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## Tackling women's vulnerabilities through integrating a gender perspective into disaster risk reduction in the built environment

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### Abstract

The majority of human and direct economic losses from natural hazards occur as a result of damage to the built environment due to the vital role that the built environment performs in serving human endeavours. One of the key reasons for people in developing countries to be more vulnerable to natural disasters than their wealthier counterparts is the limited capacities in their construction industries. Among the people in developing countries, women are evidently even more vulnerable to natural disasters. Due to higher disaster vulnerability of women, recognising the different roles, capacities, vulnerabilities and needs of women, and considering them in disaster risk reduction in the built environment is significant to reduce women's disaster vulnerabilities. Gender mainstreaming as a way of bringing a gender perspective into disaster risk reduction can be applied to recognise the varying needs and capacities of women, and integrate them into disaster risk reduction in the built environment. The paper in this context aims to demonstrate how gender mainstreaming helps to bring a women's perspective into disaster risk reduction in the built environment. It identifies two main steps which involve in the process, identification of women's DRR knowledge and needs, and integration of the identified DRR knowledge and needs into DRR in the built environment. The paper provides an account of the process that the study established to incorporate a gender perspective into disaster risk reduction in the built environment based on a case study conducted in Sri Lanka. It further discusses how the social, economic, political and environmental context influences the process of gender mainstreaming in disaster risk reduction in the built environment

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*Keywords:* Gender mainstreaming; Women's vulnerability; Built environment; Disaster risk reduction; Women natural disasters

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## 1. Introduction

The built environment is a key player in converting a natural hazard to a disaster. The majority of human and direct economic losses from natural hazards occur as a result of damage to the built environment (Max Lock Centre, 2009; Benson and Twigg, 2007). The vital role that the built environment performs in serving human endeavours brings severe disruption to the ability of society to function, economically and socially when its elements are damaged or destroyed by natural hazards (Haigh and Amaratunga, 2010). Thus, the ability of the built environment to withstand the impacts of hazards plays a direct role in determining the casualties and monetary costs of disasters (Ofori, 2002; Mileti, 1999). In particular, the protective characteristics of the built environment are crucial to achieve disaster risk reduction (DRR) (Haigh and Amaratunga, 2010).

Incidentally, disaster records suggest that the effect and impact of natural disasters vary for men and women and women are more likely to die and suffer ill health as a result (Kottegoda, 2011; Ferris, 2010; Alston, 2009; Ariyabandu, 2009; Neumayer and Plümper, 2007; Enarson and Meyreles, 2004). Apart from the higher death toll and more injuries both physical and psychological, it has been observed that women suffer from more socio-economic losses from disasters as well (United Nations, 2009). The extent of disproportionate impairment suffered by women in natural disasters has drawn the attention of researchers to gender in the context of natural disasters. It has been observed that there are biological, social and economic conditions and processes that make women more vulnerable to natural disasters. As a result of the combined effect of these conditions and processes, women possess different gender identities to men which lead to their roles and responsibilities in society, and these identities, roles and responsibilities cause gender based differences in disaster impact (Ariyabandu, 2009; United Nations, 2009; UN/HABITAT, 2004). In particular, women's role as mothers, and primary carers of the elderly, disabled and children performs a uniquely significant role in deciding their disaster vulnerabilities (Enarson and Fordham, 2001; Enarson, 2000). It is stated that some women delayed escaping or, chose to remain in unsafe locations in the face of the incoming waves of 2004 Indian Ocean tsunami due to their role as carers for family members who could not easily be transported such as the sick, the disabled, the elderly and children (Kottegoda, 2011).

In this context, it has been identified that incorporating a women's perspective into DRR in the built environment to minimise the disaster vulnerabilities of women is significant (Ginige et al., 2009). Since the role of the built environment is vital in DRR as explained at the beginning, and its products and processes can support local communities in combating the threat of natural disasters (Amaratunga and Haigh, 2013) addressing the disaster risks of community groups who are more vulnerable to natural disasters is extremely important in DRR. However, how to incorporate a women's perspective to DRR in the built environment is a problem that has not been addressed in past research. The paper in this context attempts to present a solution to the problem based on a doctoral research conducted on mainstreaming women into DRR in the built environment. It aims to explain how the concept of gender mainstreaming could be applied in to the context to incorporate a women's perspective in order to reduce women's disaster vulnerabilities. Gender mainstreaming has been demonstrated as a way of bringing a gender perspective into DRR as it could translate into identifying the different capacities and needs of different gender roles (Gender and Disaster Network, 2009; UNDP, 2004; UN/ISDR, 2002).

