

THEORETICAL-METHODOLOGICAL FRAMEWORK FOR GEOSPATIAL ANALYSIS AND GENDER STATISTICS: TOWARDS THE DESIGN OF POLICIES AND PROGRAMMES ON GENDER ISSUES



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AND PROGRAMMES ON GENDER ISSUES

Theoretical-Methodological framework for geospatial analysis and gender statistics: towards the design of policies and programmes on gender issues

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PRESENTATION

The 2030 Agenda for Sustainable Development adopted in 2015 represents a roadmap to achieve sustainable development “that leaves no one behind”. The 2030 Agenda’s commitment to gender equality and the empowerment of all women and girls is present in the 17 goals, 169 targets and 232 indicators (54 are gender specific); sustainable development will only be possible if women and men enjoy the same benefits and rights. Gender equality is integral, transversal and necessary to end poverty and hunger, promote prosperity and include growth and build specific, just and inclusive societies and guarantee the protection of the planet and its natural resources (UN Women, 2018).

More than five years after the adoption of the 2030 Agenda, questions such as the following arise: What have been the concrete results for women and girls? What indicators are necessary and what methodologies can be promoted to monitor gender equality and the empowerment of women and girls? The disaggregation of data by sex is not enough to measure progress in gender equality and to close gaps; it is necessary to integrate contexts, territorial components and multidimensional interactions to build new knowledge frameworks that allow improving the evaluation and design of public policies aimed at reducing inequalities, as well as monitoring the progress of the sustainable development goals (SDG).

The importance of integrating a conceptual framework with a territorial and gender approach responds to the challenges of accumulated gender inequalities, taking into consideration specific local contexts from a multidimensional and interdisciplinary perspective. In this sense, the usefulness and relevance of geospatial analysis with a gender perspective goes beyond considering “gender as a subject of study” (Edmunds et al., 1995) implies a transformation of the -analysis of inequalities in the territory- from the combination of qualitative and quantitative elements, since the complexity of social phenomena is heterogeneous and changing in time and space.

This document proposes an innovative methodology that allows for the construction of a geospatial tool (a platform) that visualizes and analyzes emerging issues with a gender perspective. The objectives are: a) to integrate a territorial conceptual framework with a gender perspective, for which three thematic axes are taken into account: the economic empowerment of women, care systems and feminicidal violence to exemplify that each phenomenon has different aspects, not only from its disciplinary approach, but also from its origin and the way in which the implementation and evaluation of public policies can be strengthened with a gender perspective, b) design a visual interface that shows the inequalities in the territory and provides useful geospatial information for the design and evaluation of public policies, and c) create an open source interaction module to perform geospatial analysis and construct indicators and scenarios through econometric models.

The proposal seeks to: a) strengthen the statistical and spatial treatment of existing data and create new indicators that enable the spatialization of information at different geographic scales, b) incorporate the discussion of the construction of the geospatial analysis of the information, the approach of gender, the objectives and the relevance of having gender statistics, c) linking specialists in gender issues, with multiple processes and interactions, dynamics that develop in society, various socio-economic, environmental, cultural and political contexts, which form part of the spatio-temporal and territorial analysis, and d) establish constant communication with those in charge of the formulation and implementation of public policies.

The theoretical-methodological framework for geospatial analysis and gender statistics presented in this document is part of the results of the project “Gender, research and geospatial analysis” coordinated by the Global Centre of Excellence on Gender Statistics (CEGS). The CEGS began its operations in September 2018, through a collaboration agreement between UN Women Mexico and the National Institute of Statistics and Geography (INEGI) in order to promote the exchange of expertise and innovation in gender statistics, and thus, contribute to the implementation and monitoring of the 2030 Agenda and the SDGs at the global, national, sub-national and local levels.

The CEGS plays a key role as an innovation laboratory to obtain new knowledge from an integrating gender and geostatistical framework that allows the development of indicators for the diagnosis and evaluation of public policies and programmes that contribute to monitoring the progress of gender equality. Therefore, in collaboration with specialists in gender issues and geospatial research and analysis, the CEGS proposes a construction of conceptual frameworks, dimensions, indicators and levels of geospatial analysis to analyze the issues of economic empowerment of women, care system and femicidal violence with the idea of visualizing the results through a geospatial platform.

The geospatial platform represents a substantial contribution in the process of strengthening and disseminating innovative ways to promote the production and use of gender statistics for the design and implementation of policies and programmes. In addition, it was designed using open-source software, which allows the visualization of various scales and gender differences and inequalities from the construction of scenarios through spatial and econometric modeling.

An important aspect to consider in the inter and transdisciplinary integration of a geospatial analysis is the linking of the different actors (specialists in gender statistics, individuals, groups, decision makers, among others). That is why this document aims to promote the development of geospatial methodologies with a gender perspective in such a way that it is possible to establish bridges between the different actors and at the same time participate in the territorial processes and phenomena in which gender relations and conditions of inequality develop.

Global Centre of Excellence on Gender Statistics (CEGS)

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1

THE MAIN ELEMENTS
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1 INTRODUCTION



This methodological framework seeks to respond to the constant need to analyze geographic and statistical information with a gender perspective. Integrating of geospatial factors and gender statistics are important to enhance the design and evaluation of public policies and programmes that aim to end gender inequality.

Over time, an extensive literature related to the ways of approaching gender issues have evolved, which highlights the connection between gender, territory, and spatial interactions.

The usefulness and relevance of geospatial analysis with a gender perspective goes beyond considering “gender as a subject of study” (Edmunds, et al. 1995). The combination of qualitative, quantitative elements derived from data and information or the visualization of maps show changes within a region or territory, which leads to the transformation of the analysis.

Some authors (Leszczynski and Elwood, 2015; Burnley, et al. 2008; Brown, 2003; Rocheleaud, 1995) propose the study of different gender dimensions. Once contexts, spatial components and interactions that take place in the territory are integrated, the analysis becomes more complex and needs to be approached interdisciplinary.

It is worth mentioning that, besides the official sources of information generated by the INEGI and other institutions, over time, various initiatives and proposals with a gender focus have been developed in public policy, which have provided information on the subject. Some of them are preliminary or in a development stage, others, such as the Programme to Support Women’s Institutions in the States (PAIMEF, for its Spanish abbreviation), with results for over 10 years, and which is considered a model of good practices in politics. In addition, we find programmes related to women’s economic empowerment, scholarship programmes, workshops, among many others, that seem to provide us with a wealth of information. However, the various analyses and evaluations only give partial information, depending on the programme that is evaluated, providing data that leaves out the geospatial aspects or information that is limited to evaluations of previous programme or policy of beneficiaries, and not to the study as a whole of the female population and its link with the problems and processes in the territory.

This document is the result of the process of the above-mentioned methodological integration with a focus on the public policy approach that emphasizes the interdisciplinary and cross-sectional analysis of the use of gender information and statistics that contributes to the generation of geospatial analyzes in various themes. The integrating vision of the proposal strengthens the design, implementation and evaluation of public policies with a gender perspective. Three thematic examples are mentioned as the economic empowerment of women: care systems and violence, without addressing each topic in depth in this work, but with the intention of making it clear that each one has different aspects, not only due to the disciplinary approach but also because of the ways in which they emerge as problems and are treated as public policy problems. In general, the proposal seeks to:



- Strengthen the processing of existing statistical and spatial information and to create new indicators that allow for information spatialization at different geographic scales.
- Integrate a discussion in the geospatial analysis, with a gender focus and the objectives and the relevance of having gender statistics.
- Link specialists in gender issues with different processes and dynamic interactions that take place in society, and with the socio-economic, environmental, cultural and political context that is part of the territorial and spatial analysis and with those responsible for formulating and implementing public policies.
- Establish constant communication with those in charge of the formulation and implementation of public policies.

In such a way that it is possible to build bridges between the different actors and, at the same time, shed light on the territorial processes and phenomena in which gender relations and conditions of inequality develop, which has been theorized in the intersectional studies of inequalities, a central theme in gender theory. This concept has received several criticisms, in which its ambiguity and, sometimes, its inconsistency are analyzed (Phoenix and Pattynama, 2006). However, other authors consider that it contributes to the construction of the relationship between gender issues and social theory, the recognition of inequalities, multiple and complex, territorial dimensions and how various relationships are built between social groups and projects (Walby, Armstrong and Strid, 2012; McCall, 2005; Felski, 1999; Hartmann, 1976).

Theoretical and international debates bring to the table the analysis of intersectionality through conceptual approaches, methodologies, analysis schemes that include or require the joint work of a variety of disciplines, relationships, actions and practices to contribute with multiple axes of understanding of the needs within gender issues and the possibilities of insertion in the public agenda, without neglecting that gender issues, relationships and social processes with which it is linked, are not the only reasons for inequality (McCall 2005; Lombardo and Verloo, 2009; Choo and Ferree, 2010).

