



INTERNATIONAL DOCTORAL
SCHOOL OF THE USC

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PhD Thesis

'Localizing' the 2030 Agenda:
Analysis of the determinants of
the disclosure of information on
the Sustainable Development
Goals by Spanish municipalities

Santiago de Compostela, 2023

DOCTORAL THESIS

**'LOCALIZING' THE 2030 AGENDA:
ANALYSIS OF THE DETERMINANTS OF THE
DISCLOSURE OF INFORMATION ON THE
SUSTAINABLE DEVELOPMENT GOALS BY
SPANISH MUNICIPALITIES**

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PHD PROGRAMME IN ECONOMICS AND BUSINESS

SANTIAGO DE COMPOSTELA

ACKNOWLEDGMENTS

This thesis is the culmination of hard work and countless hours of dedication, a project that started in October 2020 and culminates in this document. During this period I have experienced both good and bad emotions, but the outcome of this work demonstrates a clearly positive balance.

This achievement has been possible mainly due to my directors, Professors Cristina Aibar Guzmán and Beatriz Aibar Guzmán. I have no doubt that I could not have had a more ideal team to guide and accompany me in this project. Firstly, I would like to express my deepest gratitude for their acceptance to direct my project without any conditions. The road was initially difficult, as the topic I had chosen was full of obstacles. However, thanks to the vast research experience and expertise of my directors, they were able to steer it in the best possible direction. I would also like to thank them for all their efforts and countless hours, and for their kind messages, both in moments of satisfaction and when the results were not as expected. I also owe this success to them for all these reasons and many more that go beyond words. I will always consider them a reference point in my research career, wherever I go.

I owe an immense debt of gratitude to my parents. For their unconditional encouragement, affection, and patience during this time, and for the lessons they have taught me throughout my life. They have taught me, and this thesis is an example, that with the right attitude, effort and dedication, there are no limits to what I can achieve.

I would like to thank all my family and friends, and the people I met during my thesis who made it easier and more enjoyable.

Thanks everyone.

Manuel Rieiro García

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ABSTRACT

The notion of sustainability in relation to economic development was first mentioned in the Brundtland Report in 1987. Since then, economic actors have taken various actions to achieve the overall sustainability of the planet. The most important milestone on this path occurred in September 2015, when the 193 member countries of the United Nations adopted the 2030 Agenda for Sustainable Development, which represents the largest plan of action to achieve the full sustainability of the planet, the eradication of poverty, and the prosperity of people.

In this context, local governments are seen as key actors in achieving the Sustainable Development Goals (SDGs), due to their proximity to citizens and their responsibility for providing a range of public services directly or indirectly related to the SDGs. This relevant role of local governments implies the need to disclose information to stakeholders about the actions taken in this regard, both as an exercise of public responsibility and as a model to be followed by other organizations in terms of sustainability. In Spain, the decision to disclose sustainability information by local governments is a voluntary decision and, as such, is influenced by socioeconomic, political, and demographic factors that affect which actions directly or indirectly related to the SDGs are prioritized and what information is disclosed in this regard.

Nevertheless, knowledge on the extent of SDG implementation by local governments and the initiatives they have developed in this regard remains limited, and few studies have addressed the disclosure of information related to the 2030 Agenda and the SDGs by local governments and the factors that influence this disclosure. This research aims to fill these gaps in the literature by providing evidence on how the SDGs have been integrated into the strategies and policies of local governments, as evidenced by the information they disclose on their commitment to the 2030 Agenda, and the main factors that influence the level of SDG disclosure. The study sample consists of 102 municipalities, and the study period spans from 2016 to 2021. In total, a data panel of 612 observations was configured. The information was obtained through a content analysis of the municipalities' web pages based on an index (SDGDI) composed of 60 items related to the 17 SDGs and their corresponding targets.

The results show that the commitment of Spanish municipalities to the SDGs is low, although there has been a notable increase during the analysis period, suggesting a strengthening of the commitment of local governments to the 2030 Agenda and the disclosure of SDG information. The COVID-19 pandemic marked a turning point in this regard, with greater importance being given to those SDGs that are more related to people and prosperity. The results also show a significant positive relationship between the level of disclosure of SDG information by local governments and some sociodemographic factors, with the largest municipalities and those with a higher percentage of dependent population being those that disclose more SDG information. In addition, the gender of the mayor has a positive influence on the transparency of municipalities in relation to the 2030 Agenda, with municipalities led by a woman as mayor tending to disclose more information on social and governance issues compared to environmental issues. Finally, a significant influence of the political ideology of the ruling party was found, with municipalities governed by left-wing parties having higher levels of SDG information disclosure.

This research contributes to the literature by providing an overview of the status and dynamic evolution of Spanish local governments commitment to the 2030 Agenda and SDG reporting, and by improving the current understanding of the determinants of sustainability disclosure by local governments. It also proposes a new way of measuring the contribution to the 2030 Agenda, specifically adapted to the role of local governments in this regard. On a practical level, the results help public authorities and citizens to understand the level of sustainability of local governments, assess their performance in relation to different dimensions of sustainability, and identify key challenges for future improvement.

