Gender Dimensions in Geo-spatial Security Research: Disciplinary Confrontations

Clementine Ewokolo Burnley

Nathalie Stephenne

Mercè Agüera Cabo

Follow this and additional works at: https://vc.bridgew.edu/jiws

Part of the Women's Studies Commons

Gender Dimensions in Geo-spatial Security Research:
Disciplinary Confrontations

By Clementine Ewokolo Burnley[1], Nathalie Stephenne[2], Mercè Agüera Cabo[3]

Abstract

Several EU policy papers have called for an improved dialogue between security policymakers, social science researchers and science and technology researchers working on security (Pullinger, 2006). To increase the understanding of gender dimensions in security, the traditional technological response can be complemented by socio-political knowledge. Gender inequities in the socio-economic and political spheres can be analysed by such a comprehensive socio-political and technological approach. In the field of geo-spatial security research, Hyndman (2004) proposes to bridge a gap between gender studies and geographical analysis of security. In this paper, a workshop is used to illustrate both the potential and the difficulties of such a collaborative and interdisciplinary approach. The workshop aim was to define a geographical and spatial analysis of gender dimensions in security. This paper discusses the gender dimensions in geo-spatial analysis, as well as the pros and cons of an interdisciplinary approach. Integrating the overall complexity of gender dimensions as a spatial component in

[1] Clementine Ewokolo Burnley is a computational linguist and policy analyst in the Institute for the Protection and Security of the Citizens (IPSC) of the Joint Research Centre (JRC) of the European Commission (EC), in Italy. After studies of English/Audiovisual Studies at Strathclyde University and Computational Linguistics (M.Sc.) at the University of Manchester Institute of Science and Technology, she worked on research projects at two British universities before joining the JRC. Her current research projects include Conflict Event Data Analysis, Security/ Conflict Risk Assessment, Security Policy Analysis, and Gender and Security.

[2] Nathalie Stephenne is a geographer from the University of Louvain-la-Neuve (UCL), Belgium. In 1995, she completed a Masters in Development Studies in Economical Sciences. Her PhD thesis is entitled Dynamic simulation model to understand land-use change processes in the Sudano-sahelian region (SALU – Sahelian Land Use). In 2000 sh became a prizewinning Laureate of the Académie Royale des Sciences d'Outre-Mer (ARSOM). This foundation published her PhD thesis in 2003. She collaborated with the Centre for Ecology and Hydrology, United Kingdom, to integrate SALU results in Global Circulation Model simulations of climate changes. She worked at University of Brussels, on a Belgian Science Policy funded project. Engaged in the Institute for the Protection and Security of the Citizens (IPSC) of the Joint Research Centre (JRC) of the European Commission (EC) in 2005, she is involved in institutional research activity related to modelling of EU Border Permeability and EU Neighbourhood Stability.

[3] Mercè Agüera Cabo has a degree in Geography from the University of Girona, Spain, and a Postgraduate degree in Cooperation Projects for Local Development from the same university. She then worked as a researcher at the Institute for the Environment of the University of Girona, with a specialization on gender studies on the environment. She has been a researcher in the Knowledge Methodologies Sector (KAM) of the Institute for the Protection and Security of the Citizens (IPSC) of the Joint Research Centre (JRC) of the European Commission (EC), in Italy. The main scope of her research was to investigate how theoretical contributions from feminist and gender studies on the environment can be applied to environmental decision-making in the context of inclusive participatory processes. Her field research consists on the gender analysis of grassroots organisations for environmental conflicts in Catalonia, Spain. Merce was also involved in the coordination and management of the Worldwide Network Interfaces: Between Science and Society. Currently, she is professor in Human Geography at the University of Girona, where she is also involved in formulating the Gender Equity Plan for the institution

security monitoring is a promising challenge, but is still to be achieved by the technological community. This paper explains the epistemological and methodological issues and opportunities of this dialogue.

Keywords: Security research, Security concepts, gender dimensions, geo-spatial technology, interdisciplinarity

Introduction

Several important policy papers on security research have called for an improved dialogue between security policymakers, social science researchers and science and technology researchers working on security. Such dialogue is envisaged for a timely research response to global security challenges and security research policy demands (Pullinger 2006, European Commission 2004, European Parliament Foreign Affairs Committee 2005).

This paper illustrates both the potential and the difficulties of improving the dialogue between socio-political scientists and technological scientists in order to create a common understanding of gender dimensions of security.   It is a challenge to integrate the overall complexity of the gender dimension as a geo-spatial component in security monitoring. This challenge requires that the technological community understand the gender dimensions in security. A common understanding cannot be achieved without a real dialogue between communities.

Our sociopolitical and technological analysis takes as case study of this dialogue the experience of a workshop on Gender and Security. The workshop was organized by the Global Monitoring of Security and Stability Network of Excellence (GMOSS). GMOSS is funded by the European Commission (EC). The workshop brought together two communities of scientists: GMOSS technological scientists using Earth Observation (EO) data and socio-political scientists specialized in gender studies. The socio-political scientists were expected to define the gender dimensions of common security issues. GMOSS technological scientists were expected to introduce gender dimensions in their technological and geospatial analysis of security. The ideal result would have been integration of socio-political concepts in EO applications and technologies.

The expected dialogue was based on the concept of demand and supply driven work flow between socio-political and technological scientists in the GMOSS Network of Excellence. This concept was adapted to gender studies for the workshop (see Fig. 1). On one side, socio-political scientists had to analyze policy demands and threat scenarios to transmit decision makers' needs to technological scientists. On the other side of the flow, the existing technologies of geographical information systems and earth observation had to address socio-political questions.

