gender mainstreaming’ as the underlying rationale for conducting research on gender issues in forestry, and ‘gender analysis’ as the specific methods used in such research. However, there is some overlap and interweaving of these two terms. For example, consider hypothetical researchers conducting a study on gender dynamics within a forestry project. The study may assess the extent to which gender mainstreaming has been successfully applied in a forestry project. Such an assessment could be a

gender analysis. At the same time, the study may serve to further gender mainstreaming within the researchers' institution by meeting its gender policy guidelines. These manuals do not contradict the definitions they provide for 'gender mainstreaming' and 'gender analysis', but, as the example above shows, in practice there is some fluidity between these terms. Second, there is also some ambiguity among the definitions of 'gender analysis'. All the guides describe gender analysis as examining, describing, and interpreting the impacts of gender dynamics on forestry practices and development objectives. But some guides also include a description of gender analysis as action-oriented, seeking to "offer guidance on how to avoid or mitigate negative impacts" (CIFOR 2013: 4), "identify options and priorities for transforming inequality" (ICRAF 2014: ix), and assess "the capacities of service providers to address gender inequalities" (FAO 2016b: 66). Third, all the guides stress that collecting sex-disaggregated data is an essential step in conducting gender analysis. The type of data collected depends on the study's research questions, but the most commonly provided examples are household-level data that measure differences in men and women's labor, access to resources, and participation in leadership/management roles. The guides also recommend disaggregating the data by other demographic attributes (e.g., socioeconomic status, age, marital status) and ensuring that data are collected from both men and women. Fourth, the guides recommend using a mix of quantitative and qualitative methods and particularly emphasize participatory techniques. Fifth, most of the guides make reference to research that is 'gender-blind' (i.e., includes no gender analysis) and contrast this with research that is 'gender-aware' or 'gender-sensitive' (i.e., includes some level of gender analysis—standards vary among guides) and research that is 'gender-transformative' (i.e., thoroughly incorporates gender analysis and aims to reduce gender inequality). Finally, although most methodological recommendations refer to household-level data collection, stating that "gender differentiation is an inherently a local experience" (CIFOR 2013, ICRAF 2014), the guides do acknowledge that gender analysis may also examine gender issues at the community, institutional, national, or regional level.

Despite the continued publication of these handbooks, attention to women and gender concerns remains a small and marginal part of forestry research published in scientific journals. Most published research on gender and forests focuses mainly to women's roles in the social aspects and impacts of forestry, particularly community forestry. Mai *et al.* (2011) examined 121 peer-reviewed journal articles and books on women, gender and forests published from 2000 to

2011. Their assessment of the emerging priorities and ongoing concerns about gender in forestry research focused on the differences between men's and women's contributions to forestry. Reiterating the benefits of gender research for forestry, the review discussed what prevents the inclusion of gender in forestry research and offered methods for gender integration.

Colfer and Minarchek (2012) explore this topic further and suggest an array of approaches to gender analysis, differentiated according to the time, resources, and expertise available to researchers, noting that any gender analysis is better than none at all. A few other studies synthesize the content of forestry and agroforestry studies that include gender (Colfer *et al.* 2015, Kiptot and Franzel 2012). These reviews also reiterate the importance of integrating gender concerns in agroforestry research stating the benefits it has for agroforestry systems and women. Aside from these reviews, there is little work critically analyzing the uptake of gender concerns within forestry research. Indeed, as Mai and Mwangi (In prep.) note "CIFOR's research over the past 10 years was not exempt from this narrow interpretation, where gender had been equated either with a focus only on women or with the collection of sex-disaggregated data; and little effort had been made to unpack the drivers of gendered relationships."

This paper reviews research on forests and forestry published in scientific journals after these calls and the availability of gender mainstreaming guides to assess if and how such forestry research engages concerns about gender. Specifically, how often and how gender appears in forestry articles published between 2014 and 2016 were assessed. The focus was restricted to journal articles because they are concerned the gold standard of scientific research within CGIAR forestry research institutions.

METHODS

A wide net was cast in our literature searches, including the many diverse subfields of forestry (e.g., agrobiodiversity, governance, ecological economics). Two databases, EBSCO (largely social science literature) and Web of Science (largely biological science and technology literature) were queried and limited to the English language and articles published in journals of forestry, environment, agriculture, development, geography, or gender studies. Table 1 lists the search terms used. These search terms were applied to "all text" and "topic", the widest field options available. Preliminary searches returned very few books and book chapters, and those that did appear had similar content published by the authors in academic journal articles

(Chowdhury 2014, Chowdhury *et al.* 2014). For that reason and because most natural science fields value publications in scientific journals more highly than chapters in edited volumes, we focused on journal articles. Because our review comprises current forestry research (rather than the historical trajectory of gender in forestry research), articles were limited to the years 2014, 2015, and 2016.