In addition to this, it will be necessary to make use of the different existing statistics and data, to build other indicators from the various knowledge frameworks and geographical scales of the problems that emerge from the analysis of gender issues and territorial processes. The contribution of the presented proposal is to combine and incorporate spatial information tools that allow for visualizing and contextualize the two main themes proposed in this call: on the one hand, women's economic empowerment and the care system and, on the other, femicide violence. To do this, it is necessary to show a timeline, which gives a descriptive and statistical account of the relevance of both phenomena in the territory and, if possible, at distinct moments in time. In addition, to know the review of the treatment within social programs and public policy proposals in the field, since this would allow to know the strategies that have been implemented,



to make proposals for improvement or to strengthen and involve different actors and to know the information that could be spatialized.

This document is aimed at the National Statistical Offices with a dual purpose. On the one hand, to promote the development of geospatial methodologies using gender statistics and, on the other, to facilitate the conceptual frameworks that make the integration process of this proposal possible.



1.1 GEOSPATIAL ANALYSIS FRAMEWORK

From a transdisciplinary approach, the methodology integrates different conceptual frameworks and specialized knowledge, making use of new generation geomatic applications (Reyes and Parás, 2010). Whereby, the concrete proposal is to carry out the design of a methodology of systemic and territorial analysis, through a geospatial analysis tool, which allows the visualization of the relevant issues with the gender approach to propose spatial solutions in which processes are analyzed in those that generate gender inequality.

For inter and transdisciplinary integration of the construction of the geospatial analysis and the topics included in the technical proposal, it is necessary to link specialists in gender statistics, for the development of analysis of the sociodemographic, economic, political and cultural context; labour markets; social processes, geospatial information analysis in public policies with those in charge of preparing, formulating and implementing them. In addition to building bridges between the different actors¹ who also intervene in the process of creating and implementing public policies. The role of the actors can facilitate information flow and network construction through an effective coordination of actions related to the administrative level, knowledge requirements and communicative action².

It is also the actors who focus on policy processes, based on the conceptualization of problems and the presentation of solution alternatives to a politically defined problem.

1 Considering as actors in public policies from the individual, function, group, committee, bureaucratic team, coalition, institutions or even the State (see Santibáñez, Barra and Ortiz, 2005). Other authors define actors from more general dimensions such as economic, social and political actors (Fuenmayor, 2017).

2 Communicative action also relates to specific models for problems to be as public agenda matters, among the models there is a difference in levels of power of actors and these can be models of mediation, mediatization, mobilization, anticipation, international and national agenda, cooperative action, judicial agency, public offering, among others. This makes clear the diversity and heterogeneity of problems to be solved (ibid).



The contribution of stakeholders should not lose sight of territorial differences and phenomena, so that there is greater receptivity of context and the possibility of generating meaningful political actions with the gender approach. It is important to mention that the input of conceptual frameworks and the different visions of gender issues and the territory combined with the use of different data sources and statistical methods provide a basis for solutions, result analysis or scenario presentation.

Another central element in the integration and consolidation of a geospatial analysis methodology is the modelling process (López-Caloca et al., 2013) in which the construction of solutions cannot be uniform across all cases, since it depends on the context, spatial relations, patterns and social outcomes to which it may or may not respond. Derived from different approaches and analyses (which go both from top to bottom and vice versa), complex relationships that interact in the territory with new models and concepts prevail, which will have to be translated into key questions for the visualization of results and the link with public policies and international gender objectives set out in the 2030 Agenda and the Sustainable Development Goals (ECLAC, 2017). This approach also contributes to methodological design where the territory is a central part of the analysis; finding complex interactions in which problems occur or are built and it seek complex solutions (Fernández and López, 2017).

Thus, for the realization of the comprehensive work of the methodology in its initial stage, the following elements can be considered:

- Build the timeline and review the data with a gender focus derived from various sources and the analysis developed by specialists in the matter.
- Analyzing the stability, creation/formulation/implementation and continuity of gender-focused policies, which involves knowing how the matter is introduced and the different actors that have participated and those that can be incorporated.
- Spatial application can be an instrument for incorporating statistical and geospatial information, leading to the analysis of the spatial and temporal dynamics of gender inequalities that are part of territorial processes.
- Presentation of design contents for a proposal of geomatic solution.

For the construction of the technological tool derived from interdisciplinary work, which integrates a *methodology of geospatial analysis*, it is necessary, on the one hand, to develop strategies from a visualization scheme that determine which questions are urgent to answer, what data to collect and with techniques to analyze them and support in different sources of information, databases, reliable and quality resources in the subjects of study, technological resources for the use and storage of processes from the construction of conceptual frameworks developed by specialists and tools that enable the creation of actions from the data. All this leads to two central points:



- Generating relevant information to the design, development and evaluation of public policies on two major issues first, women's economic empowerment and care systems, and second, on femicide violence
- To enhance the information elements to the different actors involved in decision-making and to be able to have a tool based on conceptual frameworks related to the topics of study and their different levels of analysis.



1.2 TERRITORIAL AND GENDER APPROACH

In the last 20 years, the number of studies that refer to the geospatial analysis of various social phenomena has increased, making use of new technological tools that facilitate the calculation of indicators, the modelling and analysis of a collection of data. However, much of geospatial and geostatistical studies neglect the territorial dimension.

In 2001, the OECD proposed the concept of territorial capital from a regional policy context, highlighting that each region has a specific 'territorial capital'. In recent years, various territorial approaches have become a paradigm for the understanding of processes that take place in the territory and which has also been discussed in the Territorial Agenda for the European Union, including qualitative and quantitative expressions (Camagni, 2001; 2007a; 2007b; 2017).

Some dimensions to consider in the territorial approach (Perucca, 2014) are framed in three elements: 1) the scales that the territorial affects or impacts, there is no single geographic dimension for the study of phenomena. Territories change over time, as with crises and effects, 2) it is a complex system of interactions and 3) the dependence of the territory on exogenous factors.

Leszczynski and Elwood (2011 and 2015) propose other dimensions related to gender issues, spatial information and media, and the creation of innovative information and data analysis practices available, the processing, modelling and visualization possibilities provided by new technologies and the techno spatial mediation of everyday life, where stakeholders and intermediate actors play an important role in communicating actions and solutions from public policies. And, they frame how different platforms of spatial information and media are framed in social processes that involve various dynamics and constant changes.

It is precisely from this point of view that gender studies become relevant to the use of spatial tools. The design, development and subsequent inscription of these technologies in the practices and spaces of daily life do not occur in a social vacuum, but



are intimately linked to the (re) production and (re) promulgation of social gender relations, positioning the combination of territorial processes in analysis, beyond spatial analysis.

Considering these dimensions from the territorial approach allows to generate information that could be used not only to monitor the development of indicators at a territorial level of the 2030 Agenda, but also to diagnose, design, monitor and evaluate public policies and/or programmes for women's economic empowerment, which will impact on strengthening informed decisions for women's economic empowerment and consequently the advancement of the 2030 Agenda.



1.3 CONSIDERATIONS FOR GEOSPATIAL ANALYSIS OF PUBLIC POLICIES

Within the analysis of policies and programmes on the issues for *women's economic empowerment, systems of care and femicide violence* it is important to highlight what the development of public policies has been like, what has been the relationship between the state and the market, since over time policies have taken different direction and with it, new approaches emerge. However, the policy as the object of integration and action of the different social and territorial concerns, is subject to the approach of problems, its relevance, structure and functioning of each policy and programme, the actors involved in the process of elaboration and decision-making; so you cannot lose sight of the need to rethink policies and the way they are generated.

The complementarity and integration of processes related to gender issues, means that policies cannot be analyzed in isolation since there is a link with institutions, where the rules and the game of politics respond to legacy factors throughout history and difficulties of responding with a change. And, therefore, that the receptivity of policies is involved with a general and particular interest (Majone, 1997), policy changes or modifications are only possible after public opinion has been conditioned on the acceptance of novel ideas and concepts of public interest.

Policies are not a self-defined phenomenon (Majone 1997; 2014), but there is the possibility of change or transformation and their determination depends on the context in



which they develop³. However, other elements that condition the process and policy change today, such as temporal factors, space, multidimensionality of policies, norms, values and beliefs, goals, influences, among others, should be considered.

In particular, there are key elements to be considered in the analysis of public policy, with relation to space, namely: power, knowledge relationships involved in the administrative divisions of the territory (jurisdictions); forms of social interaction and formation of social alliances in the local environment/the territory, elements that will serve both for strategies that promote the consideration of decisions (Brenner, Jessop, Jones, and MacLeod, 2003).

The relationship of a tool that, through a platform, links geospatial analysis requires clarity in the problem's approach or problems, and solutions that take into account:

- The role played by the National Statistical Offices (e.g. INEGI) as generators and providers of systematized statistical information under criteria and parameters that contribute to the spatial analysis of topics that had not previously been explored, such as gender-focused statistics.
- Theoretical categories and methods through which specialists explore new geographies of space, transformative conditions from territoriality, practices and actions of state spatialization (Brenner et al., 2003).
- Not only new demands, but new relevant actors throughout the public policy process such as organizations, experts or criticism from intellectuals who push policy demands.
- Space-time analysis.
- Continuity, discontinuity or adaptation of policies that has to do with components that can be rigid, changing or flexible.
- The policies and their impact at different levels in the territory.
- Transience and gradual change in the territory and the link with different social processes that can contribute to experimentation and learning.