Figure 1: Hypothetical Workflow between technological and socio-political research in security monitoring and the integration of a gender dimension
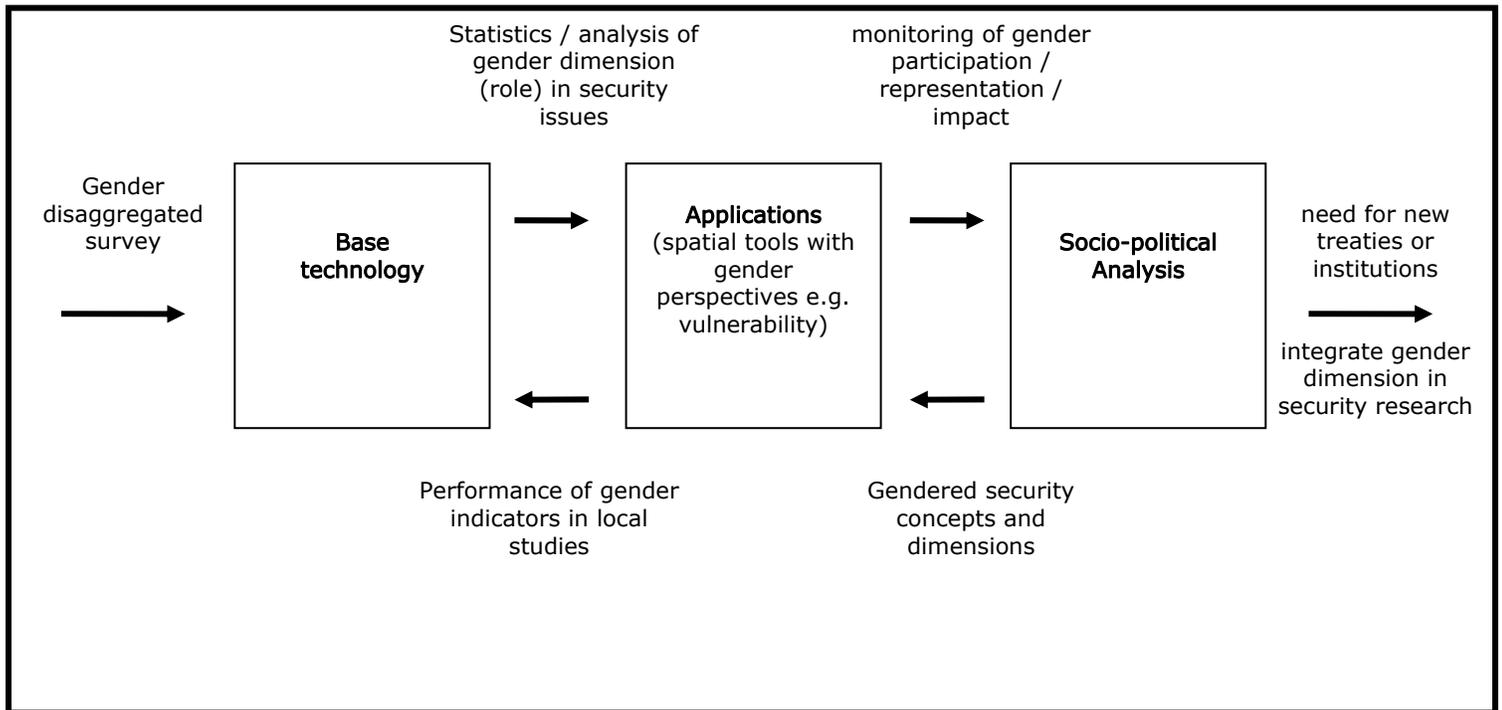
To foster the dialogue, four questions were asked to both communities during the workshop. Focusing progressively from definitions of security to the quantitative analysis of the gender dimensions in security, the four questions were: (i) what can be a general but gendered definition of security, (ii) what is the gender dimension in security, (iii) how do we measure the gender dimension in security, (iv) what is the geospatial translation of these measures. While the two first questions were addressed by the gender specialists, no consensus was reached on the last two questions.

In Section 2 the paper summarizes existing security definitions from socio-political literature to provide basic concepts for a gendered definition of security. In Section 3 it reviews Gender studies and International Relations literature in order to describe the complex roles, participations and actions of women and men at different levels of analysis and in different contexts. In Section 4, the paper discusses the confrontation between the two communities of researchers and the communication difficulties they faced. It juxtaposes the opposing research traditions. Finally the paper describes goal-oriented, methodology and epistemology-based differences between the two approaches and mentions some practical strategies for introducing gender in security geospatial research.

Definitions of Security

A wide body of literature has developed around the concept of security. It has commonly been defined in relative terms by reference to an object at risk, threats to that object and measures which may be taken to safeguard the object. Security definitions, then, are context-dependent and non-absolute (Booth 1990, Garnett 1996, Buzan et al.

1998). Two main schools of thought in international relations are distinguished. These schools are realism and critical security studies.

There is continuous evolution in usage of the word "security". Issues become "securitized" where societies define them as posing an existential threat to survival of a society in its current state (Walker 1997). Defining an issue as a threat to survival is seen by some as a political strategy (Ullman 1983). However, defining issues as survival threats carries certain dangers. One danger is to limit the range of response options to military defence, the other is to overstretch the security concept and empty it of meaning (Walt 1991, Wyn-Jones 1999).