Keywords: Local governments, 2030 Agenda, Sustainable Development Goals, sustainability reporting, SDG reporting, disclosure drivers, women politicians, political ideology.

RESUMEN CASTELLANO

La noción de sostenibilidad en relación con el desarrollo económico se mencionó por primera vez en el Informe Brundtland en 1987. Desde entonces, los agentes económicos han emprendido diversas acciones para lograr la sostenibilidad global del planeta. El hito más importante en este camino se produjo en septiembre de 2015, cuando los 193 países miembros de las Naciones Unidas adoptaron la Agenda 2030 para el Desarrollo Sostenible, que representa el mayor plan de acción para lograr la plena sostenibilidad del planeta, la erradicación de la pobreza y la prosperidad de las personas.

En este contexto, los gobiernos locales son considerados actores clave en la consecución de los Objetivos de Desarrollo Sostenible (ODS), dada su proximidad a los ciudadanos y su responsabilidad en la prestación de una serie de servicios públicos relacionados directa o indirectamente con ellos. Este relevante papel de los gobiernos locales implica la necesidad de divulgar información a los grupos de interés sobre las acciones emprendidas en este sentido, como ejercicio de responsabilidad pública y como modelo a seguir por otras organizaciones en materia de sostenibilidad. En España, la decisión de divulgar información sobre sostenibilidad por parte de los gobiernos locales es una decisión voluntaria y, como tal, está condicionada por factores socioeconómicos, políticos y demográficos que afectan a qué acciones relacionadas directa o indirectamente con los ODS se priorizan y qué información se divulga al respecto.

Sin embargo, el conocimiento sobre el grado de implementación de los ODS por parte de los gobiernos locales y las iniciativas que han desarrollado en este sentido sigue siendo limitado, y pocos trabajos han abordado el estudio la divulgación de información relacionada con la Agenda 2030 y los ODS por parte de los gobiernos locales y los factores que influyen en esta divulgación. Esta tesis tiene como objetivo llenar estos vacíos en la literatura, proporcionando evidencia sobre cómo los ODS se han integrado en las estrategias y políticas de los gobiernos locales, como se evidencia por la información que divulgan sobre su compromiso con la Agenda 2030, y los principales factores que influyen en el nivel de divulgación de información sobre los ODS. La muestra objeto de estudio consta de 102 municipios de gran tamaño, y el periodo de estudio abarca de 2016 a 2021. En total, se configuró un panel de datos de 612 observaciones. La información se obtuvo a través de un análisis de contenido de las páginas web de los ayuntamientos basado en un índice (SDGDI) compuesto por 60 ítems relacionados con los 17 ODS y sus correspondientes metas.

Los resultados muestran que el compromiso de los ayuntamientos españoles con los ODS es bajo, aunque se ha producido un notable incremento durante el periodo de análisis, lo que sugiere un fortalecimiento del compromiso de los gobiernos locales con la Agenda 2030 y la divulgación de información sobre los ODS. La pandemia del COVID-19 marcó un punto de inflexión en este sentido, dándose mayor importancia a aquellos ODS más relacionados con las personas y la prosperidad. Los resultados también evidencian una relación positiva significativa entre el nivel de divulgación de información sobre los ODS por parte de los gobiernos locales y algunos factores sociodemográficos, siendo los municipios más grandes y aquellos con un mayor porcentaje de población dependiente los que divulgan más información sobre los ODS. Además, el género del alcalde influye positivamente en la transparencia de los municipios en relación con la Agenda 2030, siendo los municipios que tienen una mujer como alcaldesa los que tienden a divulgar

más información sobre cuestiones sociales y de gobernanza en comparación con las cuestiones medioambientales. Por último, se constató una influencia significativa de la ideología política del partido gobernante, ya que los municipios gobernados por partidos de izquierdas presentan mayores niveles de divulgación de información sobre los ODS. Esta investigación contribuye a la literatura proporcionando una visión general de la situación y la evolución dinámica del compromiso de los gobiernos locales españoles con la Agenda 2030 y la divulgación de información sobre los ODS, y mejorando la comprensión actual de los determinantes de la divulgación de información sobre sostenibilidad por parte de los gobiernos locales. También propone una nueva forma de medir la contribución a la Agenda 2030, adaptada específicamente al papel de los gobiernos locales en este sentido. A nivel práctico, los resultados ayudan a las autoridades públicas y a los ciudadanos a comprender el nivel de sostenibilidad de los gobiernos locales, evaluar su desempeño en relación con las diferentes dimensiones de la sostenibilidad e identificar los retos clave para futuras mejoras.

Keywords: Local governments, 2030 Agenda, Sustainable Development Goals, sustainability reporting, SDG reporting, disclosure drivers, women politicians, political ideology.