³ New policy demands, influence of the various groups of actors involved and influence has been analyzed from different perspectives, schools and political models, but has not reached consensus on how policies change, the clarity in the direction and timeline of change, even as changes and amendment limits arise. Therefore, policies are not always planned and many of the changes result from the imitation and construction of action models that have been experienced in other places or times, or changes that have to do with new configurations of dominant interests and political forces with different directions.



- Policy diversity increases complexity, i.e. there are recent concepts for its analysis and execution, such as: intermediaries, intermediation rules, the notion of policy space, congestion or spaces saturated with policies, autonomy or interdependence and policy overlap.
- In Mexico, gender public policies and geospatial analysis, while they have progressed, have been incomplete and no concrete and innovative solutions have been achieved on some issues such as gender-based violence.



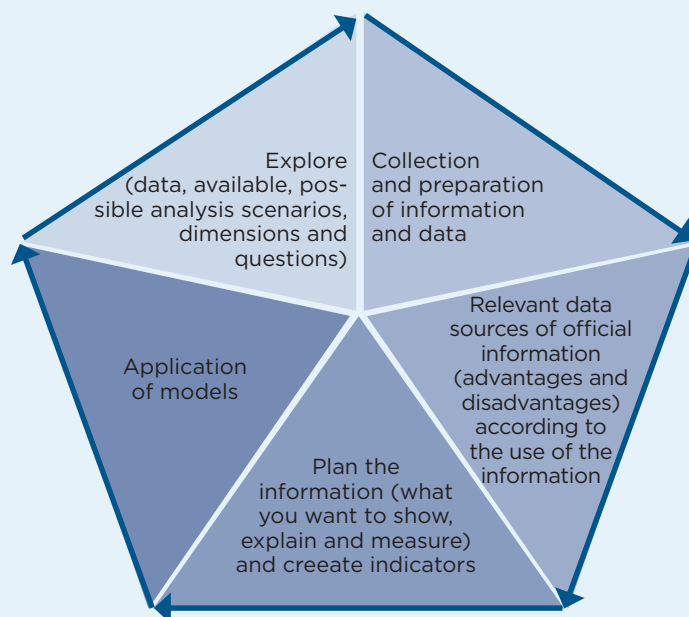
1.4 SCHEME FOR BUILDING SPATIAL, CONCEPTUAL AND THEMED CORRELATIONS

The transversality of the territory in the conceptual frameworks by gender-focused matters have several elements in common:

- They contribute to the construction of the theoretical-methodological framework and geospatial analysis based on the use of statistical and spatial information.
- Internationally agreed definitions in the 2030 Agenda and the Sustainable Development Goals (SDGs), which highlight gender equality, are considered.
- They broaden the variety of interpretations from the results and generate adequate visualizations that manage to account for the phenomena and establish bridges that communicate needs, visualization of scenarios, possible solutions and / or recommendations for improvement.
- The use of information and results beyond the standardized.
- Contribute to decision making, from support to goal setting, planning and resource allocation.
- Data management and analytics (availability of data and question formulation).
- Case description, needs and/or problems detected.
- Association with other or new variables or dimensions.



- Do not lose track of, or ignore, the data analysis cycle and the gaps in statistical information that involve:



Source: own elaboration



1.5 DATA AND VISUALIZATION

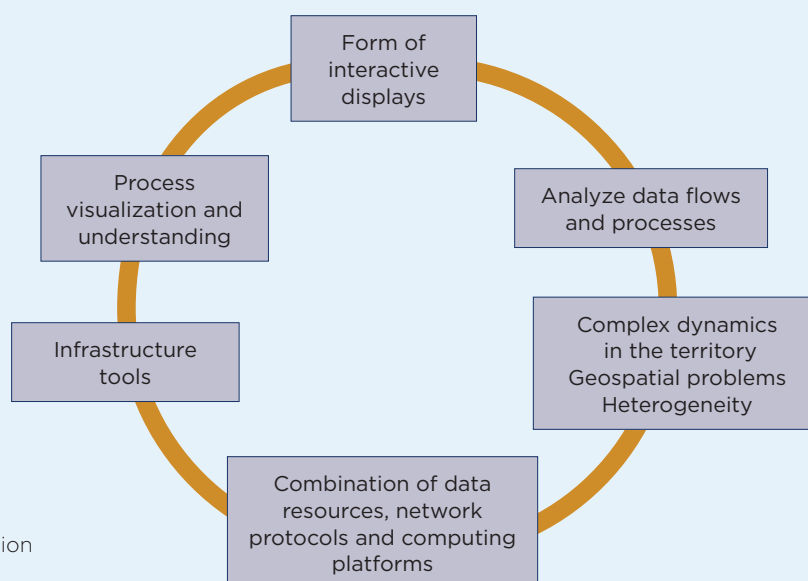
Within the framework of integration and consolidation of the methodology of geospatial analysis, the importance of information analysis should be highlighted, which will be of great use for the design and implementation of public policies and the link with actions on gender issues. This implies the (previous) work from a transdisciplinary approach, which is based on the international conceptual frameworks for the advancement and monitoring of goal five of the SDGs set out in the 2030 Agenda and the SDGs; discussion for meta-design; the quality of the analysis; emerging models of knowledge; organization; the contents and functionality of the platform (Parás and López, 2017).

Derived from the collaborative and collective work of the selection of data and the construction of variables that allow to explain each of the topics of the proposal, it is necessary to propose some goals that will be, on the one hand, part of meta-model, and on the other, of the visualization, highlighting:



- The simplification and quality of the information and the number of variables.
- The possibility to compare, through the consistency of the use of visualization tools (graphics, maps, diagrams, cartography, images, texts, videos, among others), the flexibility to use them and that comparisons serve for a greater understanding of the studied phenomena.
- Incorporation of spatial analysis, which includes territorial vision, knowledge models and the different communication and languages of the topics addressed.
- Establish consensus among specialists on *what*, and *how* to show the information and questions attempted to be answered, making use of the various forms of representation that allow to generate other analysis in the subjects of study and/or new interpretations and/or conclusions.
- To ensure that the information displayed interests the different actors involved in decision-making and suggestive of the need to raise awareness of the issues addressed in the call and their link to the goals of the UN 2030 Agenda.
- Proposal of information processing, creation, operation of the technology platform and inclusion of spatial and econometric models proposed by specialists and integrating the frameworks proposed by the Global Centre of Excellence on Gender Statistics (CEGS).

After the cycle of data analysis, creation of indicators and interpretation of results, the next phase will be linked to the identification and selection of the different elements to be visualized:



Source: own elaboration



Among the different methodological and operational challenges is the time and space correlation of information and the consideration of quantification techniques of the processes and phenomena that happen in the territory. Given that the display options have increased in relation to technological development and the potentialization of the use of information, it should not be overlooked that the objective of the methodology is to support the analysis from different perspectives and disciplines, from the conceptual frameworks of the specialists, so there is no single solution, since the complexity of social phenomena in the territory, are heterogeneous.

Added to the information challenges is the integration of geospatial analysis, where conceptual models are translated from the spatial dimension into policy-making that validates and ensures consistent policy intervention with a gender-focused approach.



1.6 TECHNIQUES AND TOOLS TO BUILD THE PLATFORM

The initial strategies for the construction of the platform derive from the definition of the central elements from thematic conceptualization and which nurture the spatial model. Using information sources and exercises that make it possible to use the platform.

The purpose of this analysis lies not only in describing the topics of study visually or cartographically, as in the case of empowerment. Implementing a geospatial approach is proposed as a tool that enables or reinforces the use and analysis of statistical data related to the global gender agenda and, in particular, the specifications of the model applied to predicting women's labour participation and their correlation to empowerment in the territory, for example at the municipal level, gender differences and inequalities, and some control and spatial variables.

It should be noted that the starting point in spatial analysis for the formation of the platform and analysis techniques may vary according to the topic, since sometimes it is part of statistical information and indicators built and tested by different experts of research or institutions that generate them, there are the topics in which the conceptual framework involves the construction and approach to criteria and dimensions in development since data are not available for study, such as heterogeneity in definitions, measurements and relationships in gender-based violence, such as femicide.

As part of the integrative vision shown in this document, it is possible to summarize some processes that have been learned along the way and that leave open the collaborative construction for geospatial implementation that resulted in a preliminary platform which includes⁴:

⁴ The platform is currently being updated.



- Exercises of spatial analysis of data by subject, an application for geospatial understanding of economic empowerment, review of conceptual construction and proposal of statistical approximation for the measurement of femicide and the search for its operationalization, beyond a definition and statistical data.
- Both topics aim to highlight why the location or position of the phenomenon is important.
- With women's economic empowerment, there are relevant efforts to collect, analyze and report data.
- An applied exercise is added where the relevant variables for analysis and their link to the territory are modelled and weighted with econometric tools.
- The theme of empowerment is visualized as part of the geospatial analysis that justifies the importance and relationship with public policy schemes.
- The platform integrates a sample for the presentation, visualization, analysis and construction of scenarios, as a first approach to its functionality.
- Use of statistical and econometric techniques that allow to create and/or change the analysis variables, with an emphasis on the territorial perspective.
- Support tools for the development of a solution proposal for geospatial analysis of gender-focused topics comprised the use of Geographic Information Systems (GIS) and econometric programmes (STATA).
- By integrating conceptual frameworks and multiple dimensions, we try to find the connection to public policy schemes.
- The preliminary design of a visual interface that integrates the results of the theme analysis, as well as providing geospatial information and contributes to the design and evaluation of public programmes and policies.