Realist Definition : State Security

Realist security concepts were framed by the Cold War. The object at risk was automatically the state, which was also the primary international actor. The exclusive and primary responsibility of the state was the protection by military means of state borders, territory and citizens. The main threat to states was interstate conflict. The interests of states were presumed to be the interests of the individuals and communities they contained. Maximization of power was seen as the best defense for states against the "other" beyond the state border (Morgenthau 1948, Lynn-Jones and Miller 1995). However, post-structuralist and other theorists (including neorealists) have challenged the realist view of violent conflict as natural and inevitable. These theorists see interdependence and international collaboration as both needed and possible (Buzan et al. 1991, Sample 2000, Vasquez 2000, Raymond 2000).

Changes in Definition : Human Security

The Post-Cold War era has witnessed a shift in focus from security of the state conceived in terms of power, autonomy, territorial integrity and sovereignty, to one which relies on concepts of universal, indivisible, interdependent human rights. These rights are recognized and protected by international law enforced by states and international institutions. According to the United Nations (UN) human security is defined as freedom from fear, wars and pervasive threats to people's right, safety and lives (UN Development Programme 1994). This definition is mainstreamed at international level in the United Nation organizations and is finding acceptance within the security policymaking community.

Existing threats such as internal conflicts, nuclear proliferation, terrorism and organized crime have acquired new urgency due to growing trans-national linkages. Such threats can disrupt critical systems for modern economies, like communication, transport and energy. Shared threats to states and to the global environment (Matthews 1989) combined with a greater focus on people and their needs have led to a shift in conceptualization of security. Security is now increasingly thought of as multi-scale and inter-dependent. Security is also thought to require multilevel cooperation by states, international institutions like the UN and regional organizations like the EU and Organization for Security and European (OSCE). In this approach reducing threats to other states leads to greater common security.

The International Commission on Intervention and State Sovereignty (ICISS) introduced the concept of "the responsibility to protect". This responsibility can shift from an incapable or unwilling state to the wider international community. In the recent

past in Bosnia, Kosovo and Macedonia state sovereignty was judged less important than the well-being of individuals and communities inside state borders, resulting in multilaterally organized armed interventions.

The human security concept envisages using the full range of non-military as well as military instruments in dealing with threats that require international collaboration. The human security approach can be distinguished by its focus on addressing structural causes of security threats like conflict, by building institutional, civil and state capacity and by fostering equitable economic development. While states remain the primary international actors, civil society and non state-institutional actors are establishing a stronger role. In this view state security capabilities are seen to have increased through improvements in the scientific knowledge base, in technology, and in political coordination. Ecosystem protection agreements like the Kyoto protocol are an example of collaborative responses to global threats.

Gender and Security

Within the realist security concept, since the object at risk is the state and the interests of individuals are collapsed into those of the state, gender issues are ostensibly irrelevant. The difference in interests and situations, of women and men is broadly assumed to be insignificant. The human security concept focuses on individuals. It identifies women and children as extremely vulnerable to all types of security threats. Gender discrimination and gender equity are well recognized dimensions of human security. The human security definition can be used as a definition of security in a gender mainstreaming process in security research.

Human Security and Human Equality– Gender Studies Approach

Both women and men experience wars and natural disasters as a devastating trauma. but the social roles of men and women are different. There are gender differences in cultural, political and social influence held in the stages pre-conflict/disaster, ongoing conflict/disaster, conflict/disaster response. The understanding of root causes at each of these stages is a necessary condition to build a technological geospatial model of gender dimension. Such an understanding can direct future actions by national and international actors.

Gender Roles in Conflict and Post-conflict Situations

The gender studies approach uses the gender perspective to reveal significant differences in the actual situations of men and women both during peacetime and during conflict. These differences are attributed to a patriarchal structure and to an economic weakening of women by their primary child-care role (Enloe 1993, Tickner 1992). Patriarchy is here defined as the system of social and culturally determined structures that institutionalize male physical, social and economic power over women (Reeves and Baden 2000). Force use to gain power and autonomy is said to coincide with a set of social values associated with a specific type of masculinity – aggressive, dominant masculinity (Tickner 1992).

In the social construction of gender roles, stereotypically "feminine" qualities such as nurturing, emotion, intuition are negatively opposed to "masculine" qualities such as strength, rationality, and logic. The usual female responsibility for the care, welfare

and survival of the family gives women an important role in conflict and also in reconstruction (Reimann 2001). The view of gender roles as active, on-going social constructions which vary across time and cultures means that gender roles can be challenged. By destroying the existing socio-political structure, conflicts or natural disaster can provide new roles to both genders. The gender studies approach makes a link between patriarchy and violence at all levels between the home and the field of international conflict. However, it is not at all established as fact that women are naturally more peaceful than men (ICRC 2001, Turshen and Twagiramariya 1998, Goldstein 2001). This gender studies approach proposes a spatial multi-scale approach to analyzing power relations (Wastl-Walter and Staeheli 2004) that is a particularly interesting dimension to address through a geospatial modeling approach.

Conflict and Natural Disasters: Different Gender Impacts

Gender is also relevant when we come to analyze the impact of conflict and natural disasters. There are stark imbalances in the proportions of men and women suffering from gender based violence (forms of violence specifically and largely directed towards women). But in general there is a lack of reliable quantitative data on war casualties. It is difficult to distinguish between civilian and combatant casualties and to distinguish by gender. During times of conflict and post conflict, many women are subject to sexual violence, humiliation, rape, forced prostitution and unwanted pregnancy (UN Commission on the Status of Women 1998, Vlachova and Biason 2005). This situation is recognized and addressed in international human rights law. Civilian casualties -mostly women and children- now approach or outnumber combatant casualties in recent conflicts (Human Security Report, 2005). Neumayer and Plumper (2006a) find a stronger effect of conflict on life expectancy for women, especially in ethnic civil wars.