THESIS SUMMARY (GALICIAN)

O concepto de sustentabilidade, en relación co desenvolvemento económico, tivo a súa orixe no Informe Brundtland, presentado en 1987. Este define o desenvolvemento sostible como “o desenvolvemento que satisfai as necesidades do presente sen comprometer a habilidade de futuras xeracións de satisfacer as súas necesidades” (WCED, 1987, p.23). Dende este momento, diversos actores e axentes económicos viñeron adaptando unha serie de medidas e compromisos destinados a alcanzar a sustentabilidade integral do planeta (De Iorio et al., 2022). O fito máis importante neste camiño tivo lugar en setembro de 2015, cando os 193 países membros das Nacións Unidas adoptaron a Axenda 2030 para o Desenvolvemento Sostible. Este transcendental documento representa un plan de acción meticulosamente deseñado ao redor de tres compromisos fundamentais: a erradicación da pobreza, a consecución da prosperidade da poboación e a procura da sustentabilidade plena do planeta (UN, 2015).

A creación da Axenda 2030 foi o resultado dunha vasta negociación na que participaron unha multiplicidade de actores de todo o globo terráqueo (Caiado et al., 2018). Baixo o título "Transformando o noso mundo: a Axenda 2030 para o Desenvolvemento Sostible", se delinearón 17 Obxectivos de Desenvolvemento Sostible (ODS) acompañados de 169 metas específicas. Estes ODS, que deben alcanzarse no período comprendido entre 2016 e 2030, abarcan unha ampla gama de accións e áreas de enfoque, que van desde a redución da pobreza, a preservación do medio ambiente, a promoción da igualdade social, ata cuestións relacionadas coa saúde e a educación (Verboven & Vanherck, 2016).

Baixo a súa lema “non deixar a ninguén atrás” (Weber, 2017, p. 400), esta axenda constitúe unha chamada á acción dirixida a todos os axentes económicos, instando a súa participación na consecución dos compromisos e accións de sustentabilidade adoptadas nesta axenda global, para o beneficio de toda a poboación (Verboven & Vanherck, 2016b; Patole, 2018; Mutiarani & Siswantoro, 2020). Neste sentido, esta axenda caracterízase por estar articulada de forma vertical (dende o máis global ata o máis concreto) e horizontal (integrando a todos os actores ao mesmo nivel). Entre estes actores, os gobernos, a todos os niveis, constitúen o principal axente para a consecución dos ODS (Biermann et al., 2017; Koch & Krellenberg, 2018), dada a súa responsabilidade para deseñar e promulgar políticas e accións destinadas a lograr os compromisos da Axenda 2030 por outros axentes económicos (Grover et al., 2018; Martínez-León et al., 2020), e polo seu papel de modelo a seguir por outros actores, mediante a implementación destas políticas e accións nos seus propios plans de goberno (Škare & Golja, 2014; Ribeiro et al., 2016).

No contexto de que os gobernos son responsables de adaptar os compromisos da Axenda 2030 ao contexto dos seus países (Grover et al., 2018; Martínez-León et al., 2020), os gobernos tamén desempeñan un papel clave para a consecución dos ODS (Bisogno et al., 2023), pola súa proximidade a cidadanía coñecer as súas necesidades e características (Martínez-Córdoba et al., 2022), e pola súa responsabilidade de prestar servizos públicos, como os servizos sociais, mantemento de espazos verdes e escolas ou seguridade viaria (García-Sánchez et al., 2013; Alcaraz-Quiles et al., 2015). Neste sentido, seguindo a Kanuri et al. (2016), o compromiso dos gobernos locais é necesario para lograr o 65 por cento das metas que establecen os ODS.

Este papel fundamental dos gobernos locais en relación ao cumprimento dos ODS destaca a importancia de divulgar información sobre as súas contribución e avances cara a consecución destes obxectivos (Alcaraz-Quiles et al., 2014; Navarro-Galera et al., 2018). Este exercicio é especialmente importante por dous motivos principais. En primeiro lugar,

utilízase como un medio para demostrar a responsabilidade pública destas entidades en relación ao desenvolvemento sostible e as acción que se levan a cabo nesta dirección; e, por outro lado, como un vehículo esencial para avanzar cara unha sociedade máis sostible e xusta (Marcuccio & Steccolini, 2005; Navarro-Galera et al., 2018).

No contexto español, ata a data, a lexislación vixente en materia de transparencia pública non impón ás entidades locais do sector público a obrigação de publicar información sobre sustentabilidade nin informes anuais que inclúan datos non financeiros. Non obstante, nos últimos anos publicáronse diversas leis e iniciativas relacionadas coa transparencia e sustentabilidade, como a Estratexia Española de Responsabilidade Social Corporativa (RSC), con base na Estratexia Europea 2011-2014, ou nas Leis 2/2011 e 11/2018 sobre información financeira (Larrinaga et al., 2018; Nicolò et al., 2023). Polo tanto, a decisión de divulgar información neste sentido convértese nun exercicio voluntario para os gobernos locais. Con todo, esta decisión estará influenciada por unha serie de factores socioeconómicos, políticos e demográficos que guiarán a toma de decisións e a orientación dos xestores públicos cara a acción específicas relacionadas cos ODS e a información divulgada en cada caso (Guillamón et al., 2011; García-Sánchez et al., 2013; Ribeiro et al., 2016; Rodríguez-Bolívar et al., 2018; Aguilera et al., 2021).