Together the platform is proposed as a tool that allows users to visualize and build some scenarios for the study of variables related to gender and equality issues. Also, from the technical design we seek to be a geospatial solution that expands the vision of georeferencing gender statistics on various matters. Its implementation involves the interaction of specialists in gender-focused topics and geospatial analysis, this new product provides geospatial information, generate possibilities to apply modelling exercises from the territory and link other narratives that enable the understanding and dissemination of knowledge models that combine the innovative techniques and development of temporal space analysis.



An initial methodology structured in three conceptual levels was proposed, which allowed the definition of conceptual elements used to design, direct, and build the thematic content of the Platform for geospatial analysis from a gender perspective and the use of Geographic Information Systems (GIS) for the development of technological solutions in relation to the analysis of geospatial information (Reyes, 2005), where the basic premises of this methodology are:

Meta-system	System Modelling	Technological solution
<p>Conceptualization stage in which the analysis of user requirements is considered, as well as the specification of the general frameworks for modelling, analysis and communication of geospatial content.</p>	<p>It includes the selection of the models for the design of the solution, such as computational, geographical, visual and cartographic models.</p>	<p>Technological strategy that meets the needs to the solution posed. It includes information and communication technologies available for integrating the technological platform.</p>

This methodology structured on three conceptual levels allowed the definition of conceptual elements used to design, direct, and build the theme content of the Platform for geospatial analysis from a gender perspective. And it was developed through the use of open-source software, which allows for constant component updates and bug fixes⁵ and support the visualization of results and maps to end users. Throughout the project, three versions of the platform that still work for evidence of this collaborative construction process were developed. Subsequently, the result is a “prototype” product, hosted within a conceptualized web platform with the intention of functioning as a dynamic interactive system in continuous improvement based on user feedback.

5 The specialists suggested that the technological requirements correspond to the implementation in a physical server with the capacity for Amazon EC2 instances. The application code integrates the installation and setup of a WebServer to support Map Deployment Applications, based on the OGC (Open Geospatial Consortium) WMS Standard; as well as installing and setting up JAVA as a Server-level development language and OpenLayers for deploying client-side maps or end users.



2

PROPOSAL EXECUTION

2. THEMATIC GEOSPATIAL ANALYSIS FRAMEWORK

As the second part of this document, complementary group-work efforts were made to approach the proposal in very different themes for its geospatial treatment that consider the emergency as study phenomena. As is the case of the economic empowerment of women, the care system and gender violence for the approach to the study of femicide. In an enunciative way, it could lose relevance and generalize the areas that could be identified in each subject, such as the conceptual framework, dimensions and indicators, the levels of spatial analysis derived from the conceptual framework in each subject, dimensions for the geospatial analysis of policies and programmes, the specificity of the data that contextualize the phenomenon and the construction of the socio-spatial problem. However, the starting point of the information will be key for the conformation of this type of analysis, as shown in the following sections.



2.1 CONCEPTUAL FRAMEWORK ECONOMIC EMPOWERMENT OF WOMEN, CARE SYSTEMS

In accordance with this theme, the broad exploration of the definitions and conceptual treatment of empowerment is analyzed. A work carried out by Orozco (2019) highlights that empowerment implies a process of change through which the possibility of women to choose between different alternatives is enabled that are strategic for their lives, through mechanisms of negotiation, exchange and decision-making. Orozco (2019) points out that this process entails a transition from a situation in which women have limited power, to one in which their power is improved. Empowerment involves: i) material, human and social resources; ii) agency, including decision-making and aspects such as negotiation; and, iii) achievements, measured mainly through results on well-being. There are three levels at which changes that facilitate the empowerment of women can take place: personal, relational and environmental (Kabeer 1999). Personal changes mainly refer to self-perception and trust, while relational changes, as the name suggests, imply changes in relationships with the family and the community. Changes in the environment refer to changes in the structure of social organization and institutions.

Economic empowerment, specifically, includes elements such as access to their own income, paid work and social protection, which women access to a lesser extent than men. Women of all economic strata are disproportionately affected by the unequal



distribution of unpaid work and care responsibilities⁶ (UN Women 2017). This distortion in the division of housework and care responsibilities also causes a substantial difference in time use among men and women, which hinders women’s social and economic empowerment (Orozco, 2019)

Orozco (2019) incorporates the organization of care systems, from an organizational analysis, as the “set of public and private actions that provide direct attention to the activities and basic necessities of daily life of people in a situation of dependency” (Law No. 19353, art. 3-B, Uruguay), that play a fundamental role in the distribution of time use of people, especially in the case of women. Care policies are part of social security and protection systems (Mateo and Rodríguez-Chamussy 2016: 138), but beyond the formal organization of care in contributory and non-contributory schemes, care systems are composed of subsystems (Durán, 2018), largely composed of non-formal schemes provided by households and their social support networks.

Societies with care systems that rely primarily on unpaid work of women within households and on informal care networks, rather than on social co-responsibility schemes and the provision of accessible and relevant public and private services, they contribute to the reproduction of unequal care loads, which mainly affect women (Elson, 2017; UN Women, 2018) and limit their possibilities of empowerment in multiple dimensions. Therefore, policies aimed at reducing the burden of care work for women may be the most efficient way to reduce gender gaps in the labour market share (UNECE, 2014; UN Women, 2018a). Based on this discussion, according to the reviews of various studies, Orozco (2019) builds the analysis of economic empowerment highlighting four dimensions from which new indicators will be derived:

I. INCOME

II. LABOUR MARKETS

III. MATERIAL AND PERSONAL RESOURCES

IV. SURROUNDINGS AND ENVIRONMENT

6 Including the care that women should cover in their homes to provide attention for younger siblings, sick or disabled people, older adults.



On the other hand, there are levels of spatial analysis derived from the conceptual framework on the subject that will lead to feedback from the platform or technological tool, such as:

GEOSPATIAL CONSTRUCTION	DIMENSIONS FOR THE GEOSPATIAL ANALYSIS OF POLICIES AND PROGRAMMES	DATA THAT CONTEXTUALIZE THE PHENOMENON	TREATMENT AND APPROACH ... A SOCIO-SPATIAL PROBLEM
<ul style="list-style-type: none"> • Timelines between definitions and legal framework in Mexico • Spatial indicators • Identification of transversal axes • Resources and intersectionality • Context and surroundings • Territory and life cycle • Policy actions and programmes • Geospatial visualization of results and narratives. 	<ul style="list-style-type: none"> • Diagram of the dimensions for the analysis of empowerment and the care system. • Review of national and international examples and specific proposals. • Proposal for the creation of the Mexico City care system and its regulatory framework. 	<ul style="list-style-type: none"> • National scope and within the international context • Temporality and data validation • Territorial unit (municipalities) 	<ul style="list-style-type: none"> • Relevant questions to answer from the conceptual framework • Analysis process to generate a methodology and visualization • Justification of why it is a socio-spatial problem for presentation within the framework of public policies (a problem of gender public policy).

Source: own elaboration



2.2 OTHER TOPICS OTHER CONCEPTUAL FRAMEWORKS

2.2.1 STATISTICAL CONSTRUCTION PROCESSES AND CONCEPTUAL FRAMEWORKS: THE COMPLEXITY OF THE ANALYSIS AND SPATIALIZATION OF GENDER VIOLENCE

In general, how to address a topic requires different approaches of analysis for its understanding and the combination of interdisciplinary schemes that provide a more comprehensive knowledge of social problems, processes and phenomena. In this sense the methodology of geospatial and territorial integration comes from innovative themed conceptualizations. Since not all topics start with data already known, to address the issue of gender-based violence it is necessary to go beyond definitions and legal frameworks. Another way to initiate an analysis is based on conceptualization, operationalization and constant search to develop a global definition for statistical purposes, which would allow homogenization and operationalization of data collection and obtain standardized measures, with the challenge of obtaining data.

With this as a backdrop, you must differentiate the levels of depth of the method or tool and the possibilities for analysis.

The issue of gender-based violence and its complexity has required a return to the approach of discussions on the legal issue since the international discussion schemes that contribute to the dimensions of analysis, the construction of variables and conceptual standardization schemes that allow to approximate the operationalization of the concept. In this context, the legal framework and international recommendations have focused on the collection of data on gender issues and statistical information, linked to issues on violence against girls and women.

For the methodology for geospatial analysis of gender-based violence in particular, the conceptualization of femicide/feminicide that is initially proposed for statistical purposes opens up a panorama of difficulties to address in order to reach a deeper level of understanding, since existing statistics and administrative records are not sufficient.