In the case of natural disasters a priori direct impacts such as mortality had been assumed to be gender neutral. This assumption is now questioned by new quantitative studies (Neumayer and Plumper 2006b, UNFPA/WCS/Oxfam 2005, O'Hare 2001). An extensive body of case study literature now exists on gender-specific disaster mortality and some quantitative data has been collected. In some case studies natural disasters have been seen to have different impacts on men and women. Hartmann (2006) illustrated how the 1992 cyclone in Bangladesh heavily impacted women.Due to cultural restrictions on their mobility did not see early warnings posted in public spaces to which they did not have access, and delayed leaving their homes. Post-disaster, in addition to physical and psychological impacts, widows usually remain alone as heads of household. In the 2005 Indian Ocean Tsunami, Oxfam analyzed the gender impact of the disaster using the numbers of killed and injured people. On assessment, lower casualties among men turned out to be linked to their occupation as fishermen and their position on the ocean at the time of the disaster. After the disaster the high casualties among women meant a heavy care-taking role for adult men and the surviving girl children, who became marriage partners much earlier than pre-disaster (Oxfam International 2005).

People's vulnerability to environmental stresses and to natural disasters is affected by their different roles in society. People's vulnerability is also affected by differential access to resources such as food, healthcare, information, markets.. The effects of war on women and men are influenced by the position of the woman or man in the conflict

(Lindsey 2001). The same argument could be made in the case of natural disaster. This gender vulnerability at the time of the disaster/conflict has an unarguable spatial component that could be integrated and studied by new geographical technologies.

Geospatial and Technological Monitoring of Gender Dimensions of Security

Our analysis of security concepts from the gender viewpoint reveals specific security needs of women and men directly linked to social gender roles. The geospatial perspective may thus be applied to identify vulnerabilities specifically attributable to gender in conflict/disaster situations - in the different roles, levels of decision, stage of conflict and spatial scales-. The gender perspective brings a new dimension into security models that have to be integrated in geo-spatial tools.

The dramatic progress of the Information Technology (IT) industry and internet over the last 30 years has led to the success of Geographical Information Systems (GIS) (Stephenne, 2006). A GIS is an information system which describes the physical location of people and resources in the real world. The advantage of a GIS is its ability to integrate disparate data sets together by specific techniques like spatial searching and overlay. Various data such as maps, census lists, and remote sensing images are converted into a digital format. Since the essence of GIS is its heterogeneous and multidisciplinary character, this tool could be particularly useful in the dialogue between different scientific communities. However, this technology and discipline is specific to traditional science domains like land use, urban planning, transportation and environmental studies (Longley at al 1999).

The antagonisms between scientists and social scientists sometimes called "Science wars" have been particularly important in critical geographical information system papers (Schuurman 2000, Kwan 2002). The discovery of GIS by social scientists resulted mainly in deconstruction and critiques about the technique of virtual space of problematic data manipulation (Pickles 1995). Sociologists point to the relationship between GIS and power because of its uses as "instrument of policy making", its positivism or the undermining of privacy (Curry 1999). Women and minorities have been excluded in the formulation and experimentation of GIS projects (Kwan 2002). While epistemological arguments have often been without grounding in the practice of the tool, feminists propose constructive critiques that "care" about the subject (Schuurman and Pratt 2002). For these feminist studies, GIS is not a neutral tool and involves a legitimacy accepted as "truth". This tool can be used to shift the power dynamics in participatory approaches (Gilbert and Masucci 2005). .

The Sustainable Livelihood Approach (SLA) is now adopted by a lot of field organizations as a conceptual model to better understand and manage population vulnerability (Hussein 2002). Livelihoods are the means by which households obtain and maintain access to the resources necessary to ensure their immediate and long-term survival. Households use these assets to decrease their vulnerability, in other words to increase their ability to withstand shocks and to manage risks that threaten their well-being. The gender dimension is part of the livelihood concept. This approach is also consistent with research and experience demonstrating that the causes of vulnerability are place based and context specific (Stephen and Downing 2001). In some local case studies, FEWS Net and Save the Children UK have already introduced the livelihood

approach into a GIS to better understand the spatial dimension. Whatever their usefulness, these geo-spatial tools do not integrate most of the complexity of the gender dimension (Hussein 2002). This integration is a challenging but quite promising avenue of research.

Gender Researchers and Geospatial Technicians: Unfeasible Partnership?

As mentioned previously, a crucial impediment for providing a gender dimension to geospatial security tools is the lack of sex-disaggregated data on specific aspects (e.g. number of casualties by sex), as well as the lack of consideration of specific quantitative data that may inform about the situation of women (e.g. number of widows after a natural disaster). In that sense, an important challenge for introducing gender in security geospatial modeling is to invest scientific and economic resources to remedy that lack of information.

Many of the concepts and interpretations provided by gender studies have a difficult translation to geospatial tools. They may require incommensurable information that relates to multiple and diverse factors. In that case complexity cannot be reduced to a simple variable (e.g. influence of masculine values in power structures and their impact in maintaining gender inequities). Work has still to be done to create a common understanding between gender researchers and geospatial technicians. Unfortunately, the workshop illustrated that these technical issues are not the only reasons for mis-communication between these communities.

The Source of the Incomprehension: a (Mis)dialogue Between Different Scientific Views: Fundamental Differences

Our analysis of disciplinary miscommunication is based on the idea that each research community exemplifies a different scientific view, which holds differing fundamental assumptions. These assumptions were unfortunately neglected in the workshop preparation. The understanding of their different assumptions is seen as a necessary condition for an improved dialogue between the two communities.

