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⁴ Tragically, Paula died before this article was completed but we retain her authorship here as a mark of her very significant contribution to its ideas. Paula initiated this collaborative paper whilst at WorldFish, Penang, and continued her involvement with it at CIMMYT.

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Bringing Gender Analysis and Resilience Analysis Together in Small Scale Fisheries Research: Challenges and Opportunities

Nozomi Kawarazuka, Catherine Locke, Cynthia McDougall, Paula Kantor, and Miranda Morgan

Abstract: The widely-accepted policy imperative to enhance gender equity means that the demand for gender analysis is now increasingly orthodox in natural resource programming, including that for small-scale fisheries. Whilst the analysis of social-ecological resilience has made valuable contributions to integrating social dimensions into research and policy-making on natural resource management, it has so far demonstrated limited success in effectively integrating considerations of gender equity. This paper reviews the challenges in and opportunities for bringing a gender analysis together with an analysis of social-ecological resilience in the context of policy-orientated small-scale fisheries research. We argue that gender analysis and the analysis of social-ecological resilience have divergent epistemological and methodological underpinnings and we show how these have shaped the progress in social-ecological resilience analysis in addressing gender, as well as the progress of gender analysis in addressing social-ecological resilience. We conclude that rather than searching for a single unifying framework for gender and resilience analysis, it will be more effective to pursue a plural solution in which closer engagement is fostered between gender analysis and resilience analysis whilst preserving the strengths of each approach. We argue that, alongside the ongoing work of better integrating intersectional gender-disaggregated data into analysis of social-ecological resilience, that developing theoretically and methodologically rigorous gender analysis about small scale fisheries and aquaculture in specific empirical contexts is an important component for brokering closer inter-disciplinarity. Accordingly, we elaborate three core principles and three practical starting points for doing this. Fostering constructive debate between analyses of gender and social-ecological resilience has the potential to generate a richer understanding of the ways in which gendered power relations mediate social-ecological resilience.

Key words: gender, social-ecological resilience, fisheries, inter-disciplinarity.

1. Introduction

The purpose of this paper is to analyse the challenges involved in bringing gender analysis together with the analysis of social-ecological resilience and in doing so to provide ways forward that will enable a more meaningful account of gendered social relations in relation to resilience. The co-authors comprise researchers working in the field of gender as well as those working in the field of resilience reflecting our aim to promote constructive collaboration between the fields. The paper is based primarily upon a review of literature which focused closely on studies attending to both gender and fisheries, but which also included other gender studies concerned with other ecological systems, natural resource management, adaptation and climate change where they appeared pertinent. We also draw on our experience of working together to build capacity in gender research within World Fish and the Aquatic Agricultural Systems Research program of the CGIAR since 2013.

Whilst there are a plethora of terms and approaches connected with social-ecological resilience, we focus here on a range of approaches to research that are based on the same set of fundamental concerns and logics about the capacity of inter-linked social and environmental systems to adapt to environmental or climate changes at various levels. We refer to these system-orientated perspectives hereafter as 'resilience analysis'¹. Our focus on gender analysis is strongly embedded within critical social theory. Whilst gender relations and social relations are critically interlinked, we foreground gender analysis and would argue that theorising gender from a social relational perspective effectively illuminates a social analysis (see Carr and Thompson, 2014), whilst the reverse does not necessarily hold. We acknowledge that

¹ We should clarify from the outset that we are not talking here about 'social resilience'. Although this term is increasingly used, it is distinct from social-ecological resilience. Social resilience has a different archaeology, deriving from psychology, it is usually employed solely to relate to social dimensions at the level of the individual, household or community, without consideration of impacts on ecological or natural resource systems (for further commentary on social resilience see Ross et al., 2010 and Marshall et al., 2007).

the challenges and opportunities identified are not necessarily exclusive to gender analysis but are often central to doing ‘good’ qualitative social science.

We begin in section 2 by introducing the analysis of social-ecological resilience and examine its attention to date to gender. In section 3, we outline the fundamental epistemological and methodological differences in the basis for gender analysis as compared to resilience analysis and argue that these present challenges for bringing them together. We proceed in section 4 to look, firstly, at how gender has been integrated into resilience analysis in practice, with particular attention to small-scale fisheries and, secondly, to review what gender analysis has had to say about social-ecological resilience, again with attention to small-scale fisheries. In section 5, we suggest that the way forward lies in a closer engagement between plural analyses of gender and resilience. We support the ongoing inclusion of gender disaggregated variables into resilience analysis, but propose that this is a necessary but not sufficient condition for better interdisciplinary engagement². Rather, we argue that for gender analysis to effectively enrich resilience research – and vice versa – a more constructive interdisciplinary conversation needs to be premised on a theoretically and methodologically rigorous gender analysis of small scale fisheries. We identify three core principles for such an analysis and illustrate their importance for understanding social-ecological resilience in small scale fisheries. In section 6 we identify three practical starting points for interdisciplinary research around gender and resilience, before concluding that fostering a richer conversation between gender research and resilience research has the potential to contribute significantly to our understanding of small-scale fisheries.

² Both gender analysis and resilience analysis are inherently transdisciplinary approaches – in that they combine insights from a number of separate (but allied) disciplines into a unitary knowledge framework. This paper is not proposing a further transdisciplinary approach of ‘gender and resilience analysis’ but a closer inter-disciplinary conversation between gender analysis and resilience analysis.

2: The Analysis of Socio-Ecological Resilience

Socio-ecological resilience is the capacity for inter-related ecological and sociological systems to absorb or adapt to shocks or stressors, particularly those arising from climate change, without changing state (Holling 1973, Gunderson & Holling 2002, Walker et al. 2004). The term, resilience has increasingly been used in fisheries and aquaculture development (e.g. Berkes, 2003; Allison et al., 2011; Ratner and Allison, 2012; Kittinger et al., 2013). The concept was initially developed from resilience thinking that originated from the field of ecology. The recognition that ecosystems are complex, uncertain and dynamic (Holling, 1973) changed the objective of ecosystem management from stability to building ecological resilience in order to deal with uncertainty and to adapt to changes. Human activities (e.g. fishing and aquaculture) were considered to be significant elements that affect ecological resilience, and therefore understanding social contexts became increasingly important for maintaining ecological resilience. In the late 1990s, the importance of understanding the interdependent relationships between ecological systems and social systems was accepted and the idea of social-ecological resilience was developed in order to strengthen our understandings of sustainable natural resource use (Berkes and Folke, 1998; Walker et al., 2002; Hughes et al., 2005).

Social-ecological resilience thinking is a form of 'systems thinking' (Walker and Salt, 2006:11). It considers ecological systems and social systems as integrated analytical units, referred to as coupled social and ecological systems (SESs) (Berkes, 1996; Gallopin 2006; Ostrom, 2009). It considers that human actions influence and are influenced by ecological systems, moving forward from looking narrowly at ecological production systems to greater recognition of the need to support local management institutions and local resource users to adapt to changes. This paradigm shift is believed to help find context-specific policy options for establishing flexible

resource management approaches as alternatives to a universal management policy (Hughes et al., 2005; Berkes, 2010). In fishery/aquaculture interventions in developing countries this idea is useful as policies need to consider a wide range of consequences of interventions on the poor who depend heavily on natural resources.