In achieving its aim, the paper structures its subsequent content into four main sections to fulfill the following tasks:

- Firstly, to present the methodology employed in the study

- Secondly, to explain the concept and process of gender mainstreaming, and the influence of social, economic, political and environmental context has on the process of gender mainstreaming in DRR in the built environment
- Thirdly, to discuss the process of gender mainstreaming in DRR incorporating the findings of the empirical study
- Finally, to present the conclusions of the paper

## 2. Methodology

The paper is based on a doctoral study which aimed at investigating the process of mainstreaming women into DRR in the built environment. The Research design of the study incorporated a social constructivism view point associating the ontology of constructionism and epistemology of interpretivism. It adopted a case study approach as the strategy of enquiry and the case study design comprised a single case, holistic design, with a single unit of analysis. The unit of analysis was determined as the process of mainstreaming women into DRR in the built environment with a country specific and cross sectional case study boundary in relation to spatial and temporal variables. Further, the study was a mono method research which deployed qualitative, in-depth interviews for its primary data collection strategy. Sri Lanka was selected as the case study for the research; whilst the interview respondents consisted of a group of professionals involved in DRR in the BE of the country.

The single case study was conducted in Sri Lanka in 2011. As mainstreaming gender into DRR in the built environment to incorporate a women's perspective is a context sensitive process linked with the social, economic and political conditions of a particular community, studying a single country context to investigate how to mainstream women was decided as the most appropriate strategy. The significance of the context on the process is explained in the following section of the paper. In addition, developing countries have always exhibited higher disaster vulnerability among women compared to the developed countries. Therefore, it was more appropriate to select a developing country for studying the process of mainstreaming women. Further, women's higher disaster vulnerabilities were visible in Sri Lanka, especially in the 2004 Indian Ocean tsunami, the country's largest natural disaster in the recent history. Statistics indicate that almost 80% of the dead were women in Sri Lanka when the 2004 Indian Ocean tsunami devastated some coastal areas of the country (APWLD, 2005). Considering all the aforementioned factors backed by the easier access to the case study researcher had, Sri Lanka was selected as the case study for the research.

The primary data which was used in this paper was gathered from ten comprehensive interviews conducted as part of the case study. A group of ten professionals engaged in DRR in the built environment in Sri Lanka were interviewed in detail to investigate the ways of mainstreaming women into the process. The composition of the ten respondents were three senior academics from higher education institutes, four experienced practitioners from NGOs and INGOs and three senior officials from the country's DRR related policy making institutions. The analysis of interview data conducted following the principles of thematic analysis in order to build systematic, explanatory accounts from concepts and meanings embedded in the interview responses. Since the study is a single case study research with a context sensitive research problem, the findings of the study are generalizable only to the similar contexts.

In addition to the empirical data gathered from the case study, a comprehensive literature review was undertaken to gain knowledge of the associated concepts pertaining to the research and synthesise the research proposition. The subsequent section which elaborates the concept of gender mainstreaming into DRR and the influence of socio economic context on the process of gender mainstreaming into DRR in the built environment were compiled based on the literature review of the study.

### **3. Gender mainstreaming into DRR in the built environment and the influence of socio economic context on the process**

#### *3.1. Gender mainstreaming in DRR- evolution and definition*

Gender mainstreaming, as a new concept, appeared for the first time in international texts after the United Nations Third World Conference on Women in Nairobi in 1985 (Council of Europe, 1998) and emerged as an important policy strategy that could be employed to address women's disadvantages across the world at the Fourth World Conference on Women, in Beijing in 1995 (Alston, 2009). Although the concept has been defined in different ways by different authors and institutions depending on the environment, the most commonly used definition provided by the United Nations Economic and Social Council defines gender mainstreaming as "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 the concerns and experiences of women as well as men an integral part of the design, implementation, monitoring and evaluation of 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 of mainstreaming is to achieve gender equality." (UN/ECOSOC, 1997, p.2). Accordingly, it was seen as a means of promoting the role of women in the field of development where gender inequality prevailed and of integrating women's values into development work.