Table 1 presents the goals, epistemological references and methodological approaches of both communities. The geospatial modeling goal is opposed to the gender studies context-setting goal. Gender researchers emphasize the relevance of gender variables for interpreting security issues (e.g. gender vulnerability), and the relevance of gender as a dimension of security itself (e.g. gender imbalances in decision-making at all scales). Both groups of researchers wish to influence security decision-makers. In contrast to geospatial researchers, gender studies researchers are not included in mainstream research on security for the purpose of providing policy-making advice.

The epistemological reference of spatial analysis is modern science (Tarnas 1991), fully embodied by natural and applied sciences (i.e. "hard" sciences1). The separation between researcher and object of study is prescriptive, to guarantee the rigor and veracity of results. The epistemological framework of gender studies is that of the humanities (i.e. "soft" sciences). Knowledge is seen as a partial representation of the world biased by the researcher's hopes, needs and assumptions and embedded in a social and historically conditioned position (Denzin and Lincoln 2003).

The geospatial methodological approach is mainly quantitative with a strong adherence to positivism (Hickey and Lawson 2005). Geospatial technicians are used to

working with computer based tools driven by large amount of data, particularly satellite images or quantitative and georeferenced datasets.

	Geospatial analysis approach	Gender studies approach
Goal	Provide models for supporting security policy making: focus on control and prediction	Bring a gender dimension to security: focus on justice (equity, vulnerability and representation)
Epistemological reference	Natural and Applied Sciences (modern science) : universalism and generalization , research/study hyper-separation (neutrality, and objectivity); provide models of reality (simplification and commensurability)	Humanities: complexity, integration of subjectivity, incommensurability, focus on historical and socio-cultural contextual variations
Methodological approach and data uses	Positivism Quantitative methods (modeling, quantitative datasets and satellite images)	Influence of the postmodernist paradigm Mainly qualitative (oral methods, participant observation and text analysis) Eventually quantitative data (problems of availability)

Table 1: Differences between the geospatial and gender studies scientific approaches

A priori gender studies may use quantitative (measurable and large-scale), qualitative data (e.g. in-depth interviews) or mixed methods. Specific weaknesses of gender analysis are the lack of available sex-disaggregated statistics (McDowell 1992). This lack of statistical data has led many researchers to make use of qualitative methodologies. Feminist researchers argue that quantitative methods assume "facts" speak for themselves, and that positivistic techniques only bring a "truthful", "objective" and "neutral" account of reality (England 2006). For some feminist scholars science is always context dependent (situated position) (Harding 1991 and 2004, Hartsock 1998, Haraway 1988). In addition, the complex nature of gender problems and the interest of feminists in deconstructing the taken-for-granted assumptions (Olesen 2003) call for qualitative methods of analysis. They may consist in oral methods (e.g. in-depth interviews), participant observation and textual analysis (e.g. analysis of print media) (England 2006).

As a result of these differences, gender speakers at the workshop could not provide a robust positivistic approach to gender and security that could be used by the

geospatial scientists to establish their quantitative and spatial models. Instead, the gender researchers argued quantitative data was not enough to understand gender relations in security, and they were concerned by the increasing detachment of geospatial researchers from real problems in which field gender practitioners (NGOS's, among others), are daily involved. Qualitative data is context-dependent and many times immeasurable. The strong political dimension and the attention to local specificity (rather than commonalities) of gender studies fails the strong basis of universalism.

Moreover, the audience of geospatial scientists could not see the scientific relevance and the technological translation of gender analysis, a social discipline on security which deals -at its core- with social, political, ethical and economic concepts and in which qualitative analysis is given priority. Security itself is a political arena, and research on security is irremediably embedded in policy choices. The conceptual change in security paradigm from state security to the more holistic idea of human security permitted a gender dimension in security. That conceptual shift is both a political and a scientific mutation. This political change in the security conception should induce a change toward a more holistic and multi-level approach in the focus of security research. Indeed, the availability of data on a specific topic is dependent on specific interests. Gender information shows gender inequities and oppression; this information has not being given priority. The focus on quantitative data also implicitly obscures the relevance of a gender dimension in security because, as we saw previously, gender power relations and inequities often require qualitative research approaches.

Finally, security geospatial research embodies scientific assumptions of control and domination embedded in the Western hegemonic hierarchical relation between society and the environment. Gender marks are relevant to that modern epistemology (Schiebinger 1997). Ethno-androcentric hegemony in Western culture is implicit in the reasoning of Enlightenment pioneers (such as Descartes, Locke (Fox Keller 1992, Merchant 1983) or Boyle (Potter 2001)) who encouraged the scientific endeavor of penetrating, controlling and dominating nature. The pre-modern image of Nature as nurturing mother prevented human exploitation of the environment. The Scientific Revolution undermined the idea of nature as mother, leaving the room to the view of nature as a lifeless machine which (male) scientists could discompose in simple parts and analyze. A second image of Nature which also dominated in pre-modern times was of a wild and uncontrollable female entity bringing chaos and disasters to humans (e.g. through storms that destroyed crops and caused illnesses). This reinforced the idea of gaining control over the environment for social security and development underpinning the direction science and technology would take (Merchant 1983, 1996).

Gender in Technology-oriented Research Communities: Complementarities and Constructive Suggestions

After having shown differences and contradictions between the two communities, we would like to discuss commonalities and potential collaborations between them.

An Invitation to Complementarity

While technological disciplines dominate scientific research for policy making, good communication will continue to be essential for gender researchers aiming at penetrating security decision-making. Geospatial researchers can also help to

communicate the need for quantitative data in gender studies. While gender remains a fundamental aspect of our societies, a variable and a dimension of security analysis, it will continue to be important for geospatial scientists to introduce a gender outlook in technological tools.