In the 2000s, resilience thinking evolved from a focus on adaptability to also encompassing transformability (Walker et al., 2004; Folke et al., 2010). Transformability refers to 'the capacity to create a fundamentally new system when ecological, economic or social (including political) conditions make the existing system untenable' (Walker et al., 2004:3). This broader conceptualization has increased the dynamic nature of resilience thinking in terms of the degree of change and kinds of outcomes: transformation includes radical actions for future social-ecological well-being from a longer term perspective (Keck and Sakdapolrak, 2013:9). This dynamic vision of resilience fits well with the aims of development policies and practices seeking to build strong institutions and communities for the future security and well-being of the poor (Béné et al., 2014). Whilst resilience thinking has increasingly been used in this broader sense, resilience researchers point out that efforts to bring together social and ecological analysis are very much in their infancy (Folke, 2006:264) and a number of clear challenges have emerged (Stone-Jovicich, 2015).

At the root of these limitations is that processes of social change or transformation are essentially different from those of ecological systems. In particular, this has manifested itself in challenges for resilience analysis in engaging with the inherent, complex, and sometimes conflicting power relationships that exist in society. This includes challenges in analysing and addressing the ways in which different groups of resource users are affected by shocks and adapt to change differently, and how individual agency and power relations mediate stasis or changes in the systems (e.g. Davidson, 2010; Duit et al., 2010; Davoudi, 2012). Recognising this, some critical social

researchers have sought to develop the potential of resilience analysis as a malleable cross-disciplinary approach (see Brown, 2014), to positively address its capacity to analyse social dynamics (see Table 1).

Table 1: Variants of resilience analysis addressing social dynamics³

Approaches	Key papers	A unit of analysis	Objectives	Analysis of agency	The focus of analysis for understanding power	Understandings of Social change
+ Wellbeing	Brown and Westaway 2011; Coulthard et al. 2011; Armitage et al. 2012	Individual	Identifying subjective factors that shape people's adaptive strategies.	Yes	Intra-personal trade-offs	Mediated by individuals' perceptions of well-being
+ Psychology & Mental health	Berkes and Ross 2013	Community	Identifying subjective factors associated with community resilience.	Yes	No	Mediated by personal, cognitive and spiritual factors and personal goals
+Transition theory	Kemp et al. 2007; Jerneck and Olsson 2008; Bush and Marschke 2014	Community State Worldwide	Understanding the impact of technological change on the society and environment.	Yes	Macro level	Mediated by socio-economic conditions, conflict of interest at multi levels
+ Political ecology	Beymer-farris et al. 2012; Turner 2014; Nayak et al. 2014	Social group	Understanding unequal distribution of costs and benefits in environmental change	Yes	Among different social groups	Mediated by social power
+ Network theory	Janssen et al. 2006	Community	Identifying social-ecological network sand their effects on resilience	No	No	Mediated by social networks

³ This table focuses only on attempts to *theorise* resilience analysis more broadly.

While eclectic in origin, these have all included attention to social relations, either implicitly or explicitly. However, none of the approaches to resilience analysis listed in table 1 include specific attention to gender. As a result, there is still a need for further theoretical and methodological guidance for policy-orientated research institutions who are responding to the growing imperative from policy-makers to address gender equity in resilience research.

3: Why is bringing gender analysis together with resilience analysis so challenging?

Gender analysis and resilience analysis are rooted in fundamentally different epistemologies and methodologies. These differences in how they understand the world, and how they approach finding out about it, present challenges for bringing them together. We review these here with an attempt to offer an even-handed account that seeks *not* to privilege one kind of analysis over another kind of analysis. Given the inevitable political content of all theory, this is difficult, not least as, on one hand, the critique of ecological thinking from gender analysis is relatively well articulated (Stone-Jovicich, 2015) , whilst, on the other hand, the critique of gender thinking from resilience analysis is somewhat muted. We do not seek to review these politics but instead focus on elucidating the underlying differences, in order to then identify the challenges of and strategies for bringing these fields of analysis together. Whilst there is a wide range of practice within both gender analysis and resilience analysis, this section necessarily addresses mainstream and orthodox interpretations of both fields in order to illustrate their different central tendencies. This is not to deny the existence of some research that has been more successful in 'closing' what can be seen as epistemological and methodological gaps between them.

Gender analysis grew out of feminism and is a form of critical intellectual practice within the social sciences. Its central focus is on analysing inequalities in gender relations, their causes, consequences and processes of these change. Its aims vary but commonly include generating recommendations for gender sensitivity or gender equity in policy design and/or raising political consciousness of gender amongst the general public, researchers, policy-makers and participants. It is also orientated towards a more rigorous intellectual analysis of society and social change. Resilience analysis grew out of ecology and is a field of transdisciplinary practice which now spans the boundary of environmental and social science. Its aims are also varied but commonly range from pragmatic problem-solving and developing operational understandings about how to build resilience through policy design and policy processes orientated towards managing natural resources, to developing rigorous knowledge around how the resilience of different social-ecological systems and their components are impacted by climate change and different institutional arrangements for managing natural resources. So, although both gender analysis and resilience analysis are essentially concerned with understanding change in various forms, they have different understandings about how change happens and how we can understand change. Below we briefly summarise the different flavour of the epistemological foundations and methodological tendencies of their respective approaches to change.

Gender analysis is rooted in critical social theorising that sees change as a complex and unequal process in which an individual's everyday negotiations are structured by, and in turn (re)structure, wider institutions and social structures (Connell, 2009). However the evolution of gender analysis has seen a journey. Initially the focus was on conflict and measuring gaps in income, resources and decision-making between men and women, informing what can be understood as a zero-sum universalistic approach to equity and empowerment. However, the last 20 years have seen a much stronger engagement with: the duality of conflict in overall contexts of cooperation (at

different institutional levels); a focus on relations and intersectionality in terms of how gender cross-cuts and interacts with other forms of difference and identity; and a concern with meaning, discursive norms, and experience. Contemporary gender analysis offers a more complex approach to equity and empowerment that accords space to ambiguity and self-valuation of different outcomes.

Methodologically gender analysis is strongly pluralistic and crucially is theoretically informed by gender and social theory as presented above. Despite this pluralism, gender analysis methodology can be broadly said to be feminist, critically reflexive, context-specific, and interpretive. These characteristics mean that it values commentary about the extent, causes and remedies for gender (in)justice and the way power in the research process structures findings. As such, it values in-depth, complex and nuanced accounts for their authenticity. As such many gender analysis methodologies are strongly informed by ethnography and political science. Data is seen as contingent rather than 'factual': the 'same' reality can only be properly understood by exploring different interpretations. The job, if you like, of rigorous gender analysis is to make these different interpretations visible and to understand how and why they arise, rather than to eliminate or reconcile them.

Nevertheless, much gender analysis in policy-orientated settings has adopted 'off-the-peg' frameworks that have been widely promulgated by attempts to mainstream gender. These have had strong take-up but often in a check-list way that forecloses both critical theoretical engagement and offers little direction to interpretation of what the resulting inventories of gender gaps actually mean (either analytically or for policy or advocacy) (Locke and Okali, 1999). Despite the relatively strong consensus about what counts as good and rigorous gender analysis⁴, there is a widely acknowledged problem with the quality and rigor of much gender analysis: this is often

⁴ It is important to realise that this does not infer one way is the right way, there are many different ways in which these criteria can be validly met.

understandably the case where those with little or no training in gender or social theory are under pressure to deliver it⁵. The undeniable tension between the imperative towards bringing gender analysis into play in other fields, and the reality of the skills and expertise needed to ensure that gender analysis is epistemologically and methodologically robust, is familiar to most efforts at inter-disciplinarity.