And, standardizing conceptualization for statistical purposes involves complex relationships from the different frameworks of analysis and studies carried out by academics, researchers and institutions, operationalization is a task to be performed before linking it

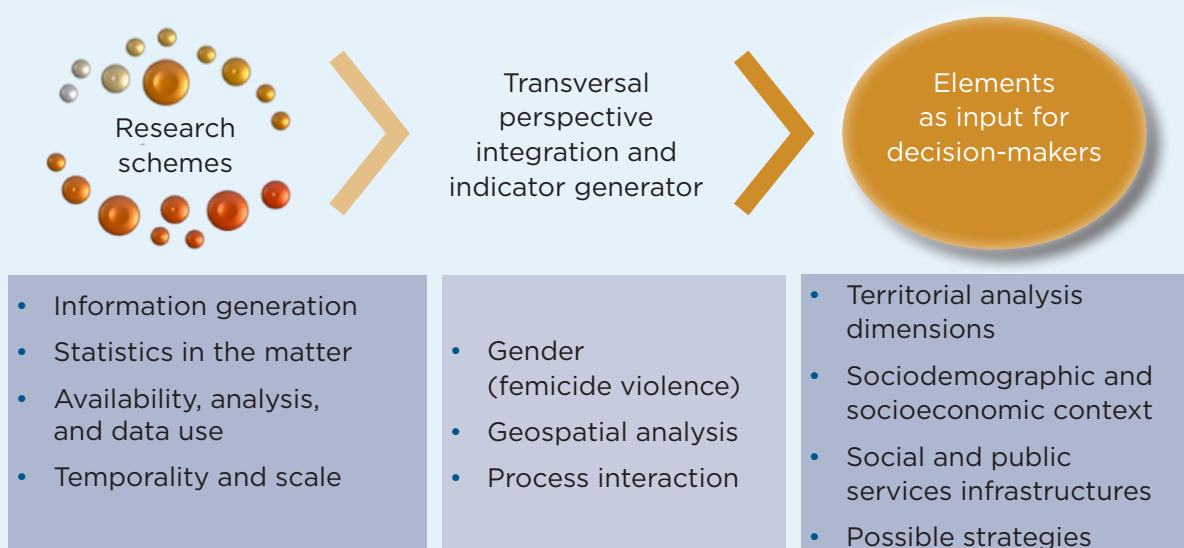


on a platform and spatial analysis. The statistical proposal is constructed from 18 criteria that are based on various variables that encompass or approach the topic of femicide or femicide, considering the sociodemographic characteristics of both the victim and the assailant, the criteria have been selected, considering the experience of Latin American countries that share elements that have been analyzed in the region and that could support the analysis or achieve an approach to a global concept of femicide/femicide (Ramírez, 2019).

This type of proposal adds the need for qualitative elements that contribute to visualize in the territory other phenomena, for which there is no data system, and start a construction from various forms of research. And at the same time, the importance of standardizing for statistical purposes and the complexity itself of the subject, since it must include the different manifestations that encompass the reasons involving gender discrimination, objective observations, characteristics and conditions of gender-related killings. Table 1 shows the relationship of other ways of bringing complex problems such as femicide to geospatial analysis, leaving open the possibility of including other issues.

The international methodology for the geospatial analysis of femicidal violence (2019) proposes to align the criteria of the 2030 Agenda, with the insistence of the central premises of gender equality and women’s empowerment to achieve sustainable development. However, the inclusion of the territorial and geospatial approach emerges as a subsequent need, thus aiming to consider geographical space and territoriality, empirical-based elements (design, monitoring and evaluation of public policies against femicide violence), contribute to the detection, evaluation and use of statistical sources with geospatial references, as well as increase the amount and availability of geospatial and statistical information with a gender perspective on femicide violence.

Table 1. Other processes for the construction from the statistical agenda on the eradication of violence against women.



Source: own elaboration



And although the insistence of standardized statistical methodologies can be criticized, it is also a start to describe the phenomenon, from the mapping, location of specialized services, possible coverage, access or existence of shelters and subsequently, search for correlations and/or causes of violence or the factors that have an effect on it.

The methodological strategy responds to:

- The integration of gender cross-cutting perspectives and geospatial analysis.
- New dimensions of analysis
- Individual characteristics
- Sociodemographic and socioeconomic context
- Social infrastructure and public services.

Elements that can contribute to the methodology from the generation of indicators related to the subject of study, geographical and territorial capital of communities and indicators of the socio-demographic and socio-economic context, highlighting the importance of sources of information to deliver preliminary results to decision-makers in public policy matters and the link with the effective and efficient use of both human and financial resources.

In such a way, it could give guidelines or answers to relevant questions, such as: in which areas is violence concentrated, the occurrence of killings, identifying high-risk areas, which factors are involved or co-existing, levels of general crime affecting the existence of high levels of violence, what actions or programmes are in operation for care and prevention, what are the profiles of the victims, who are the competent authorities to promote actions and how from the conceptualization, the problems that enter the Public Agenda are complemented by geographical capital and territorial processes (Heyns, et al., 2007).

In conclusion, it can be said that the initial purpose is to detect, evaluate and use sources of statistical information with geospatial references on femicide violence. In addition to improving the volume of information, as well as the availability of geospatial data and gender-sensitive statistics on femicide violence, the applications of the methodology (analytical framework, indicators, territorially applicable extensions), scopes and limitations, and case studies.



2.2.2 EMERGING PROBLEMS OTHER TREATMENTS

The objective of theme inclusion as a relevant public policy problem seeks to understand, diagnose, design, monitor and evaluate public policies to address the phenomenon of femicide violence. From geospatial analysis one could:

- Contribute to the discussion on violence against women, especially on the subject of femicide, its causes and consequences;
- Provide elements in the debate on the need for statistical definitions on violence against women for international comparison and coherence over time;
- Discuss the elements and components necessary for the application of geospatial analysis to the subject of femicide violence;
- Provide the theoretical-methodological basis for analysis from a geospatial perspective of other types of violence; and,
- Provide the theoretical-methodological basis to analyze other relevant matters on the matters of victimization of women on gender issues.
- In the long term, the goal of this work is to establish an internationally standardized theoretical-methodological tool with a geospatial approach to analyze the problem, as well as diagnosing, designing, monitoring and evaluating the impact of public policy decisions against femicide - and other types of violence that women suffer.
- In line with this approach, the rest of the document is structured as follows. The first section presents the conceptual framework. This part of the work introduces the theoretical aspect of the conceptual limits in which this proposal is developed for the geospatial analysis of femicide violence. For this, a review about the background, the importance of having a statistical definition for statistical purposes in the field is made, and the explanatory factors of femicide violence and possible sources of official information are discussed. Once these aspects have been defined, the second chapter develops the methodological proposal for geospatial analysis. In this part the reader will find out why this type of analysis is important and what contributions it can provide in the fight against femicide violence, the principles that should govern the application of this methodology, the needs of information and the types of geospatial analysis that can be performed. Finally, in the third part of the document an example for the case of Mexico with the intention of showing the potential of the methodological proposal is developed.
- In addition to relying on spatial econometrics estimates and models



With the aim of contextualizing such a complex phenomenon, many studies related to femicide violence have been developed, in which definitions and concepts are discussed, highlighting the different efforts that have been developed by both the international community as well as various academics and consultants specialized in the subject. The elements highlighted in the analysis are:

- Review and exploration of statistical information on femicide violence
- Proposed international definitions, concepts and frameworks
- Exploring some explanatory factors of the phenomenon
- Dimensions and levels of analysis
- Examples of risk factors and protective actions

For the construction of dimensions with different levels of questions that contribute to the spatial approach of femicide from different theoretical frameworks and the construction of scenarios that contribute to the explanation of the phenomenon and its possible causes through the construction of spatial econometric models. The levels of spatial analysis derived from the conceptual framework on the subject of gender violence within the proposal were approached in a different way, detecting some central elements for their study:

GEOSPATIAL CONSTRUCTION	DIMENSIONS FOR GEOSPATIAL ANALYSIS OF POLICIES AND PROGRAMMES	DATA THAT CONTEXTUALIZE THE PHENOMENON	PROCESSING AND APPROACH ... A SOCIO-SPATIAL PROBLEM
<ul style="list-style-type: none"> • Descriptive and territorial analysis of the information • Geospatial analysis from research (dynamics and relationships) • Analysis from legal and public policy frameworks 	<ul style="list-style-type: none"> • Political, Social, Economic and Cultural schemes • Timeline between definitions and legal framework in Mexico • Actors involved Example Ciudad Juárez - Edo response - international visibility social participation (Navarrete, 2010). International Recommendations 	<ul style="list-style-type: none"> • National context and within the international context • Temporality and data validation • Territorial unit 	<ul style="list-style-type: none"> • Justification of why it is a socio-spatial problem • Possible solutions to answer some questions from the conceptual framework • Analysis process for the methodology, visualization options and construction of some examples

Source: own elaboration



As part of the integration proposal, some results are got at different levels that derive from the themes and exercises mentioned here, intending to understand where the integration of conceptual frameworks, geospatial analysis and the search for links with different actors and users of the information lead. However, it should be noted that they are part of an approach and that they leave the door open for the incorporation and application of alternative models and technological tools.