The two communities can complement each other in a broader goal of interpreting the security issue better (i.e. more equally and efficiently). Both can contribute to the decision making process. However this complementarity is only possible if some epistemological proximity is developed. Technological scientists should initiate a reflection about the limitations and value-loads of their own epistemological approach, which could lead to a better comprehension of gender studies contributions. Gender scientists' views could become less hermetic by exploring how to make their own approach more relevant to geospatial scientists.

Practice-oriented Proposals

The following lines suggest practice-oriented potential strategies for geospatial joint products.

Qualitative and Quantitative Data

The specific challenge in introducing a gender perspective within geospatial tools is to develop precisely geolocated and gender disaggregated data on impact of conflicts/natural disasters; baseline economic data, baseline development data, and coping strategies. For instance, in an analysis of violent conflict including a gender insight, a starting point could be (i) to examine differential gender impacts, using disaggregated data for instance on conflict/disaster mortality and displacement; (ii) to better understand the link between political participation, socio-economic status and coping strategies at different social scales; (iii) to communicate insights to response actors.

Research support of both communities is critical to explore and determine which geospatial variables (gender equity in decision-making bodies, new coping capacities,…) may give indications about gender inequities in security. Such patterns could be tested through statistical analysis, e.g. could we find a correlation between gender equity at different decision making scales and regional or country stability?

However, valid information especially on conflict cannot be collected exclusively via quantitative methods. Qualitative methods are required to understand the reality of conflict processes (incentives of actors, rules and institutions, political, social and economic framework conditions). This is best done by combining information on contextual factors influencing conflict processes with in-depth case studies.

Spatial Data as a Communication Tool

Challenging the traditional use of geospatial products as tools in control and foresight, satellite images and geo-spatial tools can be used as a means of communication between political representatives at different scales. A well established field in development research deals with the use of remote sensing products as means for communication to foster participation of local people in decision making processes (Chambers 1989). Satellite imagery and digital elevation models (DEM) were used

during the negotiations for the delineation of the international border between Bosnia and Herzegovina and Serbia (Wood and Smith 1997). Remote sensing products at very high resolution images have been proposed as a participatory tool in local planning support for example in a slum upgrading program in Addis Ababa (Lemma et al. 2005). Maps are also used in political consultation processes (Rekacewicz 2006). With that orientation, geospatial products could be used by local, national and international actors as a tool to promote gender balanced local participation in decision-making. They may also contribute in conflict prevention, mediation and/or reconstruction.

Geospatial Decision Support System

Geospatial analysis is a mainstream perspective in security research, but it has been mainly male-centered. This study identifies that vulnerabilities are specifically attributable to gender in different roles, levels of decision, stages of conflict and spatial scales and on the conflict/disaster impacts. Technological models and tools have to integrate these gender dimensions. Recently, Brown (2003) made a gendered spatial analysis of socioeconomic issues in the technological model of population vulnerability. This study is a promising attempt to integrate gender-disaggregated resource-use field survey in a homogenous GIS to better understand spatial gendered patterns of resource accessibility. However, more resources should be invested from both communities.

Geospatial Participative Decision Support System

A decision support system integrating the alternative scenarios and political measures of the different disciplinary communities is a promising research challenge in geospatial tools. Communication and participation in the decision-making process should be extended to all relevant actors in security problems. By relevant actors we mean those engaged in or affected by the decision making process, which could include policy makers and scientific experts, and local agents (e.g. NGOs, local authorities, local community). Extended participation may provide the deliberative and reflexive environment needed to discuss gender studies insights to security.

Our suggestion is to use a participatory process inspired by Funtowicz and Ravetz (1994) in the idea of Post-Normal Science for the establishment of the interests (problem framing) and relevant components of the geospatial technological model. The importance of reflexive processes in the extended assessment of the scientific inputs in controversial issues such as environmental health risks has been reported by Craye et al. (2005). Security problems may include multiple and potentially opposed value frameworks, in which science deals with high uncertainties (e.g. unavailable data, to cope with qualitative information, etc.), and in which the decisions are politically and publicly sensitive and need to be addressed urgently. With these characteristics the research path marked by Postnormal Science might lead to new, promising approaches.

As a theoretical example, a gender-sensitive security model of a specific geographic context that would use geo-spatial tools and earth observation images would require: (i) to take into account the gender dimension in the spatial components by using gender disaggregated data (e.g., female heads of household), (ii) to investigate and incorporate data that may explain local gender patters (e.g., gendered distribution of land uses in agriculture using land cover on satellite images), (iii) to study the appropriate scale(s) or resolution of the gender dimension (family, household, community, state and

international), (iv) to interact with decision makers for the communication of the model components.

Conclusions: Extended Participation in Security Research and Decision-making

This paper has examined existing security concepts in order to integrate a gender dimension drawn from gender studies theory in the specific field of the geospatial security research. It finds that a gendered definition of security cannot be located within the realist school of thought in International Relations but should instead be found within a holistic and multi-level approach such as the human security approach. We demonstrated that gender inequities in social roles and decision-making, violence inflicted on women and gender-based impacts of natural disasters are fundamental and intrinsically spatial aspects of security problems. Integration of this dimension into technological tools has a high research potential.

Following our main interest of exploring the introduction of a gender perspective into security research, the last part of the paper has focused on the potentialities and benefits of an interdisciplinary dialogue between gender scholars and geospatial scientists dealing with security issues. We have pointed to differences in goals, epistemological foundations and methodological practices which create a significant gap between the two communities. Each community should be aware of these differences and work to toward each other to have a real dialogue. However, our analysis has aimed at providing exploratory paths for promoting mutual understanding between the two research areas to provide a more complete and complex (holistic), qualitative, efficient and democratic account of security problems.