Having recognized its potential to attain gender equality, The United Nations Office for Disaster Risk Reduction (UN/ISDR) (2002) identified gender mainstreaming as a way of bringing a gender perspective into DRR. Gender mainstreaming was identified as a way that could translate into identifying the ways in which women and men are positioned in society and their varying disaster vulnerabilities (UN/ISDR, 2002). In the context of DRR, gender mainstreaming is defined by the UN/ISDR as "fostering awareness about gender equity and equality etc., to help reduce the impact of disasters, and to incorporate gender analysis in disaster management, risk reduction and sustainable development, to decrease vulnerability" (Inter-agency Secretariat for the UN/ISDR, 2002, p.3). Hence, it is a process that can be applied to incorporate a women's perspective into DRR because women have been illustrated as more vulnerable to disasters. However, incorporating a women's perspective into DRR is significant not only because they are more vulnerable to disasters but also because they are capable of contributing to DRR through their skills and life experiences (Kottegoda, 2011; Ariyabandu, 2009; Gender and Disaster Network, 2009; UN/ISDR, 2002). It is emphasised that mainstreaming gender into DRR policies and measures not only identifies the needs of different gender roles but the different capacities as well (Gender and Disaster Network, 2009; Kottegoda, 2011; UN/ISDR, 2002).

#### *3.2. Key steps of a process of mainstreaming women into DRR in the built environment*

As illustrated through the aforementioned definitions of gender mainstreaming, it can be applied to the context of DRR in the built environment to identify women's needs and capacities and to decrease their vulnerability. DRR in the built environment is defined in the paper as the concept and practice of reducing disaster risks through systematic efforts to plan, design, construct, maintain and regulate context sensitive buildings, spaces and places, that are least susceptible to natural hazards and have the capacity to minimise the exposure of the society to natural hazards (Ginige et al., 2013). However, it was necessary to investigate the steps which involves in a process of mainstreaming women into DRR in the built environment as it has not been researched or documented previously.

According to European Commission (2004b), the basic feature of mainstreaming is the systematic consideration of the differences between the conditions, situations and needs of women and men in all policies and actions in the relevant environment. The aforementioned definition provided by UN/ISDR for gender mainstreaming in DRR also affirms that the main activity involves in gender mainstreaming is gender analysis that is aimed at decreasing vulnerability. The systematic consideration of the differences of men and women is named as gender analysis in literature. Gender analysis is an exercise which helps to identify where and what kind of inequities may exist between men and women with regard to legal rights, opportunities for personal development, access to productive resources, political participation, etc. (IFAD, 2000). Hence, gender analysis in DRR mainly involves identifying which types of inequities exist between men and women's vulnerability and where they exist.

The main goal of a process of gender mainstreaming is to achieve gender equality (UN/ECOSOC, 1997). Therefore, a process for mainstreaming gender is required to be planned in order to achieve this goal. However, gender equality being the key goal of a strategy for mainstreaming gender; the result which needs to be achieved through the process of gender mainstreaming could sometimes be misinterpreted. Achieving equality is not the simple objective of balancing the statistics of males and females (European Commission, 2004a). As UN/OSAGI (2001a) elaborates, mainstreaming involves more than increasing women's participation, and it is not about adding a "women's component" or a "gender equality component" into an existing activity; "mainstreaming entails bringing the perceptions, experience, knowledge and interests of women, as well as men, to bear on policy-making, planning and decision-making" (UN/OSAGI, 2001b). In DRR, it involves incorporating gender-sensitive strategies and initiatives in disaster management processes, to address both the practical and strategic gender needs of women or men (Umbima, c.2010). Therefore, gender mainstreaming in DRR needs to ensure there are adequate measures in place to address the gender based vulnerabilities identified through gender analysis.

Accordingly, the study deduced that a process for mainstreaming women into DRR in the built environment involves two main steps.

1. Identifying DRR related knowledge and needs of women
2. Integrating the DRR related knowledge and needs of women into the DRR process in the built environment

In the study, women's DRR related knowledge commonly refers to DRR knowledge such as local risks and vulnerabilities, patterns of human settlement and development, locally available resources for disaster mitigation, and also to knowledge developed based on their experiences of their past disasters such as coping mechanisms. DRR needs were defined as the requirements of women which are caused by their disaster vulnerabilities such as resilient housing and infrastructure, and safe evacuation routes. It was regarded that identifying not only DRR needs but also the knowledge which is a form of capacity leads to a comprehensive strategy of mainstreaming as emphasized by DRR scholars and practitioners such as Gender and Disaster Network, 2009; Kottogoda, 2011; and UN/ISDR, 2002.

### *3.3. Influence of social, economic, political and environmental conditions on mainstreaming women into DRR in the built environment*

The preceding section identified two main steps involve in mainstreaming women into DRR in the built environment. However, the process is not a universal practice that can be implemented in any country or place disregarding the contextual variables such as social, economic, cultural and political factors. It is a process which requires endorsement from the policy makers or higher level decision makers to be implemented whilst the extent of recognition it receives as a valid process is significantly dependent on the social, economic, cultural, religious and political environment. For example, incorporating a women's perspective to development may not be considered necessary in certain cultures because of the prevailing male dominance in all sectors of society and at all levels of decision making.