2.3 SCOPE AND LIMITATIONS

Although the conceptual framework that is used incorporates various elements present in the literature about the meaning and forms of representation of economic empowerment, the methodology proposed from that framework focuses mainly on the definition of own labour income as an indicator of economic empowerment, based on their existing link between women's work (paid and unpaid) and care systems.

This is due, on the one hand, to the fact that labour participation and the generation of own income are the indicators most linked to the construction of autonomy and empowerment, and also those that have made the most progress in the definition and production at the international level. On the other hand, one of the premises in the construction of the methodology is to provide a frame of reference to measure empowerment based on official statistics.

The availability of data also results in a restriction on the possibilities of information use. This is due to the fact that the available data are basically limited to the dimensions of resources and achievements, leaving aside intermediate information that according to the literature also plays an important role in the empowerment process, such as that related to the women's agency, commonly not available but in some studies conducted and without national representativeness.

Despite the restriction of the approach, the literature developed since the 1960s demonstrates the importance of analyzing the different factors that are proposed, and documents the effect that the variables that measure roughly their care responsibilities, such as those proposed in the methodology have on women's insertion and the generation of own income.

Future challenges for the production and use of statistical information related to economic empowerment are centred on the creation of detailed inventories of information availability and metadata from national information systems in the countries. And later, in the production of internationally verifiable statistics, which can account for the inequalities between countries and facilitate monitoring over time that allows assessing



progress and setbacks in empowerment. Although the availability and comparability of data can present enormous variations at an international level, the capture of most of the indicators can be obtained, or are in fact already generated, with close adherence to international statistical standards.

In a more advanced phase, the production of new data whose methodologies are currently in the design process, such as those related to material resources and their yields, or those that refer to agency processes, will be part of future challenges.



2.4 THE CONCEPTUAL COMPLEXITY OF FEMINICIDE VIOLENCE, DATA, INFORMATION AND ITS PROCESSING

Regarding the theme of femicide, the exercises pointed towards finding routes and ways of geospatial analysis to strengthen the tools that contribute to the understanding of such a complex phenomenon from conceptualization, the lack of information not only on this topic, the absence of indicators that homogenize some elements for the application of different methodologies and possible measurements that account for the dimensions of a problem that has been increasing.

Proposing not only a way to approach the topic starts from identifying processes from the conceptual frameworks and the construction of measures from indicators and models adapted at first to the data, later the implementation in computational procedures and algorithms, for the application of methodologies in case studies.

From two perspectives, relevant areas for the study of femicides are identified, as well as the needs for information and statistical data, highlighting the problems of interaction between different actors, levels of government and territorial processes. The approaches to the analysis of femicide could not result from the application of a single model, visualization in space, the sum of realities and computational efficiency, but requires a great interdisciplinary and institutional effort.

In this proposal, a background review and a starting point for the construction of statistics and indicators were combined to know other dimensions for the analysis of femicide that have not yet been addressed in countries with top rates of femicide.



And that they can be part of the integration of projects with spatial extensions, that review local and regional variations, as well as the patterns of the phenomenon.

The generation of indicators requires extensive planning and allocation of resources that are linked to the action plans and implementation of public policy. In such a way that it allows to operationalize the concept and locate the red spots of danger or threat, observations of rare events and the influence of local geography and its characteristics.



2.5 THE IMPORTANCE OF QUALITATIVE METHODS ISSUES WITH A GENDER PERSPECTIVE

The value of quantitative and qualitative methods in gender-based geographic research is widely known. However, the ways of reconciling identities or affinities, multiple subjectivities, and the insistence of objectivity on gender and the insistence of objectivity in quantitative methods, traditional participatory mapping methods, oral stories, narratives, among others are increasingly complex but not impossible.

Studies and decision-making contemplate the various possibilities offered by multi-perspective methodologies that represent changes in logistics, the combination of methodological problems and the limits of the groups involved in the research, which leads to a research careful triangulation of quantitative, qualitative, and visual methods, leading to a flexible combination of methods (Rochelaud, 1995).

3. GEOSPATIAL ANALYSIS METHODOLOGICAL INTEGRATION OF POLICIES AND PROGRAMMES



3.1 JOINT CONCEPTUAL FRAMEWORK FOR THE INTEGRATION AND CONSOLIDATION OF THE METHODOLOGY

The translation of conceptual models for a geospatial analysis methodology of policies and programmes on the issues of women's economic empowerment, care systems, and femicidal violence aimed at policy formulation is challenged by spatial extension, targeting, eligibility and the definition of priorities, the evaluation of the territorial and socio-institutional structures, their limits and their interaction.

The geospatial articulation process can be reflected in the changes that have occurred from the patterns and demands of international agendas on specific issues such as, for example, gender-based violence; the proposals developed and executed by national institutions, as well as social programmes that incipiently or more advanced, propose elements for the consolidation of gender policy. That the forms of policy implementation and territorial dimension cannot ignore the heterogeneity of the territory.

Given the themed and conceptual specificities, the integration of a methodology cannot be unique and inflexible, since in a single space different processes that may arise from emerging knowledge networks may take place (López, 2011; López et. al., 2014). Thus, it applies to point out that geospatial analysis can be developed from the specificity of places and detect relevant regions in each subject. Also, the variability of processes in space generates misalignments in decision-making scale, diverse objectives and spatial effects of policies.

With the above, it is pertinent to reflect on how territorial and socio-institutional characteristics converge in each of the themes. Whenever the relevant information, spatial characteristics, and the role of actor networks, their interaction in the territory, communicative action (Muller, 2006; Del Corso et al., 2015), have been structured, services and sensitivity to (local) spatial peculiarities, mapping of the characteristics of the phenomena under study and some processes, the system becomes more complex and spatial conditions can amplify, obstruct or counteract the desired result or policy effectiveness. As a result, the conceptual framework will allow us to highlight attention to the coherence of policies regarding intervention at different scales and dimensions.

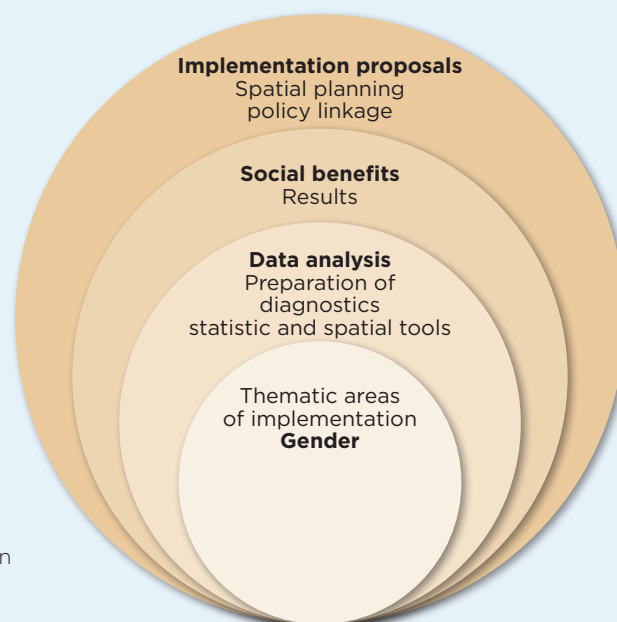


3.2 SCHEMES (THEME), DATA NEEDS AND CONSIDERATIONS IN GENERATING TRANSVERSALITY FOR METHODOLOGICAL INTEGRATION

Schemes allow us to have the first representations of the functional links between structures and processes, services, policy and social benefits of their implementation at first. Later, the geographical, institutional and territorial perspective must be added.

The integration of theoretical concepts and approaches becomes a challenge that leads to the dimensional combination and study treatments for the same problem or phenomenon (Scheme 1). On the one hand, the need for a spatial approach, in which heterogeneity is considered and the identification of scales in which a mismatch is generated between the policies and each of the topics of study, the benefits that individuals receive today and the mechanism to increase this and the impacts associated with different solution strategies or policy options. On the other, they provide justification and necessity with information to consider the costs of policies, consistency, and their correlation to space. With the possibility of incorporating the different themes to study or evaluate (Wallace 2007, 2008; Haines-Young and Potschin, 2010 and van Zanten et al., 2014).