Although our position throughout the article has been that communication, mutual learning and cooperation between geospatial analysis and gender research is desirable, their goals, epistemological and methodological different positions are contradictory in their current state. We invited geospatial technological and gender researcher scientists to engage in epistemological reflection. But we must perhaps exclude to think of consensus as normative and instead think of the different functions of the two communities in assessing the multiple aspects of the security problem. Both types of knowledge may be relevant in different ways to the project of supporting the decision-making process in the field of security.

Finally, we would like to conclude the paper by bringing the ideas of communication and participation forward, and to focus on them to suggest more participative research for a gender dimension in geospatial security research.

References :

Booth K. (1990), European Security - The New Agenda, Saferworld Foundation, Bristol.

Brown S. (2003), Spatial Analysis of Socioeconomic Issues:gender and GIS in Nepal. Mountain Research and Development 23, 4, 338-344.

Buzan B., Wæver O. and De Wilde J. (1991), People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era, Harvester Wheatsheaf, New York.

Buzan B., Wæver O. and Wilde J. D. (1998), Security: A New Framework for Analysis, Lynne Reinner Publishers, London.

Chambers R. (1989), Vulnerability, Coping and Policy. IDS Bulletin 20, 2, 1-7.

Craye M., Funtowicz S. and Sluijs J. V. D. (2005), A reflexive approach to dealing with uncertainties in environmental health risk science and policy. International Journal of Risk Assessment and Management 5, 2/3/4.

Curry M. R. (1999) Rethinking privacy in a geocoded world, In Longley P., Michael Goodchild, Maguire D. and Rhind D. (Eds), Geographical Information Systems, pp. 757-766. John Wiley and sons, New York.

Denzin K. N. and Lincoln Y. (2003), Collecting and interpreting qualitative materials, Sage, London/New Delhi.

England K. (2006) Producing Feminist Geographies: Theories, Methodologies and Research Strategies, In Aitcken S. and Valentine G. (Eds), Approaches to Human Geography, pp. 286-297. Sage, London.

Enloe C. (1993), The Morning After: Sexual Politics at the End of the Cold War, University of California Press.

European Commission (2004), Security Research: The Next Steps: Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the regions, European Commission, Comm 2004 590.

European Parliament Foreign Affairs Committee (2005), Report on Security Research - The Next Steps, European Parliament, A6-0103/2005.

Fox Keller E. (1992), Secrets of Life, Secrets of Death. Essays on Language, Gender and Science, Routledge, London & New York.

Funtowicz S. O. and Ravetz J. R. (1994), Uncertainty, Complexity and Post-normal Science. Environmental Toxicology and Chemistry 13, 12, 1881-1885.

Garnett J. C. (1996) European Security After the Cold War, In Davis J. M. (Eds), Security Issues in the Post-Cold War World, pp. 12-39. Edward Elgar, Cheltenham, UK.

Gilbert. M. and Masucci M. (2005), Research Directions for Information and Communication Technology and Society in Geography. Geoforum 36, 2, 277-279.

Goldstein J. S. (2001), War and Gender: How Gender Shapes the War System and Vice Versa, Cambridge University Press

Haraway D. (1988), Situated knowledge. The science question in feminism and the privilege of partial perspective. Feminist Studies 14, 575-599.

Harding S. (1991), Whose Science? Whose Knowledge? Thinking from women's lives, Cornell University Press, US.

Harding S. E. (2004), The Feminist Standpoint Theory Reader. Intellectual & Political Controversies, Routledge, New York & London.

Hartmann B. (2006), Gender, Militarism and Climate Change, WRM Bulletin, Issue June 2006, Access on 11/04/2008 at www.wrm.org.uy.

Hartsock N. (1998), The feminist standpoint revisited and other essays, Westview Press, US.

Hickey M. and Lawson V. (2005) Beyond Science? Human Geography, Interpretation and Critique, In Castree N., Rogers A. and Sherman D. (Eds), Questioning Geography, pp. 96-114. Blackwell, India.

Human Security Report 2005: War and Peace in the 21st Century Human Security Centre, Access on 11/04/2008 at www.humansecurityreport.info

Hussein K. (2002), Livelihoods Approaches Compared: A Multi-Agency Review of Current Practice, DFID / ODI,, pp. 59, http://portals.wdi.wur.nl/files/docs/ppme/Comparing_SLAs.pdf.

Hyndman J. (2004), Mind the gap: bridging feminist and political geography through geopolitics. Political Geography 23, 307-322.

ICRC (2001), The Responsibility to Protect: Report of the International Commission on Intervention and State Sovereignty, International Development Research Centre, Ottawa.

Kwan M.-P. (2002), Is GIS for Women? Reflections on the critical discourse in the 1990s. Gender, Place & Culture 9, 3, 271 - 279.

Lemma T., SLIUZAS R. and KUFFER M. (2005) In Mapping for change : International conference on participatory spatial information management and communication, PGIS '05 (Eds), Nairobi, Kenya, College of Communication Technology (KCCT).

Lindsey C. (2001), Women Facing War: ICRC Study On The Impact Of Armed Conflict On Women, ICRC, Geneva, pp. 14-15.

Longley P., Goodchild M., Maguire D. and Rhind D. (1999) Introduction, In Longley P., Michael Goodchild, Maguire D. and Rhind D. (Eds), Geographical Information Systems, pp. 1-20. John Wiley and sons, New York.

Lynn-Jones S. M. and Miller S. E. (Eds.) (1995) Global Dangers: Changing Dimensions of International Security, MIT Press, Cambridge, MA.

Mathews J. (1989), 'Redefining Security'. Foreign Affairs 68, 2, 162-177.