Articles that used ‘forest’ metaphorically, articles that used ‘gender’ to refer to the sex of plants or animals, and articles that used the word ‘forest’ but did not focus on forestry or forestry-related issues were eliminated. While the judgment of what constituted forestry was ultimately subjective, the selection process erred on the side of inclusivity. This step removed many articles, resulting in a steep decline from the initial search results (1180 articles) to the final set of articles selected (104).

Each article of the final set was assessed based on the following questions:

- 1) Do issues of gender drive the research questions posed in the study? Or are gender concerns secondary or subsidiary
- 2) Does the study clearly and explicitly articulate the way in which it conceptualizes gender? If so, does the study apply this defined understanding of gender consistently to its methods and analysis?
- 3) Does the study engage with gender in terms of broad structural power relations, or does it only examine gender at the local level, particularly in terms of power relations between individual men and women?

In addition to these questions examining level of engagement with gender issues, some basic features of each study’s research methods were documented:

- 4) Does the study draw on primary or secondary data?
- 5) Does the study apply statistical analysis to its data? (Here statistical analysis refers only to tests of statistical significance. Studies that reported only summary statistics—regardless of quantitative, qualitative, or mixed methods used—were all categorized as non-statistical analysis.)
- 6) Does the study focus on a region in the global south or global north?

The purpose of questions 4-6 was to identify what trends (if any) exist between different research approaches and the type and depth of engagement with gender.

RESULTS AND FINDINGS: HOW OFTEN AND HOW DOES GENDER APPEAR IN FORESTRY RESEARCH

Presence of gender issues within forestry research

The 104 articles included in this review were published in 46 different journals. *International Forestry Review* published the greatest number of articles (19) followed by *Forest Policy & Economics*, which published ten. During the last three years (2014-2016), *International Forestry Review* published a total of 173 articles. Thus, approximately 11% of the articles published by *International Forestry Review* include gender to some degree. Notably, ten of these articles were part of a special issue on gender (*Special Issue: Gender in Agroforestry*, Sep. 2015). When this special issue is excluded, articles including gender account for about 6% of articles published by *IFR*. For comparison, the ten *Forest Policy & Economics* articles in this review represent about 3% of those published by the journal. These estimates are limited by the databases used. Nevertheless, these estimates give a rough picture of the frequency of gender's appearance in forestry literature.

Depth of engagement with gender

Of the 104 articles reviewed, 34 had research questions that focused on gender, 61 applied gender as a secondary level of analysis, and 9 did not include any substantial gender analysis. That is, gender is central to the investigation in about one-third of the articles. Examples of gender-driven research include examinations of the role of women's networks in the male-dominated Swedish forestry industry (Andersson and Lidestav 2016), the impact of climate change on gender roles in community forestry in Vietnam (Pham, P. *et al.* 2016), and gender equity in carbon-market projects in Kenya (Lee *et al.* 2015).

In contrast, a majority of the articles included gender analysis in a supporting role. That is, they provided some assessment of how gender relates to their primary research questions but focused on other topics. For example, Galloway *et al.* (2016) studied the potential for commercializing the harvest of perfume plants from forests in Namibia, and found that, among other social impacts, this economic activity may increase women's decision-making power. In a study of Americans' perceptions of public forests, women were more likely to express lower levels of understanding of forest conditions (Hartter *et al.* 2015). And a case study of a "payments for ecosystem services" (PES) program in Mozambique found that gender, among

other socio-demographic variables, explained differences in participation rates (Mudaca *et al.* 2015).

Finally, nine articles appeared in our literature search because they mentioned women or gender but not in a manner that had any bearing on their overall analysis. For example, five articles used sex-disaggregated data only to describe the demographics of their sample and did not analyze the relationships between gender and other variables. Also some health and fertility research used women subjects but did not explore how these women's gender impacted the results. Other research made brief, broad observations about women, which were not derived from their own data.

Conceptualizations of gender

Gender was conceptualized in broad and different ways in the 104 articles reviewed. The majority of the articles (65) did not define gender explicitly. Rather the authors moved directly to discussing differences between women and men in their results. That is, the studies implicitly assumed that gender referred to men and women within a particular local context.

The remaining 39 articles articulated their reasons for examining gender in the background and rationale for their research. They specified the existing gender-related scholarship they built upon and/or described how they understood gender to be relevant to and within a particular context. Most (33) of these 39 articles also had research questions that focused primarily on gender. The remaining six articles defined gender even though gender analysis was a secondary goal of their research (compared to 55 secondary-gender-analysis articles that did not define it). The nine articles with no gender analysis did not define their understanding of gender either.