Resilience analysis emerges from roots in complex adaptive systems, which frames change as occurring in and in relation to integrated social ecological systems. These systems are perceived as dynamic and self-organizing in nature, meaning that change emerges from interactions amongst parts and subsystems, rather than through central controls (e.g. Gunderson and Holling, 2002). Change is framed in relation to interactions of actors (with varying capacities for adaptation) with institutional subsystems (such as policies and rules) and ecological subsystems. Reflecting the focus of complex adaptive systems thinking on multiple and intersecting scales, a key analytical concern is the capacities of actors, communities and larger systems (such as aquatic agricultural systems) to absorb stressors or shocks (such as changes in flooding) without collapse (such as of the ability to continue to produce sufficient food and generate income). The particular outcomes of change, and their implications for future resilience, depends at different levels upon responses, feedbacks and inter-relations within and across different structures and between different scales (Walker and Salt, 2006). As such, resilience thinking enables researchers, as well as policymakers and practitioners to consider various non-technological and non-environmental factors within natural resource management and sustainable development research, policy and practice. Building on this transdisciplinary basis, resilience analysis has frequently engaged with the social aspects of change through theorising about collective action and the management of common pool resources.

⁵ This poverty of practice is in no small measure a by-product of the 'success' of gender analysis' consciousness raising evangelism (see Moser and Moser 2005).

These approaches have been underlain by a methodology that uses modelling for theory-building with a particular orientation towards understanding what works in helping social-ecological systems manage stresses and shocks effectively. “The resilience perspective evolved out of observation, using models as a tool for understanding and for incorporating groups in adaptive management and learning of ecosystem processes” (Folke, 2006:263). Social or institutional variables were typically developed and refined or discarded in so far as they proved significant in these modelling approaches. Researchers interested in “how individuals, communities and societies adapt, transform and potentially become stronger when faced with environmental, social, economic or political changes” (Ross et al., 2010:2) privileged a focus on promising social resilience characteristics for ecological resilience, such as strong people-place connections, dense social capital, or a diverse and innovative economy. The methodological emphasis is expressed clearly in the central objective driving these kinds of studies: namely, determining “how can the resilience of coupled socio-ecological systems be enhanced by different human institutions and management systems” (Langridge et al., 2006:18). This emphasis encourages an underlying tendency to assume that resilience is a desirable characteristic. This generated a pragmatic approach to the social, in which the rich tradition of critical social theory has so far received little consideration.

In conclusion, then the mainstream of gender analysis and resilience analysis differ in their epistemological and methodological biases. Put very crudely, the central analytical impulse of gender analysis is one of critique - in which inequality is a central trope and where the case built is one that requires redress - whereas the central analytical impulse of resilience analysis is one of complex causal explanation - in which the modelling of coupled systems in terms of critical factors, dynamics and thresholds is a central trope and where the case built is one that predicts adaptation or transformation and calls for action to trigger, facilitate or avoid this. These fundamental differences are problematic in trying to bring together gender analysis and resilience analysis, raising difficulties about how to reconcile understandings of

change and ways of finding out about these changes. Accordingly, section 4 now turns to review the ways in which gender analysis and resilience analysis have been brought together so far in fisheries work, with particular reference to small scale fisheries, in order to analyse how these differences have shaped and limited attempts to bring them together.

4: How has gender analysis and resilience analysis been brought together so far with special reference to small –scale fisheries work?

In this section, we review the existing literature on gendered dimensions of small-scale fisheries and discuss how far knowledge about gender relations has been brought together with resilience analysis. In doing so, we draw insights from a broad review that focuses mostly on two rather different sorts of studies in which gender analysis and resilience analysis have most closely approached one another: firstly (in 4.1), those in which gender has been ‘integrated’ into the analysis of social and ecological resilience, and secondly (in 4.2), those in which researchers have analysed gendered social relations embedded in fishery-based livelihoods, most notably from the perspective of feminist political ecology. We argue that studies that seek to combine gender analysis and resilience analysis often struggle to do justice to both approaches. More often selected concepts from one form of analysis are imported or added on to a study that is almost entirely grounded in the other form of analysis thus limiting the potential of one form of analysis to strengthen the other.

4.1 Bringing gender into resilience analysis

While the importance of a gender lens in small-scale fisheries has been well recognized in the fishery literature (Bennett, 2005; Choo et al., 2008, Williams, 2008; Williams et al., 2012; Nunnan, 2014; Weeratunge et al., 2014), ongoing resilience and adaptation research in small-scale fisheries has often sought to include gender through analysing gender gaps in resilience and/or adaptation. We review these and their limitations in 4.1.1 below. Simultaneously, there have been notable efforts to attend to the impact of social structures and social attitudes on resilience and/or adaptation. Although gender has been largely absent in these, they represent a significant step by resilience researchers towards examining social relations. Accordingly, we ask how far such innovations have opened up or closed off avenues for gender analysis in 4.1.2.

4.1.1 The binary approach to gender

When gender is analysed through the existing resilience frameworks, studies tend to employ a binary approach which considers gender as a variable but without linking it to social theories and concepts of gender relations. Our review of literature on gender and fisheries reinforces Carr and Thompson's (2014) findings from their review of literature on gender and climate change adaptation in agrarian settings. They observed, as we did, that "most contemporary analyses are predicated upon a construction of gender as binary (men versus women)" (182). Typically existing or new variables of interest to the analysis of social-ecological resilience are sex-disaggregated⁶, with a particular focus on differences in natural resource related access, roles, management and decision-making, in order to enumerate gaps between men and women. Some adaptation literature, like some ongoing fisheries resilience research, has further differentiated its categories of men and women by intersecting

⁶ They are sex-disaggregated in that they distinguish only between male and female as biological categories.

variables such as age, class, caste and household headship (Nelson and Stathers, 2009; Onta and Resurreccion, 2011; Huynh and Resurreccion, 2014). This move engages with the long-standing critique that men and women are not homogenous groups (Jackson, 1998; Kandiyoti, 1998), and represents a major improvement on collecting binary data.

This inclusion of gender as a category has contributed significantly to involving women in the analysis of power relations. A large number of studies, especially in the climate-change literature, have analysed the potential negative consequences of environmental changes on women relative to men by exploring their gender roles and rights and access to credit, technologies, information and knowledge (e.g. Boyd, 2002; Ahmed and Fajber, 2009; Segnestam, 2009; Sultana, 2010; Djoud and Brockhans, 2011; Tatlonghari and Paris, 2013). The increasingly routine collection of binary gender data, and particularly of more sophisticated intersectional data, is a substantial step forward, making gender 'gaps' more visible and offering a persuasive statistical framework within which more complex qualitative analyses can be deployed. These studies demonstrate the uneven distribution of impacts of change in relation to gender and argue against looking at the community or household as homogenous units when exploring the impact of climate change.

However, the understandings of gender as binary overlook the dynamics of gender position, and they do not explain how people occupying different gender positions negotiate around the natural and other kinds of resources that they share. In this way, they miss the theoretical insight that it is the way that individuals are embedded in specific circumstances and social relations, rather than the categories to which they belong, which plays out in how they are affected by and respond to shocks in different ways (Kaijser and Kronsell, 2014). As a result, much gender analysis in resilience and adaptation research faces similar limitations: the lack of social theoretical content does not open up space for critical analysis, although it does provide some value for the basic targeting of interventions (Locke and Okali., 1999:283) and facilitates straight-

forward design for impact assessments (Carr and Thompson, 2014:191). In this way, 'mainstreaming gender' in resilience analysis for small-scale fisheries as well as other ecological systems has been seen largely in terms of identifying what 'additional' data needs to be collected to enhance existing analyses⁷. The literature reviewed, however, reveals little attention to asking (or formulating) specific gender questions or making deeper interpretive sense of the resulting gender findings. This can compound a sense of frustration amongst natural resource and resilience researchers regarding the value added by integrating gender into their studies.