Scheme 1. Cascade framework (first stage in reviewing the conceptual framework and its link with public policies)



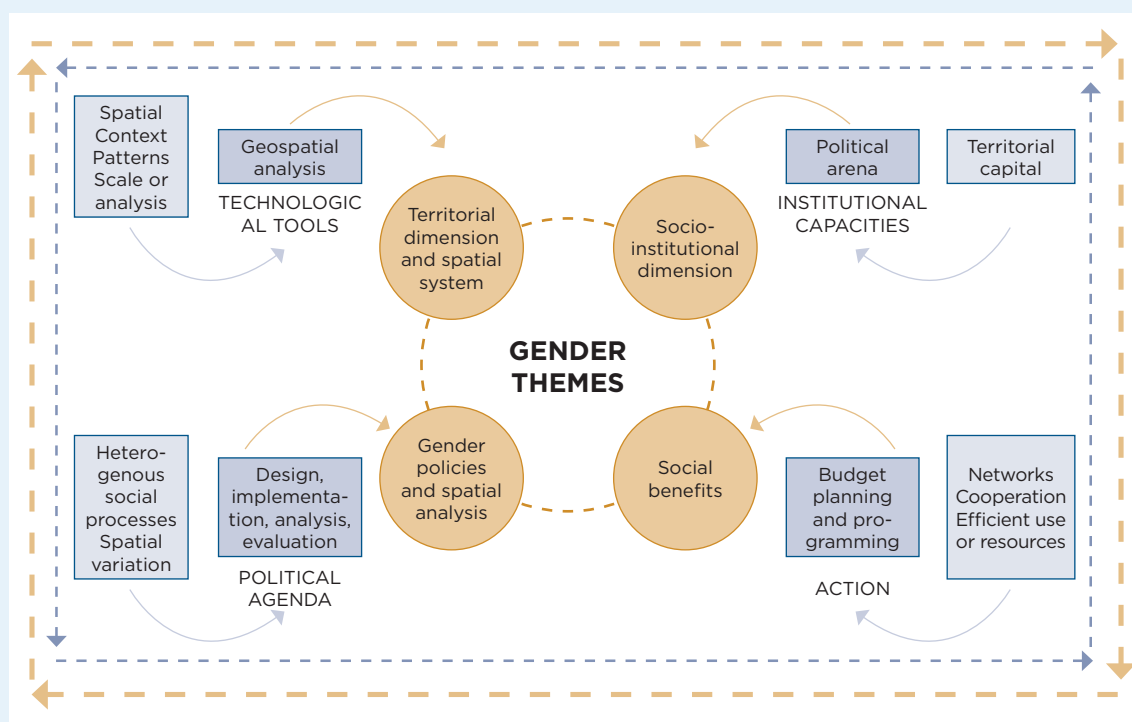
Source: own elaboration



In Scheme 2, the conceptual model has implications for research and the political agenda, in addition to pointing out some influencing factors that may derive from the institutional capacity of social, local and natural conditions (Görg, 2007).

In this scheme it should be noted that the solid lines represent the influence on the process and the dotted lines represent the mutual influence between dimensions. Therefore, the dimensions shown in the spheres describe the influence of the different actors and the institutional framework; the role of networks and profit creation; the importance of linking spatial and scale objectives, the possibilities of coordinating the effectiveness of policies and, finally, territorial conditions and other assets that affect the generation of benefits from a policy.

Scheme 2. Conceptual model integrated into geospatial analysis



Source: elaboration based on Zasada, et al., 2017.

By including the territorial context and its relationship with the effects that can be generated from the implementation of spatial policies, it could help to weigh the balances and imbalances between the objectives and the effects derived from the efficiency and effectiveness of the policies. The distribution of benefits is a function of the spatial variation of the actions and their implementation in the territory.



Certainly, the objective of spatial policies is also the result of the design of the policy and the planning process in which the different actors are involved, the networks in which they participate, the opportunity to cooperate and collaborate to improve the decision-making process and communication between each of them, managing to translate joint work into benefits for society.

The correlation with heterogeneity is addressed in policy schemes by introducing a relevant internal objective on the definitions of zoning, eligibility and priority, where the physical characteristics and limitations of the different areas come into play. This heterogeneity is complemented by other information and narratives that can be geospatialized and derived from the conceptual framework and achieve a scheme that shows an effectiveness of policies, actions and benefits, their formulation or reorientation.



3.3 DESIGN, NETWORKS, INTERACTIONS AND SCALE

For the design of policies, collaborative exchange and dialogue between social actors and researchers are required for knowledge and co-production through social learning (Görg, 2007; Zscheischler and Rogga, 2015) and that at the same time there is a validity of politics in space, the actors and the role of intermediate actors, networks and their construction.

The effective design and implementation of gender policies require a commitment to building institutional capacity, including skills and knowledge, but also governance structures at different levels (such as the local level) to integrate and negotiate values and objectives that can be in conflict within the decision-making process (Kerselaers et al., 2013; Primdahl and Kristensen, 2016).

Therefore, stakeholder input and mutual learning make gender policy design more responsive to meaningful policy actions. In such a way that gender awareness and appreciation are incorporated into policy design and spatial planning process and, derived from joint design, that agenda management on the issue offers optimal benefits, increases legitimacy and relevance of the result of the decision, recognizing the complexity and dynamism of gender themes (Loë et al., 2009).

To link governance and administrative levels with the restructuring of the spatial dimension of policies (Görg, 2007), the cycle of actors involved with each of the study themes must be taken into account. The connection with the spatial reference, represents a challenge of interconnection with built spaces (scales), where the role of intermediate actors stands out, who can facilitate the flow of necessary information and the



construction of other networks (Schomers et al., 2015) or coordinated actions between the actors, support in the definition of responsibilities, needs, knowledge requirements and statistical information.

3.3.1 THE COMPLEXITY OF THE PROCESSES

The processes that are linked to the social scale and that refer to a specific production of space lead to the generation of different structures of geographic scale with dynamic and fluid processes in which it is necessary to include other scales, such as the individual and the household (Martson, 2000), as well as the interconnection of the scales (Cox and Mair 1991; Brenner, 2001). Complex systems and territory gain importance from interdisciplinary collaboration (Wilson, 2014) and the components that make up each of the systems, involves a wide number of interactions between the components and subdivisions of a system.

The same system can be characterized by different scales, by their interaction between scales, including the temporal one, and also consider the restructuring of the spatial scales. The flexibility of methodological construction has implications for research and the establishment of a political agenda that points to the management processes in each place. Future policy research and design efforts must not only recognize the specific properties of the place but also face the complex interaction that takes place between actors and space.

In the discussion on the complexity of gender political spaces (Secor, 2001), the relevant places for geopolitical analysis include examining both the formal and informal forms of political action and mobilization. And that in the case of gender politics lead to another type of spatial analysis, such as that of Fluri (2009) and Rose (1997) highlight the concept of *situated knowledge* linking place and politics, such is the case of gender and the geopolitics of violence and, subsequently, the works that add the revision of territoriality, globalization, the theoretical conception of nation, nationalism (Hyndman, 2004; Mayer, 2004; Roberts, 2004; Wastl-Walter and Staeheli, 2004, among others).

Something similar happens with the power of gender policies and their execution, since they make the actions on the dichotomy derived from men and women clear; the formal and informal elements of politics, gender imbalances, gaps, inequalities, relationships, assumptions and norms, without a geospatial framework. However, from the field of geography they have examined, questioned and debated the gender matters, a political and social construction of the geographical scale in which the works of Brenner, 2001; Cox, 1998; Delany and Leitener, 1997; Herod and Wright, 2002; Marston, 2000; Marston and Smith, 2001; Silvern, 1999, are found.

The spatiality of phenomena is a complex expression of the processes and practices of socio-spatial regulation. The research agenda on the production and transformation of space, the challenges of geographical assumptions, changes in the spatialities of state

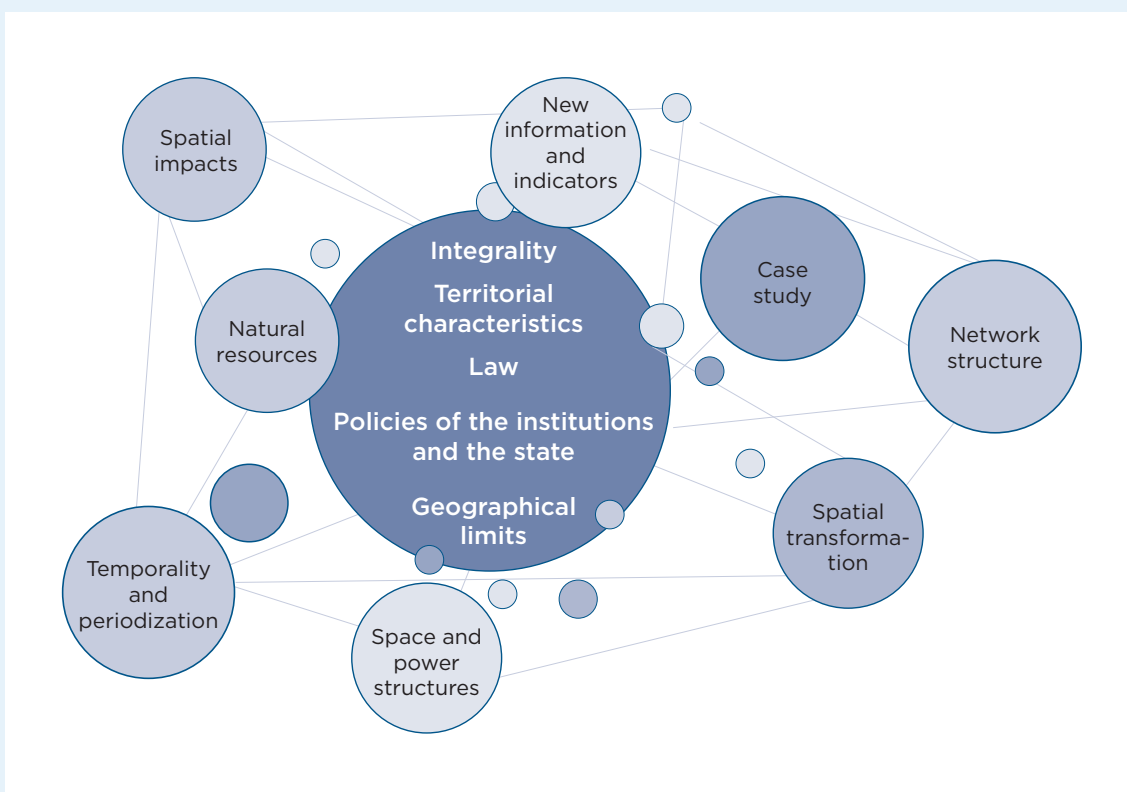


power and political life, and the development of new methodologies and tools for geospatial analysis, involve pressures, restrictions and transformations in the territory and therefore, redesign, restructuring, reorientation for the study of spatial analysis.