Similarly, the extent of women's disaster vulnerability is linked with social including cultural and religious, economic, and political background of a particular community and frequently determined by the gender identities, role and responsibilities created by a combination of social, economic and political factors. Enarson and Fordham (2001) identify five categories of processes which influence women's disaster vulnerabilities, namely, biological, economic, social, political and environmental processes. All the processes except biological factors vary from one community to another. Although, women are disproportionately affected by disasters all over the world, it is evident that disaster vulnerability is higher among the women who live in communities with greater economic and social constraints (United Nations, 2009; Gender and Disaster Network 2009; Enarson, 2000). Despite the limited availability of gender segregated statistics on disaster impact on women and men (Bradshaw and Fordham, 2013; Fordham et al., 2007), the existing data illustrates that women in developing countries or poorer communities suffer more from natural disasters (Neumayer and Plümper, 2007; Enarson, 2000). 1991 Bangladesh cyclone, 2004 Indian Ocean tsunami, 2005 Pakistan earthquake and 2010 Haiti earthquake provide prolific examples in this context.

Furthermore, the extent of DRR measures integrated within the built environment is governed by the economic development of a particular country. Developing countries experience more human and economic losses from natural disasters than developed countries due to the non-availability of sufficient capacity in their construction

industries (Benson and Twigg, 2007; Ofori, 2002). Further, poor people are more likely to have weakly built houses which are incapable of resisting natural hazards and to live on places which are more exposed to natural hazards resulting in them being more vulnerable to disasters (Ferris, 2010). The best example of the difference between the capacities in the built environment in developed countries and developing countries is the two near identical earthquakes in December 2003 in California and in the city of Bam in Iran. According to the Royal Geographical Society (2004), there were more than 25,000 confirmed deaths in Bam due to the immediate collapse of poorly-constructed multi-storey homes with heavy roofs. In contrast, California reported only three deaths where the population was around 25,000.

Therefore, the extent to which mainstreaming women is required in DRR in the built environment to decrease their disaster vulnerability is decided by the nature of social (including cultural and religious), economic, and political factors of the environment where it is implemented. Clearly, the process of mainstreaming women into DRR in the built environment needs to be understood within a particular social, economic and political context. Therefore, as mentioned in section 2, the study designed its empirical investigation as a single case study based on Sri Lanka. The next section of the paper discusses the process of incorporating a women's perspective to DRR in the built environment based on the findings of the case study. The social, economic and political context of the country is introduced at the beginning of the section in order to draw a more comprehensive picture about the findings.

#### **4. Process of mainstreaming women into DRR in the built environment- Case study of Sri Lanka**

##### *4.1. Social, economic, political and environmental context*

Sri Lanka is an island in the Indian Ocean which is located to the south of the Indian subcontinent. It is one of the most densely populated countries in the world, ranking 19th in the order of high density (Duryog Nivaran, 2009) with a total land area of 65,610 square kilometres inhabited by 20.3 million people (UNDP, 2012). Sri Lanka is a multi-ethnic, multi religious and as a result, a multi-cultural country. Sinhalese are the main ethnic group representing 73.8% of the population whilst nearly 70% are Buddhists in the country. The country's Human Development Index (HDI) positions Sri Lanka at 97th place out of 187 countries and is the highest in South Asia (UNDP, 2012). Although the mainstream culture provides equal opportunities for women, in certain communities, women are more culturally restrained with limited decision making power and inadequate opportunities to voice their needs and knowledge. Further, women in less urban communities are still not encouraged to learn skills like swimming which can help them to survive in disasters like floods. Although there is no overwhelming resistance for women to access education, in poorer families and culturally more restrained communities, women are more disadvantaged in accessing education compared to men.

The country is a developing country with a per capita income of USD 2399 (UNDP, 2012) that has been categorized as lower middle income (The World Bank, 2014). According to The World Bank, Sri Lanka experienced a big decline in poverty from 23 percent to 9 percent of the population between 2002 and 2009. It has also met the Millennium Development Goal (MDG) target of halving extreme poverty and is on track to meet most of the other MDGs (The World Bank, 2014). Following the end of three decades long the civil conflict in May 2009, economic growth inclined due to peace and investment (The World Bank, 2014). Ending of the conflict has opened the possibility of a new period of sustained peace and prosperity. Therefore, mainstreaming DRR into the built environment or incorporating a women's perspective into the process to decrease women's vulnerabilities are not vastly hindered by poverty in Sri Lanka. However, there are problems in the implementation of DRR measures in the country, and mainstreaming DRR into the built environment is still not at a satisfactory level in Sri Lanka. To a certain degree, the financial restrains have hindered the implementation of DRR measures in the built environment but the main reason is lack of awareness about the importance of integrating DRR or the negligence of DRR measures with the intention to accelerate the development projects or to maximize profits.