4.1.2 The analytical turn towards institutions and attitudes

In attempting to better grasp the social dynamics of people's responses to change, resilience analysis has paid increasing attention to social structural and institutional variables, including factors such as the relative homogeneity of users, or the level of social capital, as well as increasingly meso and macro level institutional factors. Whilst these shifts are important in approaching concerns around governance and collective action, they are often framed in such a way as to perpetuate a somewhat consensual and harmonious view of community, to be over-optimistic about its capacity to respond to changing circumstances, and to neglect intra-community or intra-household relations. For example, despite the focus by Langridge et al. (2006), Marshall et al. (2007) and Ross et al. (2010) on the importance of institutions, all are notably silent with respect to gender and power relations. In part, this is due to the focus in research analysis on system properties that can be mobilized for adaptation and transformation. In this way, social

⁷ This story is by no means unique to fisheries research on resilience, but an all-too-common feature of the history of gender mainstreaming in research (Cornwall et al., 2007). Nor is this surprising, given that this work is often undertaken by inter-disciplinary teams within relatively hierarchical research structures within which social scientists and gender specialists are often non-existent, marginalized or heavily over-worked.

relations are identified as an important element that enables or constrains the system's overall adaptive capacity and they tend to be conceptualized and quantified in ways that are amenable to modelling this (e.g. Bodin et al., 2006; Ernston et al., 2010; Moore and Westley, 2011; Barnes-Mauthe et al., 2014). For example, Bodin et al. (2006) propose a methodology for quantifying the structure of social networks to inform analysis of how far specific social networks might enable collaboration and coordination over efforts to manage natural resources. While these analyses make significant strides in considering how social structures may impact on the possibilities for resilience, they do not address dynamic power relationships within groups which are critical for assessing the extent to which networks can be mobilised to achieve different kinds of changes with different kinds of outcomes for different people. For instance, they miss the way in which gendered power relations constrain the potential that social capital offers for equitable or progressive change (Cleaver, 2005) and may miss how ecological system changes may threaten existing coping mechanisms (see Overå, 2011).

At the same time, some resilience research has begun to engage increasingly strongly with individual concerns around attitudes and psychologies, including people's values, interests and perceptions of risk and well-being. This has helped resilience research and adaptation research (Brown and Westaway, 2011; Coulthard et al., 2011; Coulthard, 2012) unpack why people's responses to change may not always appear rational in relation to the concerns of economics or ecology. This is clear in the case of fisheries: fishermen rarely leave fisheries even when they recognize reduced fish catches and income, because for example, stopping fishing undermines their own life satisfaction (Coulthard, 2012). Both these tendencies make important headway in approaching concerns around agency (which in many ways represent the key characteristics that distinguish the way societies work from the way ecosystems work). Indeed, Armitage et al. (2012) provide further variables that influence people's adaptive strategies such as social ties, trust, identity, perceptions, aspirations and

satisfaction. These subjective and relational variables are very useful in understanding people's decisions associated with potential trade-offs at intra-personal level, but still do not have the capacity to explore negotiation processes and trade-offs between individuals. In this way, efforts to build power and agency into resilience analysis has not yet managed to open up sufficient understanding of the processes of negotiation in gendered social relations. This would necessitate a further focusing of attention on the way in which people's various strategies for adaptation and transformation are differentiated by dynamic gender positions and social relations.

4.2 Bringing resilience into gender analysis

Turning now to the second set of studies, those emanating from gender analysis, we highlight what has been learnt from studies about: masculinities in fisheries (4.2.1); gender relations around informal trading (4.2.2); gender and social vulnerability in fishing communities (4.2.3); and feminist political ecology and closely related contributions in human geography (4.2.4). In each case, we ask what we might learn from these studies for resilience analysis and what limitations these studies have in terms of opening up understanding about resilience. We conclude that the very considerable deepening of knowledge about gender in relation to the natural environment generally falls short of engaging directly with ecology, remaining for the most part entirely within the social domain.

4.2.1 Masculinities in fisheries

Although there is a rich literature on the role of masculinities⁸ in fishing communities, it has been largely dissociated from thinking about or analysis of social-ecological resilience. It comprises of two veins: one anthropological, and the other political economy.

Masculine identity has featured prominently in the anthropological exploration of the culture of fishing communities (Acheson, 1981). Small-scale fishing - as high-risk and individualized occupation, with highly variable cash returns, and which often encompasses a high degree of mobility (Fabinyi, 2007, Geheb et al., 2008; Mojola, 2011) – has often been associated with the dominance of masculine identities that value men's risk-taking and a sharp distinction of gender roles, fueling social problems around alcohol consumption, violence, and risk-taking sexual behaviour (Allison and Seeley, 2004). In these contexts, fishing is central to what it means to 'be a man' and has consequences for perpetuating deeply embedded cultures of gender.

Since men have dominated the fishery sector and the fishery research sector, the gender orientation of political economic analysis of resource management was initially focused on power relations among men, demonstrating that responses to change are influenced by masculine power and male authority. Studies show that, in the processes of environmental or policy changes, a small number of powerful men take advantage of changes as opportunities to further benefit from natural resources and strengthen their influence over the social and ecological system within which they are embedded (Nadasdy, 2005 in Yukon, Canada; Neiland et al., 2005 in Nigeria; Russell and Dobson, 2011 in Malawi). Some studies posit that those who have economic or political power exploit natural resources in their own interests, while those who used to use natural resources in sustainable ways are excluded from the

⁸ Masculinities are about what it means to be a man in a particular gender order: as such, masculinity is not men themselves, but rather is about the practices and identities of being a man in a particular time and place (see Connell, 2009).

new system (Sneddon and Fox, 2012 in Mekong river development; Adduchi, 2009 in shrimp farming in India).

Whilst these studies address resource governance, they do not engage directly with questions of ecology and are often either positioned or viewed as critiques of the policy ideas associated with resilience analysis. The lack of attention to ecology may have limited these studies appreciation of the role of ecological stressors, shocks and feedbacks in the ongoing constructing masculinities. From a gender perspective, their focus on masculinity means that they tend to only partially elucidate other gender dynamics that are at play in fishing communities, but see Cole et al (2015) for an important exception.

4.2.2 Gender relations in financing and trading in small scale fisheries

Research on gender relations in informal fish trading is another rich source of information that has been important in over-turning the idea that gender relations are marginal to what is perceived in most places as a predominantly male occupation. Qualitative studies in sub-Saharan Africa reveal significant power hierarchies among female traders and their relationships with male fishers. In West Africa, for example, female traders often own boats and fishing gear, facilitating male fisher's access to resources (Overå, 1993:2003:2005; Bennett, 2005). Small-scale fisheries often involve reciprocal relationships in the processes of production, trading and marketing between boat owners and their male fishers, male retailers and female processors, and fishermen and female traders. Although unequal, these relationships can be the basis on which poor men and women negotiate and mobilize resources in times of need to cope with difficulties and to maintain their livelihoods (Walker, 2001; Jul-Larsen et al., 2003; Gordon, 2006; Merten and Haller, 2007; Lwenya and Yongo, 2014). This may be

one reason why small-scale fisheries remain attractive for the poor despite concern over declining fish catches.

In these kinds of contexts, a male fisher's capacity to maintain fishing activities and to adapt to environmental change is influenced by his dynamic relationships with female traders as well as by the state of ecological systems (fish stocks). Further, studies in fishing communities show that female traders' positions change over time according to social positions of their male kin and their own positions in the household (Overå, 1993) as well as due to wider changes in gender norms and structures, thus indicating that gender relations have their own dynamic and that changes in them have implications for fishing livelihoods.