Neste sentido, ata a data realizáronse varios estudos que analizan o papel dos gobernos locais no cumprimento do desenvolvemento sostible e a divulgación de información sobre sustentabilidade, así como os factores que influencian este proceso (Guillamón et al., 2011; García-Sánchez et al., 2013; Ribeiro et al., 2016; Navarro-Galera et al., 2018; López-Subires et al., 2019). Sen embargo, ata a data e o noso coñecemento, non se desenvolveron estudos específicos sobre a divulgación de información directamente relacionada coa Axenda 2030 e os ODS no contexto dos gobernos locais en España. Este baleiro na investigación contrasta co crecente interese nesta cuestión no sector privado entre a comunidade académica (Garrido-Ruso et al., 2022).

En base ao anterior, e partindo de que, como se mencionou anteriormente, a divulgación de información relacionada coa Axenda 2030 e os Obxectivos de Desenvolvemento Sostible (ODS) por parte dos municipios españois constitúe unha decisión de carácter voluntario, manifestaranse diversos patróns de comportamento que variarán segundo o contexto local, e estando influenciados por factores socioeconómicos, políticos e demográficos. Así, o obxectivo principal deste traballo é analizar a influencia destes factores na divulgación de información sobre os ODS polos municipios españois a través das súas páxinas web.

Considerando este relevante papel dos gobernos como impulsores dos compromisos adoptados na Axenda 2030 e o seu impacto nos ámbitos da investigación científica sobre Responsabilidade Social Corporativa (RSC), esta investigación céntrase na análise da contribución dende unha perspectiva institucional á Axenda 2030 e os ODS. En particular, analizamos como cuestións de xénero e ideolóxicas impactan nas decisións dos xestores públicos relacionadas co desenvolvemento sustentable e cos ODS, e na divulgación de información ao respecto, introducindo tamén na análise o efecto doutras características políticas, económicas e demográficas, así como a influencia da pandemia COVID-19.

Para acadar o obxectivo deste traballo de investigación, propóñense as seguintes tres preguntas de investigación:

PI1.- Cal é o nivel de divulgación de información sobre a Axenda 2030 e os ODS dos concellos españois e como evolucionou ao longo do tempo?

PI2.- Cal é o grao de compromiso dos concellos españois coa Axenda 2030, en que ODS centraron os seus esforzos e cales son os retos que se presentan para un futuro?

PI3.- Como afectan os factores socioeconómicos, políticos e demográficos á divulgación de información?

Tomando como base a información divulgada polos gobernos locais a través das páxinas web municipais, esta investigación comeza cunha análise do grao de compromiso dos municipios españois coa Axenda 2030 e os ODS, a través das accións levadas a cabo para dar resposta a estes retos globais. Neste sentido, identificamos cales son as accións relacionadas cos ODS nas que os xestores públicos destinan máis esforzos e consideran como prioridades principais, e cales son os retos a afrontar para lograr os compromisos da Axenda 2030. Ademais, observamos a evolución temporal deste grao de compromiso, incluíndo a influencia da pandemia COVID-19, que marcou un punto de inflexión e un cambio de paradigma na forma de prestar servizos públicos dos gobernos locais (Cheng et al., 2021; Martínez-Córdoba et al., 2021b), así como na divulgación de información ao respecto (Hartanto & Siregar, 2021; Padeiro et al., 2021). Por outra banda, e tendo en conta que a divulgación de información sobre cuestión sociais, medioambientais e de gobernanza é unha cuestión voluntaria para os gobernos locais, e en consecuencia, estará influenciada por factores socioeconómicos, políticos e demográficos, a terceira pregunta de investigación busca analizar cales son os determinantes da divulgación de información relacionada coa Axenda 2030 e os ODS.

Para isto, propoñemos cinco hipóteses de investigación ligadas a esta terceira pregunta de investigación (PI3), que se resumen na seguinte Táboa, as cales foron contrastadas en dous dos artigos que sustentan este traballo de investigación.

Pregunta de investigación 3 ¿Como afectan los factores socioeconómicos, políticos e demográficos á divulgación de información?	Artigo que aborda a hipótese
H1 A divulgación sobre os ODS é maior en municipios gobernados por unha alcaldesa muller.	Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. <i>Cities</i> , 141, 104461.
H2 A divulgación sobre os ODS é maior en municipios con maior porcentaxe de mulleres concelleiras no pleno municipal.	
H3 A divulgación do ODS é maior nos municipios liderados por mulleres maiores cunha maior representación de mulleres concelleiras no pleno municipal.	
H4 Os municipios nos que o partido gobernante ten unha ideoloxía de esquerdas teñen máis probabilidades de comprometerse coa Axenda 2030 e divulgar información sobre a súa contribución aos ODS.	Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. <i>Politics & Policy</i> , 51(5), 800-829.
H5 Os municipios onde hai un maior nivel de fragmentación política teñen máis probabilidades de divulgar información sobre a súa contribución aos ODS.	