Mcdowell L. (1992), Doing gender: feminism, feminists and research methods in human geography. Transactions Institute of British Geographers 17, 4, 399-416.

Merchant C. (1983), The Death of Nature. Women, Ecology and the Scientific Revolution, HarperCollins, New York.

Merchant C. (1996), Earthcare. Women and the Environment, Routledge, London & New York.

MorgenthaU H. (1948), Politics Among Nations: The Struggle for Power and Peace, Alfred A. Knopf, New York.

Neumayer E. and Plumper T. (2006a), The Unequal Burden of War: On the Effect of Conflicts on the Gender Gap in Life Expectancy. International Organization 60, 3.

Neumayer E. and Plümper T. (2006b), The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002. Royal Geographical Society (forthcoming).

O'Hare G. (2001), Hurricane 07B in the Godavari Delta, Andhra Pradesh, India: vulnerability, mitigation and the spatial impact. Geographical Journal 167, 1, 23-38.

Olesen V. L. (2003) Feminist and Qualitative Research at and Into the Millenium, In Denzin N. K. A. L. Y. S. (Eds), The Landscape of Qualitative Research. Theories and Issues, pp. 253-291. Sage, London/New Delhi.

Oxfam International (2005), The tsunami's impact on women, Oxfam International, Briefing Note, Oxford, http://www.oxfam.org.uk/what_we_do/issues/conflict_disasters/bn_tsunami_women.htm.

Pickles J. (Ed.) (1995) Ground Truth: The Social Implications of Geographic Information Systems, The Guilford Press, New York.

Potter E. (2001), Gender and Boyle's Law of Gases, Indiana University Press, Bloomington.

Pullinger S. S. (2006), EU Research and Innovation Policy and the Future of the CFSP, ISIS Europe.

Raymond G. A. (2000) International Norms: Normative Orders and Peace., In Vasquez J. A. (Eds), What Do We Know About War, pp. pp. 281 -297.

Reeves H. and Baden S. (2000), Gender and Development: Concepts and Definitions, Report, Bridge IDS, access on 14/11 in 2006.

Reimann C. (2001), Engendering the Field of Conflict Management; Why Gender Does Not Matter! Thoughts from a Theoretical Perspective, Peace Studies Papers, no. 2.2, Fourth Series, January, Access on 11/4/2008, http://www.brad.ac.uk/acad/peace/tmp/publications/#pdf.

Rekacewicz P. (2006), La cartographie, entre science, art et manipulation. Le Monde Diplomatique Février, 14-15.

Sample S. (2000) Military Buildups: Arming and War, In Vasquez J. A. (Eds), What Do We Know About War?, pp. 167-196. Rowman & Littlefield, New York.

Schiebinger L. (1997), Creating Sustainable Science. Osiris (Journal of the History of Science Society) 12, 201-216.

Schuurman N. (2000), Trouble in the Heartland: GIS and its critics in the 1990s. Progress in Human Geography 24, 4, 569-590.

Schuurman N. and Pratt G. (2002), Care of the subject: feminism and critiques of GIS. Gender, Place and Culture 9, 3, 291-299.

Stephen L. and Downing T. E. (2001), Getting the scale right : a comparison of analytical methods for vulnerability assessment and household-level targeting. Disasters 25, 2, 113-135.

Stephenne N. (2006) Geographical Information System, In Geist H. (Eds), The earth's changing land: An encyclopedia of land use and land cover change, pp. 251-252. Greenwood Publishing Group, Westport, CT.

Tarnas R. (1991), The Passion of Western Mind, Pimlico, London.

Tickner J. A. (1992), Gender In International Relations, Columbia University Press.

Turshen M. and Twagiramariya C. (Eds.) (1998) What Women Do in Wartime: Gender and Conflict in Africa, Zed Books, London.

Ullman R. H. (1983), Redefining Security. International Security 8, 1, 123-129.

UN Commission On The Status Of Women (1998), Thematic issues before the Commission on the Status of Women, Report of the Secretary-General, UN Commission on the Status of Women, E/CN.6/1998/5,, pp. 9.

UN Development Program (1994), Human Development Report 1994., Oxford University Press, New York.

UNFPA/WCS/OXFAM (2005), Gender and changes in tsunami-affected villages in Nanggroe Aceh Darussalam province, Report, Oxfam GB, Access on 11/4/2008, http://www.oxfam.org.uk/what_we_do/issues/conflict_disasters/downloads/gender_tsunami.pdf.

Vasquez J. A. (2000), What Do We Know About War, Rowman & Littlefield, Oxford.

Vlachová M. and Biason L. (Eds.) (2005) Women in an Insecure World, Centre for the Democratic Control of Armed Forces, Geneva.

Walker R. B. J. (1997) The Subject of Security, In Krause K. and Williams M. (Eds), Critical Security Studies: Concepts and Cases, pp. 61–82. UCL Press, London.

Walt S. (1991), The Renaissance of Security Studies. International Studies Quarterly 35, 2, 211-239.

Wastl-Walter D. and Staeheli L. A. (2004) Territory, territoriality and boundaries, In Staeheli L. A., Kofman E. and PEAKE L. J. (Eds), Mapping Women, making Politics. Feminist Perspectives on Political Geography, pp. 14-151. Routledge, New York / London.

Wood W. B. and Smith D. G. (1997), Mapping war crimes: GIS analyzes ethnic cleansing practices in Bosnia. GIS World 56-58.

Wyn-Jones R. (1999), Security, Strategy and Critical Theory, Lynne Rienner, Boulder, CO.

---

[1] See a feminist reading of assumption implicit to the adjective "hard sciences", and the hierarchical distinction from "soft sciences", in Schiebinger 1997.