Among the 39 articles that did explain what they meant by gender, five articles had discrepancies between their definition (as described in the article's introduction) and their practice (as applied in their methods). For example, Pham, P. *et al* (2016) note that overemphasizing the importance of power relations between individual women and men to can obscure larger underlying social structures. Yet, their own study focuses on local individuals. Two studies noted the importance of intersectionality in gender analysis but did not apply this principle to their methods (Bose 2015, Larson *et al.* 2015). Kiptot (2015) observes that gender dynamics are complex, context-specific, and change over time before making broad

generalizations about differences about between women and men in African agroforestry. McCall *et al.* (2016) initially stress the importance of including gendered knowledge in measuring forest carbon, but later hedge this stipulation, wishing to avoid disturbing social norms. Adherence alone does not indicate whether a particular conceptualization of gender is nuanced or simplistic. Therefore discrepancies identified in these five articles do not necessarily suggest methodological shortcomings, but do exemplify the types of gaps that exist between gender in theoretical discourses and gender in research practice.

The other 34 articles with an explicit conceptualization of gender appeared to apply their definition consistently in their methods. However, the nature of these definitions varied widely. For example, for Coutinho-Sledge (2015) gender analysis means not only examining women and men but also “normatively feminine values” and organizational culture and change. Khadka *et al.* (2014: 199) give a direct definition of gender relations, stating that they “refer to power differentials, especially between men and women, in a particular context, over time”. They also stress that gender analysis must consider “existing gendered structural barriers” and “a broader sociopolitical perspective” (199). Gelinias *et al.* (2015) cite gender mainstreaming in framing their research, specifically the ‘gender box’ framework (Colfer and Minarchek 2012), and distinguish between gender approaches that focus on equality versus those that focus exclusively on women. Mbosso *et al.* (2015) mostly discuss the ways in which responsibilities in food production are often gendered, noting that these roles can change over time. Mulyoutami *et al.* (2015) similarly consider how gender roles impact tree species domestication, as well as gendered differences in access to and control over natural resources. The point here is that each of these 34 articles engaged with gender in a slightly different manner, varying in their scope, framing, and focus.

While no two articles took the same approach to gender, we were able to characterize each article as either focusing their analysis at the local level relationships between individual men and women, or considering these relationships within the context of other broader power relations. The vast majority (90 articles) fell into the former category and 14 into the latter. Among these 14, three studies examine the masculine culture of forestry institutions in the North (Andersson & Lidestav 2016, Coutinho-Sledge 2015, Reed *et al.* 2014). Kern *et al.* (2015), Agarwal (2015), and Pham, T *et al.* (2016) all grapple with the relationship between women’s representation, institutional change, and governance. Four articles argue that in order to be

successful environmental conservation programs such as REDD+ [Reduction in Emissions from Deforestation and Land Degradation+] must consider gendered power structures, particularly related to resource access and governance (Khadka *et al.* 2014, Stiem and Krause, 2016, Westholm, 2016). In their investigation of gendered adaptation to climate change, Bhattarai *et al.* (2015) similarly urge researchers to critically analyze community and national power relations and also call attention to the gendered knowledge and power of international development organizations.

The complexity of gendered power dynamics between individuals, communities, and state governance is also a recurring theme in two studies of ethnic minority groups resisting state control over natural resources (Dey *et al.*, 2014; Kusakabe *et al.*, 2015). All of these articles have research questions that focus on gender, but there was one outlier in this group. Leipold (2014) presents a literature view of forest-related discourses. Although the review considers the gender of the authors and notes when papers focus on questions of gender, these points are secondary to the overall assessment of forestry discourses. However, the concluding arguments advise greater questioning of the underlying political dynamics that shape understandings of forest governance (the very type of investigation pursued by the thirteen aforementioned articles).

Methodological characteristics of research on gender and forests:

The vast majority of the articles (90) drew on primary data. Slightly more than half of all articles statistically analyzed their data. However, statistical analysis was more prevalent in studies where gender analysis was secondary (67%) than in studies with gender-focused research questions (32%). Most articles (85) conducted research in countries in the Global South; this held true across all levels of gender analysis. Finally, a quarter of all articles discussed community forestry, a proportion also maintained across all levels of gender analysis (see Table 1).