These studies offer a deeper sort of understanding as to the process of social and environmental change and its gendered unequal consequences. Capacities to adapt, either individually or collectively through co-management institutions, and adherence to fishing regulation, are not only significantly affected by fishermen's income and well-being, but also by gendered social relations, as well as vice versa. Importantly, whilst gendered social relations influence the ways people use resources and shape their adaptive mechanisms, individuals' strategies are primarily orientated to improving their lives and those of their families in a much broader sense and as such may or may not be congruent with ecological resilience. Whilst questions of ecology are rarely addressed, these studies illuminate more clearly the gendered dimensions of social resilience in relation to resource-based livelihoods. As such, these studies are suggestive of how rich qualitative data could contribute to the aims of resilience analysis to generate a better understanding of the centrality of gendered negotiations to the possibilities for and constraints to adaptation for different individuals.

4.2.3 Gendered vulnerability in Fishing Communities

Gender has figured prominently in the attention to vulnerability in fishing communities that was spurred by the widespread recognition in the 1990s and the early 2000s that HIV infection rates in these communities in some developing countries were much higher than those of non-fishing communities (Kissling et al., 2005). The high infection rates were understood as resulting from gendered social norms and practices in informal fish trading between (migrant) fishermen and female traders (Allison and Seeley, 2004; Béné and Merten, 2008; Seeley et al., 2009). Here the livelihood adaptation strategies of the poor and marginalized (migration, diversification in livelihoods through seasonal fishing, and transactional sex) resulted in increased vulnerability to HIV.

Within this literature, particular mention must be made of Merten and Haller's study (2007) in the Zambian Kafue flats. Here Ila women, formerly agro-pastoralists, started trading fish because their incomes from maize fell. The Ila women negotiated directly with the Lozi fishermen on the shore or at the fishermen's houses, instead of the fish markets: in this way, they were able to sustain their activities even during the season when fishing was officially prohibited. Furthermore, some poor women with limited capital accessed fish from the fishermen in exchange for sex, a practice called 'fish for sex'. The Ila women legitimized fish for sex by constructing it as *lubambo*, an old customary regulation of extramarital sexual relations through which women used to fulfill their material needs in times of need. The authors closely explore how women constructed, exercised and renegotiated their decisions to engage in 'fish for sex'. In this way, gender research on HIV and AIDS has contributed to understanding the dynamics of some marginalized fishing societies. It provides a complex picture in which the gendered exercise of agency interplays with wider or external threats such as environmental and economic changes with deeply ambiguous implications.

Whilst the Kafue Flats study shows how gendered negotiations to reduce livelihood vulnerability can frustrate the regulation of off-season fisheries and exacerbate vulnerability to HIV infection, our review suggests that studies of this sort tend not engage directly with ecological system and questions of socioecological resilience. We speculate that direct engagement is in part limited because when poor women and poor men are asked about risks they face, ecologically-based risks may not surface immediately or in a straight-forward way. For instance, studies of gendered insecurity in relation to climate change often indicate that attempts at analyzing perceptions of climate change are frustrated by the low priority and lack of concern given by poor women to these factors in their everyday struggles (Terry, 2011). Thus while the ecological risks are critical, they are often expressed by poor men and women as secondary to more urgent concerns or may be so taken-for-granted that they are not mentioned at all. This can create challenges for approaching these ecologically issues in gender research. In turn, while the findings of such studies are highly relevant to research on vulnerability (which is a centre point of resilience), it can be difficult to integrate gender findings with resilience research when vulnerability is framed socially in the former and ecologically in the latter.

4.2.4 Feminist political ecology

In contrast to other forms of gender analysis, feminist political ecology has directly attempted to engage with the indivisibility of the social and ecological systems and is credited with making a valuable contribution to the broader political economy through its sophisticated engagement with power and agency. Whilst we found no self-identified FPE of small-scale fisheries, there has been a rich strand of analysis focusing on other common-pool natural resources, and particularly on forests. For example, in her case study of forest conservation in Nepal, Nightingale (2006) found that women exercise their agency to sustain their forest use because their practices in

the forest are the foundation of their gender identities. The forest resource is central to producing and reproducing social inequality, and as such women's gendered agency serves to sustain existing social inequality as well as resist new resource use practices. This indicates that agency is not simply about an individual pursuing their own wellbeing, but operates in more complex ways as men and women renegotiate their intersectional identities in the context of asymmetrical power relations.

However, despite early enthusiasm for feminist political ecology, it has become something of a 'disappearing subject' with very few studies self-identifying as FPE even though many are clearly closely related to the concerns and approaches of FPE (Elmhirst, 2011a: 130). The reasons for this are complex but include a general de-politicisation of gender research, new developments in gender theory and sensitivity towards its 'feminist' label (Elmhirst, 2011a:130). Early engagement with FPE as a 'framework' meant that concern with gender was often "institutionalized into a series of tools and techniques that are far removed from the transformatory potential of gender as a feminist concept" (Elmhirst, 2011a:130) and often presented 'women as a group and gender as a category' (Rocheleau, 2008:716), again reifying the notion of gender as binary.

In the light of new developments and new interests in gender theory (see Cornwall et al., 2007), proponents of FPE have been arguing for a re-invigoration of this debate. This resurgence has also seen a shift in focus from women or other specific social groups to interdependent and dynamic power relations within family and community (Ge et al., 2011; Nightingale, 2011; Truelove, 2011, Elmhirst, 2011b). For example, Resurreccion and Elmhirst (2008) explore "how gender subjectivities, ideologies and identities are produced, employed and contested within natural resource governance" (3).

Similarly, Elmhirst's case study in Indonesia (2011b), explains how locally recognized masculinities and conjugal relations influence forest management. The theoretically grounded approach thus enables researcher to address the emerging queries of 'how' and 'why' instead of 'what'. Although not self-identified as FPE, Resurreccion's study in the Tonle Sap Great Lake in Cambodia (2008) is closely informed by gender theory and explores power relations over a shift from male dominated traditional fishery management to a newly formulated management institution in which women are involved. She found that women legitimize their position in the management institution and benefit from the management programs through influential male relatives. In this way, the new co-management system is traditionalized and reproduces male power and authority. Her case study demonstrates the complex ways in which gendered power relations shape processes of environmental and institutional change and asks direct questions associated with environmental concerns.

These studies can be viewed as frustrating by resilience researchers - as they are not orientated towards identifying solutions or developing parsimonious models. In this sense, both their complexity and ambiguity can be unsettling and is often either positioned or interpreted as critique. Moreover, despite their close engagement with natural resource use and governance, none of these studies effectively counters the question that resilience scholars have asked, namely "'where is the ecology' in social analysis?" (Stone-Jovicich, 2015:25). Indeed, Peterson carefully evidences how FPE, and political ecology more broadly has largely been feminist political *economy* and has failed to say anything about ecology, or about the feedbacks to and interactions of social 'systems' with ecological ones (2000: 234). In this sense, FPE continues the tradition of gender studies which have largely ignored the natural world.

So to sum up, whilst there are increasingly sophisticated efforts to integrate gender analysis into resilience research, “resilience thinking’s view of the “social” is overridden by ecological understandings of system characteristics and dynamics” (Stone-Jovicich, 2015:25). Similarly, whilst gender analysis in small-scale fisheries (and more broadly in relation to other natural resources) has made progress with understanding gendered social dynamics and individuals’ gendered adaptive strategies in relation to natural resources, it has so far failed to engage directly with environmental and ecological system dynamics. So far, it has proved challenging to develop a meaningful account of the social relations and gender in relation to social-ecological resilience (Cote and Nightingale, 2012; Harrison and Watson, 2012; Keck and Sakdapolrak, 2013). Whilst there is as yet no unifying or mutually-acceptable framework or approach to act as a ‘bridge’ to connect these two important fields of research, progress in each field in approaching the other has generated many valuable insights for resilience analysis. So, going forward, what are the possibilities for a closer engagement?