Sri Lanka is prone to various natural disasters. Natural hazards, particularly climate related hazards are a significant threat to economic and social development of the country. The 2004 tsunami was an eye opener for the country to re-think its disaster management approach. As a result, the Disaster Management Act No. 13 of 2005 was enacted to provide the legal basis for a disaster risk management system in the country. However, there are severe drawbacks in the implementation of the regulatory framework in relation to DRR in the built environment.

Sri Lanka has been pioneering the research on gender and disasters in South Asia (Enarson and Meyreles, 2004). It demonstrates the political, social and cultural freedom women have in achieving equity. However, APWLD (2005) states that the lack of consultation with women and lack of any sensitivity to women's issues and women's multiple roles in rebuilding and sustaining their own families, as well as their communities, were evident in the tsunami rebuilding process. It states that the gender insensitive approach led to many unsustainable reconstruction decisions, for example, the absence of kitchens from many designs for transitional housing. Furthermore, it has been illustrated that the reconstruction of infrastructure in the country took place without due consideration for the specific needs of women; particularly, in the case of the health infrastructure, where easy access is crucial for women (Kottegoda, 2011). Therefore, incorporating a women's perspective to DRR in the built environment is not a process that has been implemented in practice although the research participants recognised the importance.

#### *4.2. Process of mainstreaming women into DRR in the built environment*

A formal mechanism needs to be introduced and established in order to implement mainstreaming women into DRR in the built environment successfully because such mechanism is currently unavailable. The process needs to be enforced by a statute to ensure that it is properly implemented and produces the desired outcomes. The types of development projects on which the process should be followed with clearly defined parties responsible for the different steps in the process needs to be clearly prescribed by the regulations. Conforming to the statutory requirements, the developer/owner of a development project within the built environment needs to bear the responsibility for ensuring that women are mainstreamed in the development. The preferable time scale to identify the DRR knowledge and needs of women is at the initial stages of designing the development project because it provides the flexibility to adjust the plans depending on the information that is received from the process. However, availability of a preliminary design is important at this stage since it facilitates the understanding of the nature and impact of the development more comprehensively.

Identification of the DRR knowledge and needs of women could be conducted by using four main methods namely; directly capturing information through participatory methods, from available literature, via expert views, and through complaints and feedback procedures. Using multiple methods is the most advisable way of identification because it facilitates corroborating one method's findings with the information gained via other methods, especially if the main mode is the participatory method because it produces non-scientific data. However, employing a combination of multiple methods depends on the availability of the information via methods such as expert views and literature, and also on the extent of resources which are required for identification of women's DRR knowledge and needs such as funds, expertise and time. However, The DRR knowledge and needs which are identified need to be evaluated in detail prior to integrating them into the development plans to recognise the most significant requirements to be fulfilled in terms of reducing disaster vulnerabilities.

The next stage for mainstreaming women, i.e. integrating DRR knowledge and needs of women into the development, is inevitably the responsibility of the design team. There are certain factors which could ensure the integration of DRR knowledge and needs such as a regulatory framework that enforces the proper implementation and monitoring of the integration, project documentation of the development that prescribes the integration, and awareness, expertise and commitment of planners and designers in the built environment to mainstreaming women.

## **5. Conclusions**

Due to the vital role the built environment performs in combating natural disasters incorporating a women's perspective to DRR in the built environment is significant to decrease women's higher disaster vulnerabilities. Mainstreaming women into DRR in the built environment to incorporate a women's perspective is a context sensitive process which depend on various factors such as social, economic, political and environmental conditions of a particular community. It involves two main sequential steps as deduced according to the concept of gender mainstreaming and the strategy of gender mainstreaming in DRR. The first step is identifying women's DRR knowledge and needs whilst the next step is integrating the identified needs and knowledge into DRR in the built environment.



The DRR needs and knowledge of women can be identified using one or a combination of four methods, namely; directly capturing information through participatory methods, from available literature, via expert views, and through complaints and feedback procedures. DRR knowledge and needs captured directly from community women need to be carefully evaluated before integrating them into development plans because they are not scientifically validated data. Factors which could ensure the integration of DRR knowledge and needs are regulatory framework that enforces the proper implementation and monitoring of the integration, project documentation of the development that prescribes the integration, and awareness, expertise and commitment of planners and designers in the built environment to mainstreaming women.

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