Esta investigación realizase utilizando unha mostra común para todos os artigos que compoñen a Tese. En primeiro lugar, escollemos unha mostra de 102 municipios, seguindo o criterio de municipios de gran tamaño, segundo o disposto no artigo 121 da Lei 57/2003, do 16 de decembro, de medidas urxentes para a modernización do goberno local, definido estes como os concellos con poboación superior a 75,000 habitantes. Ademais, seguindo a García-Sánchez et al. (2013), os municipios de maior tamaño teñen maior dispoñibilidade de recursos técnicos e humanos para divulgar información social, medioambiental e de gobernanza.

O sector público español estruturase en tres niveis: o goberno estatal, os gobernos rexionais e os gobernos locais. Así, existen 17 Comunidades Autónomas, 50 provincias, 2 cidades autónomas e 8,129 municipios.

O período de análise concéntrase nos anos 2016 a 2021, coincidindo coa entrada en vigor da Axenda 2030 e ata a data na que se dispón de datos consolidados. A información necesaria para a realización desta investigación recolleuse mediante unha análise de

contidos das páxinas web municipais, utilizando un listado de 60 ítem, elaborado en base á análise da literatura previa en RSC (García-Sánchez et al., 2013; Cuadrado-Ballesteros et al., 2014; Navarro-Galera et al., 2014; Nevado-Gil & Gallardo Vázquez, 2016; Ortíz-Rodríguez et al., 2018), e apoiado no listado dos 17 ODS e as súas respectivas metas, seleccionando aquelas accións que recaen sobre a xestión directa dos municipios. Así mesmo, para complementar os datos non dispoñibles, utilizamos fontes secundarias (instituto nacional de estatística, institutos rexionais de estatística, organismos ministeriais e informes oficiais). En total, obtivéronse 612 observacións.

No primeiro artigo (Rieiro-García, M., Amor-Esteban, V., & Aibar-Guzmán, C. (2023). 'Localizing' the sustainable development goals: A multivariate analysis of Spanish regions. *AIMS Environmental Science*, 10(3), 356–381), analizamos o estado actual do grado ate o que están os municipios comprometidos coa Axenda 2030, utilizando a información sobre as iniciativas relacionadas cos ODS divulgadas a través das páxinas web. Esta análise empírica realizouse empregando a técnica X-STATIS de análise multivariante, obtendo, en primeiro lugar, un baixo grado de compromiso cos ODS por parte dos municipios españois (37.2%), aínda que cunha evolución notablemente crecente durante o período estudado, pasando do 34.4% en 2016 ao 43.1% en 2021, o que suxeriría un fortalecemento do compromiso dos xestores públicos coa Axenda 2030 e a divulgación de información sobre os ODS. Desta análise de evolución destacase tamén un punto de inflexión en 2019, que podería explicarse polo efecto da pandemia COVID-19 no cambio radical dos gobernos por priorizar accións e divulgar información.

Respecto ós obxectivos máis priorizados polos gobernos locais, destacan o ODS8 e ODS11, seguidos do ODS3, ODS4 e ODS13-15, e, polo contrario, os ODS5, ODS6 e ODS17 como os menos priorizados, o que se pode interpretar como unha maior preferencia por accións sociais e medioambientais, fronte as de gobernanza.

O segundo artigo (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. *Cities*, 141, 104461) aborda a análise da influencia de cuestións de xénero na divulgación de información sobre os ODS. En concreto, analizamos o efecto do xénero da alcaldesa e a porcentaxe de mulleres concelleiras que forman o pleno municipal. Os resultados obtivéronse a través dunha regresión Tobit con datos de panel. En primeiro lugar, observamos unha representación balanceada de xénero nos plenos municipais, cun 45.64% de concelleiras, en media, e unha baixa participación de mulleres en cargos de alcaldesa, con tan só un 27.5%. Os resultados evidencian que o xénero da alcaldesa é relevante para a divulgación de información sobre os ODS, sendo aqueles municipios nos que goberna unha muller como alcaldesa os que máis información divulgan sobre os ODS. En canto ao número de concelleiras nos plenos municipais, observouse un efecto moderador positivo no efecto que exerce que o municipio este gobernado por unha muller alcaldesa, sendo aqueles municipios con maior participación de mulleres en cargo de concelleira, e representados por unha muller alcaldesa, os que máis información divulgan sobre os ODS. Neste sentido, tamén se destaca que os municipios cunha alcaldesa tenden a divulgar máis información das dimensións sociais e de gobernanza.

No terceiro artigo (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. *Politics & Policy*, 51(5), 800-829), empregando a mesma técnica de análise do segundo artigo abordase a análise da influencia dos factores políticos na divulgación de información sobre os ODS. En particular, analízase a influencia da ideoloxía do partido do goberno local e o nivel de fragmentación política. Así, utilizando a técnica de regresión Tobit con datos de panel, os estatísticos descritivos mostran unha predominancia dos

partidos políticos de esquerdas nos gobernos municipais (67.3%), e un elevado nivel de fragmentación política, medido por un baixo índice de concentración de partidos políticos (0.1542). Os resultados da investigación evidencian un efecto significativo da ideoloxía do goberno na divulgación de información sobre os ODS, sendo os municipios con un goberno de esquerdas os que divulgan máis información sobre sustentabilidade. En canto á fragmentación política, esta exerce un efecto moderador negativo na habilidade dos gobernos de esquerdas para divulgar información sobre os ODS. En canto aos tipos de información divulgada, observase unha preferencia dos gobernos de esquerdas por divulgar máis información social e de gobernanza. Ademais, tamén se observa que unha menor fragmentación política provoca un efecto negativo sobre a divulgación de información da dimensión social por parte dos xestores públicos.