5: Re-invigorating the encounter between gender analysis and resilience analysis

Fundamental incompatibilities between gender analysis and resilience analysis (reviewed in section 3) mean that gender concepts are often stripped of theoretical content when they are integrated into resilience analyses (as reviewed in section 4)⁹. Whilst the ‘integration’ of gender into ongoing social-ecological systems research on resilience in small-scale fisheries, is both desirable and necessary (Bennett, 2005), it cannot, on its own, achieve what is needed. Indeed, as Bennett (2005:451) notes, it is “understanding of *the complexity*” (emphasis ours) of gender relations and their “nuances” that are needed to better inform policy-making for fisheries management.

⁹ This process parallels that loss of critical edge that occurs when social concepts are ‘naturalized’ in social-ecological analysis (Bush and Marshke 2014, p. 49).

So, we argue that the challenge is to enable the respective strengths of both approaches to be sustained, whilst working to extend and deepen their mutual engagement with one another.

Rather than seeking a single unifying framework for gender and resilience analysis that works for small scale fisheries, we suggest fostering a closer critical and constructive conversation between resilience analysis and gender analysis around small-scale fisheries. A plural research strategy to develop this engagement could combine, on one hand, high quality gender analysis on questions that have a bearing on the social-ecological resilience of small scale fisheries with, on the other hand, efforts to increase and improve the collection of gender disaggregated data in ongoing small-scale fisheries research. There is substantial progress that is being made with the latter, and so it is to the former that we devote the rest of our attention in this paper.

Below, drawing on our analysis above and our own collaborative experiences, we highlight what we see as key theoretical and methodological components of re-invigorating the engagement between gender analysis and social-ecological resilience analysis. The possibilities for a closer engagement must be premised on a theoretically and methodologically rigorous gender analysis (Diamond et al, 2003). Gender analysis in small scale fisheries that maintains its critical edge has the potential to ask meaningful gender questions about what changing social-ecological systems mean for changing gender relations and how changing gender relations may impact on ongoing transitions in social-ecological systems (Elmhirst, 2011a:130).

Here we highlight three core theoretical principles of gender relations that have considerable potential to add value to interdisciplinary research but which are often 'lost' in attempts to integrate gender into resilience analysis or social-ecological frameworks (Cote and Nightingale, 2012; Keck and Sakdapolrak, 2013). They confirm

three key aspects of social diversity and social power: firstly, gendered power is not fixed but is dynamic and relational necessitating that we go beyond gender as binary to examine how gender relations are negotiated (5.1); secondly, that gendered social relationships are not simply consensual or conflictual but are interdependent, necessitating attention beyond 'gender gaps' to gendered trade-offs and tensions (5.2); and, thirdly, that the power to sustain or change existing access to resources is not only derived from the material inequalities but is also generated by the discursive and the ideological underpinnings of gender inequality, thus requiring attention to gender norms, meanings and ideas (5.3).

5.1 Beyond gender as binary to negotiating gender relations

A binary approach can only provide a static snapshot that reads off power relations and their influences from existing patterns of differentiation. In reality, gender relations are negotiable and variable: as Bennett emphasises "gender roles in the fisheries sector are dynamic and have to change in relation to each other and their activities in order that livelihoods are protected and the ultimate goals of food provision, family security and socio-economic advancement can be achieved" (2005:452). Changes in everyday practices at a personal level may eventually influence other people's gender practices, leading to changes in gender practices at a societal level. Understood in this way, social structures of gender relations are not static but rather dynamic, requiring ongoing reification to enforce the status quo, or being redefined in either progressive or regressive directions. In this way, engaging directly with power and agency is at the heart of a relational gender analysis. This critical relational approach enables researchers to deepen their focus of research from cataloguing gender characteristics and differences to examining the ways in which marginalised men and women negotiate changing gender relations. This move opens

up understanding of how marginalised men and women experience and respond to ecological shocks or stressors, including new management regimes.

Within small scale fisheries, the focus on production has historically meant a narrow focus on the catching sector, usually male-dominated, and a neglect of those involved upstream, in financing or otherwise sustaining fishing activities, or downstream, in processing, trading or consuming fish within and beyond households and communities, where gender relations are more directly visible (Bennett, 2005). In this way, critical gender analysis is able to contextualise changing fishery resource behaviours within a wider web of dynamic gendered social relations and can explore in a much broader sense how changes in gendered power relations in a specific fishing community or industry may impinge on changes in fisheries management (Overå, 1993) and vice versa, how changes in fishing stocks or their management can impinge on changing gender relations (Kawarazuka, 2015).

Gender analysis from this perspective explores the ways in which different individuals negotiate over natural resources and their changing access to them in their everyday practices and through their (interdependent) social relations. Such a gender analysis will not achieve the aims of social-ecological resilience analysis – which is focused on assessing the outcomes of, or potential for, change in terms of system properties and thresholds – rather, we are saying that it will powerfully deepen the appreciation of what different possible social-ecological resilience outcomes might mean and for whom.

5.2 Beyond isolating 'gender gaps' to gendered trade-offs and tensions

An over-emphasis on gender gaps can get in the way of a more nuanced appreciation of gendered trade-offs and tensions and the ways in which they can be leveraged by different men and women for different purposes. Rather than presuming that different categories of men and women are in competition over resources, exploring the interdependency of relations between unequal individuals, households and groups makes visible the ways in which less powerful people exert agency in their negotiations. Interdependency is intrinsic to gendered power relations and therefore it can be a weapon for the marginalized for negotiating their position in their favour (Connell, 2009). For example, some poor fishermen sustain fishing activities through negotiations with more powerful fishermen for instance over species to be targeted or over fishing areas (Overå, 1993), and likewise, female traders may sustain access to fish through renegotiating their relationships with particular fishermen (Merten and Haller 2007, Kawarazuka, 2015).

Everyday practices (e.g. fishermen going to fish, interacting with female traders and giving cash to their wives) influence gendered positions (Connell, 2009). Consequently, changes in these practices result in changing their bargaining power in the family and community, influencing the interdependent relations through which poor men and women ensure security and maintain their well-being. Therefore, fishermen's decisions with respect to changes in their livelihoods, and thus their means and processes of adaption, are not made simply according to whether they have alternative economic livelihoods or whether they place a high value on fishing as a man's job, but also with respect to how this might affect their prospects for marriage, their position as husbands or fathers, their support of their younger brothers, their standing in the fishing cooperative or the security of their sales to specific female traders. This broader calculus inevitably strays way beyond the natural resource (Bennett, 2005) or ecological system of interest to resilience researchers, but

by doing so it offers a “clearer understanding of the linkages among gender equality, natural resource management and sustainable development” (Brewster 2004: i). Importantly, attention to gendered trade-offs and tensions reveals unexpected areas of strength and vulnerability for men as well as women, for the powerful as well as for the marginalised. These are often overlooked where agency is ignored and gender interests are just read off from binary data about gender roles. However, these subtle and wide ranging interdependencies, their importance for gendered human security, and their value in fishing communities, is well evidenced (Bennett, 2005). In this way, critical gender analysis focuses on the trade-offs and tensions in interdependent relationships, that involve both cooperation (and joint interests) and conflict (and individual interests), among men and women in different social positions. This more sophisticated analysis of the ways in which human agency is profoundly imbued with gendered power relations (Davidson, 2013:22-23) is valuable for those trying to influence or understand behaviour in small scale fishing communities. It is also useful for understanding how institutional changes for resilience may impinge on unequal exchanges, making some groups of people more vulnerable (Hornborg, 2009; Davidson, 2010; Davoudi, 2012).