DISCUSSION: CRITICALLY ASSESSING GENDER MAINSTREAMING IN FORESTRY

As we discuss above, 104 articles published between 2014 and 2016 focused in varying ways on women and gender in forestry. With 11% as the highest proportion of articles on gender appearing in *International Forestry Review*, there is a marginal level of uptake of gender mainstreaming in forestry. The average figure across all forestry journals is likely lower than

this, as all other journals in this review each published ten or fewer articles that include gender and published more than 100 articles overall from 2014 to 2016. This average percentage would be lowered further when including all the forestry journals that did not appear in our review (because they published zero articles including ‘gender’ or ‘women’).

There is no definitive threshold number that indicates when gender has been fully mainstreamed into forestry research or that signals a discipline has developed a rigorous discourse on gender issues. And we do not presume to suggest such a benchmark. However, we do argue that these numbers provide some indication of the uptake of gender mainstreaming in forestry, or lack thereof.

In terms of how gender is understood in the articles we reviewed we found that most of the 104 articles (90) focused on gender relations at the local level and implicitly assumed these relations to mean the dynamics between individual men and women. They collected or reviewed data disaggregated by sex, and drew conclusions based on the differences between women and men’s responses. These studies can give a partial view of the impacts of gender dynamics in a given context. However, they are limited by their definition of gender dynamics as being only the social differences and power dynamics between women and men. They observe a fraction of the *effects* of gender dynamics (e.g., women’s limited access to land) without engaging with the broader structural *causes* (e.g., the roles of political and economic institutions in perpetuating social norms). In addition, most of these articles did not define their understanding of gender. When researchers reflect on how their own conceptualization of gender frames their research, it can reveal other ways in which gender norms are reinforced. For example, only three studies in this review (Andersson and Lidestav 2016, Bhattarai *et al.* 2015, Westholm 2016) do not assume gender identity is binary and gender relations are heterosexual.

In our results, the most common way in which gender appeared in forestry research was in statistical analysis of sex-disaggregated data. In these studies, researchers asked how gender influenced their results but merely as one dimension of an overarching research question. If this framework of analysis is the most prevalent in research on gender and forestry, it may be possible to conclude that this method represents the most common interpretation of gender mainstreaming in forestry. According to CIFOR’s guide to integrating gender into forestry research (Manfre and Rubin 2012: 48–49), research projects fall along a continuum from gender blind to gender aware to gender transformative. On this spectrum, gender-blind studies fail to

acknowledge gender issues, gender-aware studies at least include sex-disaggregated data (but not necessarily any deeper analysis), and gender-transformative studies have a research design informed by gender issues and seek “to transform the relationships between men and women that produce inequalities”. The guide goes on to state, “Not all research, however, will adopt a gender transformative approach. It may not be relevant or appropriate.” Gender integration is thus defined as designing research that is at least gender aware. At the same time, the guide encourages researchers to “strive to move your research along the continuum” (48–49).

Assessed in terms of Manfre & Rubin’s handbook, this review shows that many more forestry articles are gender aware than gender transformative. Why might this be the case? One possibility is that gender aware is a stepping stone to gender transformative and that the prevalence of studies that use simple gender analysis tools indicates a gradual shift toward more transformative approaches (sliding along the continuum, as the CIFOR guide suggests). This theory would perhaps be convincing if there were evidence that researchers follow-up on sex-disaggregated statistics with studies that expose the underlying social dynamics that create sex-based differences. Another possibility is that there are simply more instances in which sex-disaggregated data provide all the information relevant to a study, and no further investigation of gender is required. However, among all the articles in this review, only four (out of 32) found no statistically significant differences between men and women. This suggests that underlying gender dynamics impact forestry topics frequently enough to warrant closer analysis.

A more plausible explanation is that the prevalence of simplistic gender analysis reflects a discursive environment that does not actively encourage research that probes the causes and consequences of gendered social norms. If any level of gender awareness meets the minimum requirements to have gender as a cross-cutting theme, then gender-disaggregated data become an end-point rather than a springboard for deeper, more nuanced analyses of social dynamics and power relations. In other words, compelling discussions about social dynamics and gender inequalities are more likely to thrive in academic environments that encourage critical questioning of social institutions. In spite of the discipline’s apparent disinterest, some forestry researchers pursued studies driven by questions of gender. By examining these articles, we can begin to see the potential for more forestry research to move beyond just sex-disaggregated statistics.