De xeito xeral, os resultados dos estudos realizados nos tres artigos que compoñen a Tese poñen de manifesto que a divulgación de información sobre os ODS está influenciada de forma positiva por factores demográficos e económicos, sendo aqueles municipios con maior número de habitantes, maior poboación dependente e maior volume orzamentario aqueles que divulgarán máis información sobre os ODS. Ademais, en canto ao efecto da pandemia COVID-19, que marcou dende o 2020 un cambio radical nas axendas dos gobernos locais, observase un efecto positivo na divulgación de información sobre a Axenda 2030 e os ODS.

Este traballo de investigación aporta contribucións relevantes para a literatura. Por unha parte, dende un enfoque teórico, salientase a utilidade da teoría dos stakeholders e da teoría institucional para explicar o compromiso dos gobernos locais coa Axenda 2030, existindo factores socio-demográficos e culturais que influencian a implantación de iniciativas ligadas á consecución dos ODS polos gobernos locais, así como a divulgación de información. Os resultados destacan que as diferenzas en termos de características xeográficas, demográficas e económicas influencian os principais desafíos que afrontan os gobernos locais na implementación de políticas públicas relacionadas cos ODS, e en consecuencia, na divulgación de información sobre sustentabilidade. Por outra banda, dende un punto de vista práctico, os resultados permiten comprender o nivel de sustentabilidade dos municipios, avaliar o seu desempeño nas diferentes dimensións da sustentabilidade (medioambiental, social e de gobernanza), e identificar os principais desafíos aos que se enfrontan para cumprir cos compromisos da Axenda 2030. En particular, demostrase que os municipios españois teñen que mellorar o desempeño de accións relacionadas coa igualdade de xénero, auga limpa e saneamento, e as alianzas para o logro dos obxectivos. Neste sentido, os resultados do primeiro artigo poden guiar aos responsables políticos no deseño de medidas destinadas a mellorar estas cuestións naqueles municipios e rexións con niveis máis baixos de compromiso cos ODS, reducindo as desigualdades. No segundo artigo, sublíñase a importancia de promover a diversidade de xénero para lograr a Axenda 2030 e incentivar a participación das mulleres na vida política. E, por último, o terceiro artigo aporta unha comprensión para a cidadanía sobre se o grado de influencia das diferenzas en opinión e valores dos gobernos locais relacionados coa súa ideoloxía política afectan aos compromisos cos ODS, ou se polo contrario, o compromiso coa Axenda 2030 vai máis alá dunha cuestión de ideoloxía política.

En resumo, o baixo nivel compromiso coa Axenda 2030 e divulgación de información sobre os ODS por parte dos municipios de España suxire que aínda queda un longo camiño por percorrer para acadar a transparencia no contexto da Axenda 2030. Neste sentido, o índice para medir o grado de divulgación sobre os ODS que se propón nos artigos segundo e terceiro que compoñen a Tese podería proporcionar aos xestores

públicos e cidadáns unha ferramenta para avaliar a situación actual e orientar as súas decisións en materia de accións sostibles.

Non obstante, é importante resaltar que esta investigación presenta dúas limitacións principais. Por unha parte, o contexto xeográfico escollido de estudo centrase nun país específico, España, o que podería limitar a xeneralización dos resultados a outros contextos, como países menos polarizados. Por outra parte, o tamaño da mostra de 102 municipios podería nesgar os resultados e levar a conclusións equívocas. Non obstante, neste sentido, dada a menor dispoñibilidade de recursos económicos, técnicos e humanos dos municipios de poboación inferior a 75,000 habitantes (García-Sánchez et al., 2013), podería reducir a cantidade de información divulgada sobre sustentabilidade, e dificultar a obtención de resultados concluíntes. Futuros estudos poderían ampliar o alcance da mostra a outros países, incluíndo un maior número de municipios. Así mesmo, poderíanse utilizar modelos econométricos para analizar o efecto de factores socio-demográficos, mencionados neste traballo de investigación no grao de compromiso dos municipios españois coa Axenda 2030, e incluíndo outras variables, como ter en conta o perfil das alcaldesas e concelleiras (idade, formación académica, etc.), e incluír un maior número de variables de control.

1 INTRODUCTION

1.1 OVERVIEW

The notion of sustainability in relation to economic development was first mentioned in the Brundtland Report in 1987. It defined Sustainable Development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 23). Since then, economic actors have taken various actions to achieve the overall sustainability of the planet (De Iorio et al., 2022; Bisogno et al., 2023). The most important milestone on this path occurred in September 2015, when the 193 member states of the United Nations (UN) adopted the 2030 Agenda for Sustainable Development, which represents the largest plan of action to achieve the full sustainability of the planet, the eradication of poverty, and the prosperity of people (UN, 2015). To this end, the 2030 Agenda includes 17 Sustainable Development Goals (SDGs) and 169 related targets, covering topics such as poverty reduction, education, social equality, and health, among others (Verboven & Vanherck, 2016; García-Sánchez et al., 2022; Wei et al., 2022).