Again, such an analysis will NOT answer the question : ‘Is this social-ecological system resilient?’, but it can add depth to understand the changing negotiations around changing common pool resource use and management, and interpret what this means for gendered power relations, and the resulting resilience, vulnerability, and ‘room for manoeuvre’ of different men and women arising from these dynamics. This can contribute towards shifting the emphasis of resilience research (Anderies et al., 2006) towards a field of debate that “opens up issues around values,... equity and justice” in order to “formulate questions about which resilience outcomes are desirable, and whether and how they are privileged over others” (Cote and Nightingale 2012:480). This will provide a strong common ground for starting new conversations about how interventions designed to enhance social-ecological

resilience may be linked to gendered social relationships and changes in gendered power relations.

5.3 Beyond material resource to include norms, meanings and ideas

Norms, meanings and ideas are central to gender relations and purely materialistic or economic account of gender relations mis-interpret how they are deployed and (re)shaped in ongoing negotiations over natural resources. The nature of the gendered negotiations based on these interdependent relationships often differs from that which might be anticipated on the basis of material resources or purely economic interactions. Often support can be claimed from others by leveraging gendered relationships: appealing to the sympathies and loyalties of immediate and wider natal and marital kin, friends, community groups and leaders or other patrons. Women's agency is necessarily different from men's agency, as it is shaped by embodied subjectivities. Wifehood and motherhood shape women's perceptions and expectations of the conjugal relationship (Whitehead, 1981) and influence their emotions of pleasure, shame and guilt (Kabeer, 2000). Also, the interdependence among family members means that power 'offers [...] inducements and compensations to those deprived of power' (Kabeer, 2000:336). In this regard, the social protection that women receive through marital cooperation may enable them to fulfil their material needs and ensure long-term security. Therefore, rather than challenging men directly women may leverage their gender position and justify being provided for by men without the feelings of powerlessness or shame (Moore, 1986; Kabeer, 2000). Perceptions of security, insecurity and risk, and as a result desired adaptive strategies, are shaped by such gendered agency and necessarily evolve over the life course as women and men's gender positions and significant relations change over time.

Wider gender norms, including those about appropriate resource use and governance, are often treated as 'givens' that stand for actual behaviours and are often valued in terms of Western sensibilities. However, gender norms and the meanings with which they are invested are highly context-specific, must be constantly (re)asserted to persist, and may be iteratively renegotiated in subtle or ambiguous ways. Rather than seeing gender norms as 'rules' determining or constraining behaviour, it may be more useful to think about gender norms as ideas that have discursive value in seeking support for, or sanction of, different strategic behaviours. Indeed, there are wide variations in actual gender practices which in many situations are 'concealed' or 'hidden' under a veneer of consensus over hierarchical gender ideologies (Moor, 1986; Kabeer, 2000; Connell, 2009). A rigorous account of gender needs to combine observation of actual behaviours (empirical analysis) with what people say about gender (narrative analysis) in order to gain critical analytical purchase on what gender norms really mean for gender relations.

As Nightingale's forest conservation research in Nepal showed women may be invested in and actively sustain gender norms in ways that can frustrate the introduction of new resource practices (2006). Apparently conservative gender norms can also be used implicitly or explicitly by women to leverage power in their relationships with their husbands. For instance, Kawarazuka (2015) shows for coastal Kilifi in Kenya how women strategically organize their routine work to sustain their own long term security: in this context, young women often prioritise cooking for a husband and his friends over fish processing to earn income. This is because cooking is an opportunity for women to demonstrate that they are good wives and women use it to gain bargaining power within their relationships. In contrast, older women tend to invest their time and labour in their sons, for instance by looking after their children, because they consider that building their sons' support for them is a better strategy for long-term security later in life than being economically independent through fish processing. Such analysis of gender norms, meanings and behaviours will not identify

gender ideologies that are 'better' for resilience, but does open up understanding of how different men and women may be invested in existing practices and beliefs, and the reasons why they may seek to change, retain or renegotiate these. This, in turn, opens up understanding about how or why different individuals experience and respond to ecological shocks, stressors or changing management regimes.

To sum up, gender analysis that is theoretically and methodologically rigorous can make significant contributions to critical thinking around shared challenges of social-ecological resilience in targeted communities. These kinds of contributions can powerfully animate the strengthened collection of gender disaggregated data in resilience analysis and as a result will add depth to understandings of how gender relations in specific contexts relates to cases of social-ecological crisis, adaption or transformation. Whilst it falls short of analysing ecological dynamics directly, critical gender analysis can add value to understanding the interaction of society with ecological systems, and can contribute to ongoing debate about resilience of what and for whom. The next section makes three practical suggestions to stimulate joint collaborative work between gender analysis and resilience analysis.

6: Practical Starting Points for Collaboration

In institutional terms, this needs to involve both joint research undertakings and a sustained commitment to building an interdisciplinary debate in which specialist contributions are valued and brought into conversation with one another. For those engaging in collaborations between gender analysts and resilience analysts, we offer three very practical starting points that we have found useful in our own attempts to work with or alongside multi-disciplinary teams towards a more meaningful gender analysis for small-scale fisheries research. These are: shifting from data collection and checklist approaches to question-orientated enquiry and an emphasis on making

sense of data; improving the rigor of qualitative gender research including through enhanced reflexivity; and moving beyond an over-reliance on participatory and focus-group discussion methods.

6.1 Moving the emphasis from data collection and check lists to enquiry and interpretation

The focus on collecting gender data in ongoing natural resources research now needs to be complemented by a much more thorough consideration of what gendered questions are being asked and how to make sense of data to answer them. We suggest here that collaborative research should begin by joint agreement of the overarching gender questions that are of mutual interest to both gender researchers, resilience researchers and other stakeholders (see also Locke and Okali 1999). This framing of questions provides vital direction for analysis and interpretation, as well being important in securing buy-in and relevance of collaborative undertakings.

Formulating context-specific research questions that are firmly rooted in critical gender theory and which relate to ongoing concerns around social-ecological resilience lays the foundation for strong research practice. The identification of gender questions for research, as with all research, needs to be grounded in a strong appreciation of existing knowledge about gender and environment in specific contexts. This initial step of taking stock of existing knowledge is often side-stepped in the rush to integrate gender. It can however provide valuable briefing for an interdisciplinary team, add depth to the delineation of context-specific questions, and provide essential context for interpreting findings. Critical research questions can guide research design (data collection, analysis and interpretation) in the direction of probing gendered social relations and the way in which they are being (re)negotiated around natural resources. The context-specific questions guide not only data collection, but also analysis and interpretation and ensure that gender research is

appropriately grounded in existing knowledge about gendered social relations, as well as the ecological system, in every instance. Importantly analysis is not the end point of such an approach – the discussion of findings, debates over their interpretation in relation to context-specific concerns around social-ecological resilience, and their meaning in relation to the wider field of knowledge about gender and natural resources all need to be seen as core activities for a successful collaboration.

Successfully raising the bar for engaging gender analysis with resilience research will necessarily involve building gender research capacity as well as direct collaboration with gender researchers particularly during research design and research analysis phases. In this way constructive debate over gender and resilience is hard wired in the research design and collaborative working practices, ensuring that gender researchers and resilience researchers are fully engaged throughout.

6.2 Improving the rigor of qualitative gender research and its reflexivity

Researching gender is not straight-forward and it is vital to strengthen the rigor of qualitative gender methodologies that are used in research about social-ecological resilience. A core part of the challenge about researching critical gender social relations is that these are by definition ‘hard to see’: they may be reflected in material outcomes, but their workings and underlying dynamics are expressed in everyday practices and as such are often either taken-for-granted or else covert. Asking ‘who makes the decisions in your home?’ will elicit a generalized and often normative answer that may reveal more about how the person speaking would like to be seen than what actually happens. As a result, effective design of rigorous gender research often employs plural methodologies with the aim of enabling attention to

contradictions, tensions, subtleties and ambiguities. These enable researchers to probe for a closer reading of who is doing what (or saying what), when, and why.