The field of forestry research need not invent new methodologies and terminologies for discussing gender dynamics; such tools already exist in feminist scholarship (and indeed in the gender manuals and methodologies drafted by the gender experts hired by forestry institutions). Applying feminist research methods and theories to forestry topics is a logical—though seldom tread—path for integrating gender. Dey *et al.* (2015) bring a feminist political ecology lens to struggles over forest resources in Bangladesh. Bhattarai *et al.* (2015) also employ feminist political ecology in their exploration of the interactions between gender, socio-economic changes, and climate change adaptation in Nepal. Other articles do not explicitly use a feminist framework but draw upon lessons from feminist scholarship. For example, Kusakabe *et al.* (2015) draw upon feminist migration literature to understand how migration in Laos affects women’s mobility and use of forest products. Raising concerns similar to this review, Reed *et al.* (2014) voice concern over the lack of dialogue between feminist research and climate change research and map ways in which gender sensitivity could strengthen Canadian forest-based communities’ adaptation to climate change. A few articles examined women’s representation in institutions, a topic commonplace in feminist literature. These studies show that gender gaps vary in different forestry institutions (Coutinho-Sledge 2015, Kern *et al.* 2015), and argue opposing viewpoints on representation—its insufficiency for changing gender dynamics (Coutinho-Sledge 2015) and its power to change gender dynamics (Agarwal 2015).

Many articles in this category did not explicitly engage with feminist research but still questioned the underlying social dynamics causing differences between women and men. (Kiptot 2015, Sunderland *et al.* 2014). All of the aforementioned gender-transformative studies do not apply statistical analyses to their data. However, critical gender analysis and sex-disaggregated statistics are by no means mutually exclusive (Blare and Useche 2015, Bourne *et al.* 2015).

We distinguished articles focused on community forestry from all other sub-disciplines of forestry because we suspected that gender analysis would be more frequent and/or more nuanced in this subject. This hypothesis was not borne out by the literature review results; community forestry articles appear with approximately the same frequency among ‘gender-transformative’ studies as less critical gender and forestry research. However, we do not argue that no connection exists between community forestry and gender analysis; rather, this study simply fails to show a relationship. A previous review of gender in forestry literature (Mai *et al.* 2011) found that gender-focused studies were concentrated in community forestry, particularly in South Asia

(where much of the community forestry literature originated). Presuming that our review results are not anomalous to 2014-2016, this change could signal a shift in social forestry research—that it is increasingly branching out into other topics and is no longer dominated by research on community forestry and South Asia.

CONCLUSIONS

Critiques of gender mainstreaming and its efficacy have existed, particularly in international development literature, for over a decade (Moser 2005; Rao and Kelleher, 2005; Walby 2005). The aim of this review is not to add to this chorus, or to pose existential questions of the purpose of gender mainstreaming in research institutions. Rather, we consider the goals of gender mainstreaming as defined by forestry research institutions, and ask whether these goals have been realized. We have argued that gender integration has not been achieved by simple quantitative measures.

Assessing how gender mainstreaming is currently manifesting itself in forestry research by closely examining the content of the studies that do engage gender, we find they tend to focus on it rather narrowly. That is, beyond reference to the critical insights of prior analytical and empirical work on gender, few articles engage with these insights in their own methods or analysis. This review found that a minority of articles (14) were attentive to power relations or structural factors of gender dynamics in forestry.

We are not suggesting that gender theory needs to appear in every forestry study. However, gender mainstreaming as most commonly defined is as a process of assessing *all* policies/actions/research from a gender perspective, so we might expect it to appear more. And where it does take place, an opportunity to learn from feminist scholarship and gain a more complete and nuanced understanding of interactions between gender and forests is missed. We concur with critical gender scholars that in order for forestry research to meet the goals of gender mainstreaming, it must expand to include greater consideration of these underlying social structures.

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TABLE 1 *Breakdown of the 104 papers reviewed, arrayed according to level of gender analysis*

	Gender-focused research question (34 of 104)	Gender is part of secondary analysis (61 of 104)	No substantial gender analysis (9 of 104)
Gender is defined (34 total)	29	5	0
Gender is defined, but concepts are not applied to analysis (5 total)	4	1	0
Gender is not defined (65 total)	1	55	9
Addresses broad structural power relations (14 total)	13	1	0
Only examines local level gender dynamics between men & women (90 total)	21	60	9
Primary data (90 total)	27	54	9
Secondary data (14 total)	7	7	0
Community forestry (26 total)	9	15	2
Not community forestry (78 total)	25	46	7
Global South (85 total)	29	51	5
Global North (18 total)	5	9	4
Global (1 total)	0	1	0
Statistical analysis (58 total)	11	41	6
No statistical analysis (46 total)	23	20	3

Search terms:

(forest AND gender) OR (forest* AND women) OR (“community forestry” AND gender) OR (“community forestry” AND women)*

These terms were searched in the most inclusive field available, namely All Text (EBSCO) and Topic (Web of Science)