This global commitment integrates all economic actors, both public and private, in achieving the SDGs and related targets to benefit the entire world population through the implementation of sustainable actions (Patole, 2018; Verboven & Vanherck, 2016; Mutiarani & Siswanto, 2020). On this basis, it can be said that the 2030 Agenda is articulated vertically (from the most global to the most concrete) and horizontally (integrating all actors at the same level). In particular, governments at all levels are major actors in the achievement of the SDGs (Biermann et al., 2017; Koch & Krellenberg, 2018), as they are responsible for adapting these commitments and promoting policies and regulations that enable their compliance through the actions of other economic actors (Grover et al., 2018; Martínez-Leon et al., 2020), and also through their role as a model for other actors by integrating these actions into their government strategies (Škare & Golja, 2014; Ribeiro et al., 2016).

In this context, although national governments are responsible for adapting the commitments made with the 2030 Agenda to the characteristics and context of each country (Grover et al., 2018; Martínez-Leon et al., 2020), local governments are considered key actors for achieving the SDGs (Bisogno et al., 2023), because they are the level of government closest to citizens and are aware of their specificities and needs (Martínez-Córdoba et al., 2022), and because they are responsible for providing a range of public services, such as social services, maintenance of parks and gardens and road safety, which are directly or indirectly related to the SDGs (García-Sánchez et al., 2013; Alcaraz-Quiles et al., 2014). According to Kanuri et al. (2016), the involvement of local governments will be required to achieve up to 65 percent of the targets set for the SDGs. The relevant role of local authorities in achieving the commitments of this universal agenda implies the need to disclose information to stakeholders on the actions taken in this regard (Alcaraz-Quiles et al., 2014; Navarro-Galera et al., 2018), both as an exercise of public responsibility, understood as a demonstration to stakeholders of the municipality’s commitment to sustainable development and the actions taken to achieve

it, and as a model to be followed by other organizations in terms of sustainability, in order to evolve towards a more equitable and sustainable society.

In Spain, transparency on these issues is not mandatory for the public entities, as there is no law requiring them to do so. However, in recent years several laws and initiatives have been implemented regarding transparency and sustainability, such as Law 19/2013 on transparency, access to information and good governance; the Spanish CSR Strategy, in line with the European Strategy 2011-2014; or Laws 2/2011 and 11/2018 on financial information (Larrinaga et al., 2018; Nicolò et al., 2023). Therefore, the decision to disclose sustainability information by local governments is a voluntary decision and, as such, is influenced by a set of socio-economic, political and demographic factors that guide the decision-making and orientation of public managers towards specific actions related to sustainability and, consequently, the extent and type of sustainability information they disclose (Guillamón et al., 2011; García García-Sánchez et al., 2013; Ribeiro et al., 2016; Rodríguez-Bolivar et al., 2018; Aguilera et al., 2021).

In this regard, several studies have been carried out to date that analyse the role of local governments in achieving sustainable development and the disclosure of information on sustainability by local entities, as well as the factors that influence this process (Guillamón et al., 2011; García-Sánchez et al., 2013; Ribeiro et al., 2016; Navarro-Galera et al., 2018; López-Subires et al., 2019). These studies have used different theoretical frameworks commonly applied in sustainability and voluntary disclosure research, such as institutional theory, resource and capability theory or stakeholder theory, to develop hypotheses and explain the results obtained, and have developed indices to measure the sustainability information voluntarily disclosed by local governments.

Consequently, it seems reasonable to assume that the same set of socio-economic, political and demographic factors that influence the sustainability orientation and transparency of local governments will also influence which actions directly or indirectly related to the SDGs are prioritized and which are relegated, as well as what information is disseminated about them (Ortiz-Rodríguez et al., 2018; Alcaraz-Quiles et al., 2015; Ruiz-Lozano et al., 2019; Nicolò et al., 2023; Bisogno et al., 2023). However, to date and to the best of our knowledge, no specific studies have been developed on the dissemination of information directly related to the 2030 Agenda and the SDGs in the context of local governments in Spain. This research gap contrasts sharply with the growing interest in this topic in the private sector within the academic community (Garrido-Ruso et al., 2022).

1.2 RESEARCH MOTIVATIONS

The relevant role of local governments in achieving the commitments of the 2030 Agenda has been widely highlighted in the academic literature (Alcaraz-Quiles et al., 2020; Masuda et al., 2022). Nevertheless, knowledge about the extent of SDG implementation by local governments and the initiatives they have developed in this regard remains limited (Croese et al., 2021). Furthermore, previous studies, such as those by Alcaraz-Quiles et al. (2015) and Navarro-Galera et al. (2019), have highlighted the key role of local governments in relation to sustainable development and the importance of disclosing information about their sustainability-related actions. However, most research to date has focused on sustainability in a more general context (e.g., García-Sánchez & Prado-Lorenzo, 2008, 2009; Guillamón et al., 2011; García-Sánchez et al., 2013; Ribeiro et al., 2016; Rodríguez-Bolivar et al., 2018; Navarro-Galera et al., 2018, 2019; López-Subires et al., 2019; Aguilera et al., 2021) and there are few studies that directly address the disclosure of information related to the 2030 Agenda and the SDGs by local governments and the factors that influence this disclosure.