Rigor in all qualitative methodologies is intrinsically reliant on the field researcher's engagement with the underlying aims of the enquiry and critical thinking about researchers' relationships with respondents are central. This latter enables a proper reflection on how a researcher's positionality affects her or his relationships with respondents and mediates their behavior and answers to questions (e.g. Callaway, 1992). For gender research this needs to include asking: how do local people view external researchers who have an interest in natural resource conservation and who may have brought significant funds for community activities? However it also needs researchers to go beyond this to ask: how do local men and women various see me as a (gendered) individual? For instance, older men may be reluctant to discuss their problems disciplining young daughters-in-law with young unmarried male researchers and may prefer to offer accounts in which their patriarchal authority is over-stated, and similarly divorced men may feel more comfortable talking to experienced middle-aged female researchers about the tensions in their marriages. In both cases, this reflection is important for interpreting what the resulting findings mean. Findings from qualitative research are shaped by the positionality accorded to researchers by local people (Caplan, 1993) and the specific narratives that respondents offer are tailored towards those they feel will make sense to the researcher (England, 1994; Rose, 1997).

Where qualitative research is taken up by institutions with hierarchical work cultures, field work is often delegated from the researcher to assistants of various sorts, reported back to the researcher who then leads the analysis and interpretation of material with little further reference to field workers. Whilst field worker training and orientation, and other measures like the verbatim transcription of interviews, can ameliorate the situation to some extent, such hierarchical approaches to field research

are deeply problematic for all qualitative social research for several reasons (see Camfield 2014). Chief amongst these are: the loss of the researcher's responsive or opportunistic probing of telling events or lines of discussion during fieldwork; the lack of the experience of the production of data to feed into the analysis; and the absence of reflection about how the way in which the data was generated was shaped by the way in which respondents saw the researcher. Doing 'good' qualitative research, including good gender research, requires a more direct engagement between senior researchers and data collection. Whilst this has traditionally been achieved by researchers conducting their own fieldwork, it is also achievable where a small but skilled team of researchers are involved in the entire research process (design through data collection to analysis and interpretation). Key elements of 'good' practice for such teamwork include: fully enrolling fieldworkers in the critical aims and design of the enquiry so that they can attend to and probe the relevant issues in the field and engage in critical discussion over the meaning of resulting data; additional notes on the context, nature and participants in each interview, conversation or observation that go beyond the verbal interactions usually captured in fieldnotes or recordings and which are salient to their interpretation; recorded reflections on the research process, often in the form of research diary, on experiences in the field and thoughts on how respondents reacted to and made sense of the researchers and the encounters they solicited; and direct involvement of fieldworkers in verifying the analysis and interpretation of data in research outputs.

6.3 Moving beyond over-reliance on participatory and FGD methods

A participatory approach has been the dominant method for understanding the social part of social and ecological systems and this is also true of more recent investigations of gender in this context. It fits very well with the strategies of resilience and co-management such as integrating local knowledge and learning from the local people's

own experiences, and the approach is itself considered a process of finding effective adaptive strategies (Pelling et al., 2008; Tschakert and Dietrich, 2010; Armitage et al., 2011). The participatory approach has been viewed very positively as a means of sharing power, gaining trust among the stakeholders and having common vision and goals to achieve ecological sustainability (Trimble and Berkes, 2013).

Whilst participatory methods, and targeted focus group discussions in particular, appear to offer a tempting shortcut to accessing the views of the marginalized, a more theoretically-informed consideration points to their methodological shortcomings. As Nadasdy (2005) points out, the use of participatory methods in natural resource management often lacks attention to power, including gender relations. Participatory methods are often defined uncritically and are almost equated to an antonym of a top-down approach. The (nominal) inclusion of local people in research projects seems to be accepted unproblematically as producing a reliable instrument for understanding community interests in a gender-neutral way.

Where NR researchers have acknowledged the problem of power in knowledge production, for example there is a tendency to reduce this to a technical problems that can be resolved by focusing on how to organise workshops and build relationships with participants (Pohl et al., 2010). Johnson et al. (2004) note that participatory research in natural resource studies tends to lag behind 'best practice' (2004:189) and "may be particularly unrepresentative of the priorities and concerns of marginalized groups" (2004:198). In reality, researchers often select participants who are highly relevant to their interests from the ecological-management perspective and take the participants' voices at face value. Even where 'better facilitation' of participation penetrates the reticence or silence of marginalized people in collective fora, what they say in these contexts is necessarily mediated by judgements about what it is politic or desirable to express in public (Mosse, 1994). These narratives are produced for a specific context and need to be analysed as such: their meaning and significance needs

careful interpretation in relation to other kinds of qualitative (and possibly quantitative) data generated using alternative methods (Jackson, 2006). For high quality gender research, participatory methods are simply not enough (Diamond et al., 2003). Research methods that are better at revealing what is 'hidden' are valuable antidotes to participatory and focus group discussion methods. Ethnographic observation, life history research, and open-ended in-depth interviews all allow more space for researchers to build up a much more nuanced account of the workings of gender relations around specific events or processes.

7: Conclusion

Our review of the challenges and opportunities of bringing gender analysis and resilience analysis together in small scale fisheries concluded that there are fundamental constraints to developing a satisfactory unifying framework for gender and resilience analysis. Indeed, "The concerns and questions raised by both resilience scholars and social scientists are, at base, reflections of very old and enduring tensions and debates within and across the natural and social sciences" (Stone-Jovicich, 2015: 25). Despite significant progress and important insights on both sides, two key constraints emerge in existing research that attempts to bridge this divide. Firstly, attempts to integrate gender into resilience analysis are weakly engaged with gender theory or methodology; and secondly, that gender analysis of fisheries has yet to move beyond the social domain to really engage directly with questions of ecology.

Consequently, we have argued that the goal of bringing gender analysis and resilience analysis together need not be a search for a unifying framework but instead could be seen as a quest to deepen inter-disciplinary engagement over social-ecological resilience. In this sense, we very much follow Jovicich's invocation to build 'disciplinary depth', although we depart from her goal of building a 'transdisciplinary synthesis' (Stone-Jovicich, 2015:24), in favour of closer interdisciplinary engagement.

As such, we have argued that it is important that gender research addressing resilience needs to explicitly and deliberately deploy critical social theory. This refocusing means that it is the generation of deeper insights about gender and resilience, and not whether these can be subsumed by 'a' resilience analysis or by 'a' gender analysis, which matters. The desired outcome becomes a much strengthened critical debate over different processes of social-ecological change and their interaction with changing gendered power relations. In this way, the undertaking is about carving out a more plural space for mutually constructive debate.

Such an engagement has the potential to add value to gender analysis and resilience analysis respectively. Gender analysis would be enriched by asking questions about how unequal gender relations are invested in, are challenged by, or are contributing to changing existing social-ecological systems. Resilience analysis would be enriched by asking questions about how experiences, priorities and adaptation capacity in the face of ecological shocks and stressors are shaped by, and in turn shape, gender inequalities. Where gender analysis would gain from analytical tools that focus on complexity, surprise, and adaptation, resilience analysis would gain from an analytic emphasis on tensions, trade-offs, conflicts and ambiguities.

Most importantly, though, bringing critical gender analysis into conversation with resilience analysis has the potential to generate powerful understandings of integrated social and ecological systems. These are not only vital for making progress in enhancing the rigor of social-ecological research but are also valuable in generating a better evidence-base for policy-makers in small scale fisheries and other ecological systems who are faced with increasingly urgent decisions about adapting to climate change.

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