In the topics mentioned in this document, the restructuring of the spatial dimension of the policies will depend on the joint and continuous work of the specialists and designers of the tool, with which it will be possible to detect various dynamics that support the spatial analysis, or other dynamics can arise in the construction of and the different forms of geospatial visualization, accompanied by the narratives that contextualize and interact in each phenomenon, as shown in Scheme 3.

The above goes beyond the description of social processes and spatial relations, seeking to discover their complicity in the territorialization of the various ways of studying problems with a gender perspective, political domination, daily violence, among others. And create mechanisms to recognize gender perspectives in a policy, in which the rational equality of the original policy does not forget the relational character of gender (Dalby, 1994; Staeheli, 2001; Staeheli and Kofman, 2004).

Scheme 3. Integrality and spatiality



Source: own elaboration

4. TOOL SELECTION AND PLATFORM DESIGN



4.1 DEMO/PLATFORM

A revision of the data structure scheme is proposed from the physical and logical part of the information derived from the conceptual frameworks proposed by the specialists to generate ways of comprehending and understanding social phenomena with a gender perspective and the application of models that allow describing processes and formulating scenarios from spatial analysis.

Through data and information, the team selects together with the specialists by subject:

- Specific treatments for the construction and disaggregation of the indicators
- Construction of spatial econometric models (first exercises)
- Robustness of the models
- Testing and improving models
- Specific methods for the use of geospatial data from design and tools for its visualization (Brodaric et al., 2018)
 - Prototype implementation diagrams
 - Technical language schemes for the spatial analysis tool
 - Conceptual scheme

4.1.1 USER OPTIONS

- Outline of the bases contained by theme
- Model application
- Results



- Scenarios
- Geospatial visualization
- Possibility of identifying specific problems in a region



4.2 COMPONENTS OF SPATIAL ANALYSIS

The two theme exercises are located from an analysis of the general geographic context, the spatialization of indicators and the application of econometric models. From spatial econometrics, elements are incorporated to understand the phenomena from the component:

- Analysis from the use of information, construction of indicators and dimensions by variables.
- Conceptualization (theme) and levels of spatial analysis from the models.
- Outputs and exchanges (which can be supported in the visualization of the results and possibilities of user interaction with the tool).

That they contribute to the analysis from the consideration of narratives that contribute to the analysis of public policies, decision making, planning processes and solutions to the problems that arise from the gender perspective. And it contributes to the incorporation of other themes and/or the exploration of replicating some models.

4.2.1 GEOSPATIAL DESCRIPTION AND ANALYSIS

- Describe the differences between one spatial pattern and another, through spatial correlations and correlations.
- From complexity, representation and visualization, the importance of language.
- Tools that describe and compare forms of spatial complexity.



- Spatiality paradigm the relationship between spatial factors and social morphology.
- Achieve to close the gap between the spatial and the conceptual, through the inter-correlations of the components of social phenomena and processes in space.

4.2.2 DESCRIPTION OF THE TECHNOLOGICAL TOOL AND CONTENT

- Data display
- Descriptive analysis
- Tables, charts and graphs
- Narratives
- Videos
- Images
- Found patterns
- Scenarios
- Examples Case studies by topic (specialists)
- ...others



4.3 COMMUNICATIVE ACTION AND TRANSVERSALITY

Establish possibilities for interaction, while users interact with the resulting data visualization to generate images and explore the information space or the shared space. Interactive tools can support decision-making, helping the user to visualize social and environmental risks and to weigh uncertainties, thus reaching a more complete understanding of complex scientific or technical problems (Pidgeon and Fischhoff, 2011).



The design of an interactive application that allows the user to select the data or offers possibilities to answer some questions on a subject, from the use of statistical information, models, content and the creation of a user interface that facilitate communication with the platform from:

- The usefulness of the tool and its communicative effectiveness
- Facilitate communication of technical results
- Flexibility in its use and modification of user needs, management of techniques, feasibility and the context for which the platform has been developed (Kostelnick et al., 2013).

Exploring examples, such as case studies, serves as an example where early feedback from stakeholders can guide the design or improvement of tools for visualizing interactive data, particularly for communicating social phenomena or processes, as well as reporting specific needs for localized groups.

Another important question is how do you want to show transversal elements in the space? The technological tool or artifact and the conceptual framework is consistent with the transversal axis: Gender and territory in the different topics analyzed and the link to the central and international discussion on whether they are an issue, for example, governance, social justice, scale and geographic unit of the analysis, the temporality, the contexts are local, global, among others. And that implies thinking, what questions can we ask for the integrated methodology? Is the spatial dimension of the topics under study an extended concern? The relationships and interactions that are generated and asking what have been the mechanisms to harmonize criminal, civil, administrative, family legislation? These are questions that cannot be answered in isolation.

Finally, the decision on the tool to use, its preliminary design of the tools, the models and application, outputs and ways of making the study topics visible and the final technological solution is part of a process that is still under construction.



4.4 FINAL CONSIDERATIONS. FORMS OF INTEGRATION TO PUBLIC POLICY SCHEMES

The importance of conceptual frameworks linked to geospatial analysis distinguishes areas and links of interaction necessary to achieve a continuous dialogue between policy mechanisms and the various topics of study with a gender focus. Throughout this work, emphasis is placed on the importance of the participation of the various actors, decision-making for the effective implementation of policies or programmes, and the benefits of spatial analysis that allow responding to society's demands and serve as support to potential users of a tool that seeks to show other ways of quantifying, spatializing, and showing study phenomena with multiple narratives.

Information and specialized knowledge are the basis of localization, the study of various phenomena and construction of comparative analysis that can serve as a guide or support in the analysis of other problems, conflicts or complex systems and that from the transdisciplinary perspective of research approaches, collaborative exchange and dialogue between social actors and researchers can strengthen the co-production of knowledge.

The integration of the territorial approach is related both directly and indirectly to the effects of spatial policy, visually sensitizing the different actors to the need for intervention and improvement of programs and formulation of public policies is a necessity and a challenge for those who from Research expose the heterogeneity of problems with a gender perspective and, in particular, the spatial variability in which they occur.

Difficulties in adopting policies with a gender perspective are part of the complex processes that take place in the socio-institutional dimension, governance approaches, decision-making processes, and the results generated.

As part of a geospatial strategy, the communication and collaborative and participatory actions of the actors should be strengthened with a bottom-up scheme for the construction, design and implementation of policies with a gender perspective, besides considering aspects derived from:

- Hermeneutical logic
 - Functional geographic dimension



- Relational dimension
- Distinctive hierarchical dimension
- Spatial logic
- Territorial dimension, limitations and potential
- Network dimension and behaviour patterns
- Integration of geospatial analysis, simulation and construction of scenarios (Barr et al., 2016; Barr et al, 2013).
- Static and dynamic spatial approximations of phenomena (including spatio-temporal modelling).

In conclusion, the proposal to incorporate various conceptual frameworks and the relationship with policies continues to be a challenge at all levels of decision-making and the actors involved, despite the increasing number of exercises and attempts to include the territorial dimension and the complex interactions consistent with the intervention and solution to problems with a gender perspective, in addition to the implications of linking to international agendas and the fulfilment of goals and objectives effectively.

5. FUTURE AGENDA

- From public policy approaches, gender matters, like many others, have been part of an ongoing discursive struggle over problem definitions, frameworks, public awareness, understanding of problems, and various forms of evaluation (Stone, 2002 and Majone, 1989).
- For the design of policies and programmes on gender issues from geospatial analysis and gender statistics, it is necessary to turn the arguments through the language with the recognition that formal models distort both scientific and practical ways.
- Geospatial analysis should be introduced as a complex combination that connects relevant data and information to the conclusions of an analysis of facts, interpretations, opinions and evaluations.
- The search for solutions and the understanding of gender-based social phenomena ultimately depend on the full range of interconnections and networks of actors, not just empirical findings (Fischer, 2006), research itself, and governance.
- The challenge for those working in the public sector will be to combine knowledge of policies, social perspectives and specialized knowledge on gender issues, the sum of the technical experience, knowledge, local and political that contributes to collaborative problem solving, a more inclusive form of participatory governance.
- Beyond the different analysis and methodologies, the emphasis on definitions, explanations and findings. This approach should include an exercise in the combination of various elements (see Scheme 2) that support political deliberation and how influence the perception and understanding of political alternatives for decision-making (Hawkesworth, 1989).



3

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