Therefore, this research project aims to fill these gaps in the existing literature by providing evidence on how the SDGs have been integrated into the strategies and policies of local governments, as evidenced by the information they disclose on their commitment to the 2030 Agenda, and the main factors that influence the level of SDG disclosure, including the impact of the COVID-19 pandemic.

1.3 THESIS STRUCTURE

This thesis is based on three published articles, each of which aims to answer one or more of the three research questions posed to meet the main objective of the research project. These articles share the same sample and research methodology, which are explained in detail in the following section. This is followed by a discussion of the potential contribution and main theoretical and practical implications of the findings, as well as their limitations and possible extensions. Finally, the thesis ends with the conclusions drawn from the main research findings.

The first article (Rieiro-García, M., Amor-Esteban, V., & Aibar-Guzmán, C. (2023). 'Localizing' the sustainable development goals: A multivariate analysis of Spanish regions. *AIMS Environmental Science*, 10(3), 356–381) aims to answer to the first research question (RQ1). This paper presents an analysis of the current situation regarding the commitment of Spanish local governments to the 2030 Agenda and its evolution over the period 2016-2021. The X-STATIS technique was used to conduct a multivariate analysis that includes two levels of analysis: (1) analysis by SDGs, to determine which SDGs local entities have focused their efforts on and which have been addressed to a lesser extent throughout the study period, and (2) analysis by regions and entities, to determine the extent to which these actions are related to the contextual characteristics of the municipalities and the demands they make in the context of the 2030 Agenda.

The next two articles aim to answer the latter two research questions, analyzing the degree of disclosure of information about the 2030 Agenda by Spanish city councils (RQ2) and the factors that determine it (RQ3). As mentioned above, hypotheses 1, 2 and 3 are contrasted in the second article (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. *Cities*, 141, 104461) and hypotheses 4 and 5 are contrasted in the third article (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. *Politics & Policy*, 51(5), 800-829.)

The second article addresses an "evolving topic" that deserves more attention, namely the role of women's leadership in relation to the 2030 Agenda and the SDGs (Barrios et al., 2020). Specifically, this paper analyzes the influence of the gender of elected officials in municipalities on the level of information disclosed by Spanish local governments on the initiatives developed to achieve the 2030 Agenda.

Finally, considering that there are "competing views" on sustainable development and how to address it, resulting in considerable variation in the importance of sustainable development issues on the political agenda (Söderbaum, 2017), the third article focuses on the influence of the governing party's political ideology on the city council's commitment to the SDGs and disclosure in this regard. Since the ability of the ruling party to pursue its policy agenda is constrained by the degree of political fragmentation that exists in the city council (Aguilera et al., 2021), the effect of the degree of political fragmentation in the city council is also analyzed in this paper.

1.4 REASONED JUSTIFICATION OF THE UNIT AND THEMATIC AND METHODOLOGICAL COHERENCE OF THE THESIS

In order to achieve the above objective, this research project consists of three articles published in journals indexed in JCR or Scopus. These articles form a thematic unit, since all three focus on the same topic: the analysis of the degree of commitment of Spanish local governments to the 2030 Agenda and the disclosure of information on the SDGs, as well as the identification of the main factors that influence the level of disclosure of the SDGs. Each article focuses on a different group of factors (socio-economic, demographic, and political), so that the results obtained in each article complement and extend those of the others, and all together provide a complete picture of the topic under study, allowing the reader to know the current state and evolution of the disclosure of information on the SDGs in the Spanish local public sector, as well as the factors that influence it.

In addition, the methodological coherence between the three articles that compose the thesis is guaranteed by the fact that they share the same sample (102 large Spanish municipalities, in accordance with Article 121 of Law 57/2003) and the same starting data (obtained using the content analysis technique of the information on the SDGs that city councils have published on their websites between 2016 and 2021, based on a list of 60 items related to the 17 SDGs and their corresponding targets).

Based on the information obtained from the content analysis carried out, the first article provides a detailed analysis of the evolution of the disclosure of information on the SDGs by the different municipalities that make up the sample under study, grouping the different information items according to the specific SDG to which they are most related. For the remaining two articles, the same information was used to construct a disclosure index (which measures, in aggregate form, the degree of disclosure of information on the SDGs by the municipalities in the sample over the study period) and to develop models to test the hypotheses posed in relation to the factors affecting information disclosure. This disclosure index is the dependent variable in the models of the second and third articles. In each case, the independent variables refer to the factors analyzed in the corresponding article, while they share a set of control variables representative of other possible factors that condition the commitment to sustainability and information transparency of city councils.

All the articles are in line with what was established in the research plan on which the thesis is based. The following figure schematically reflects the thematic unit of the thesis and the interrelationships between the articles that make it up.

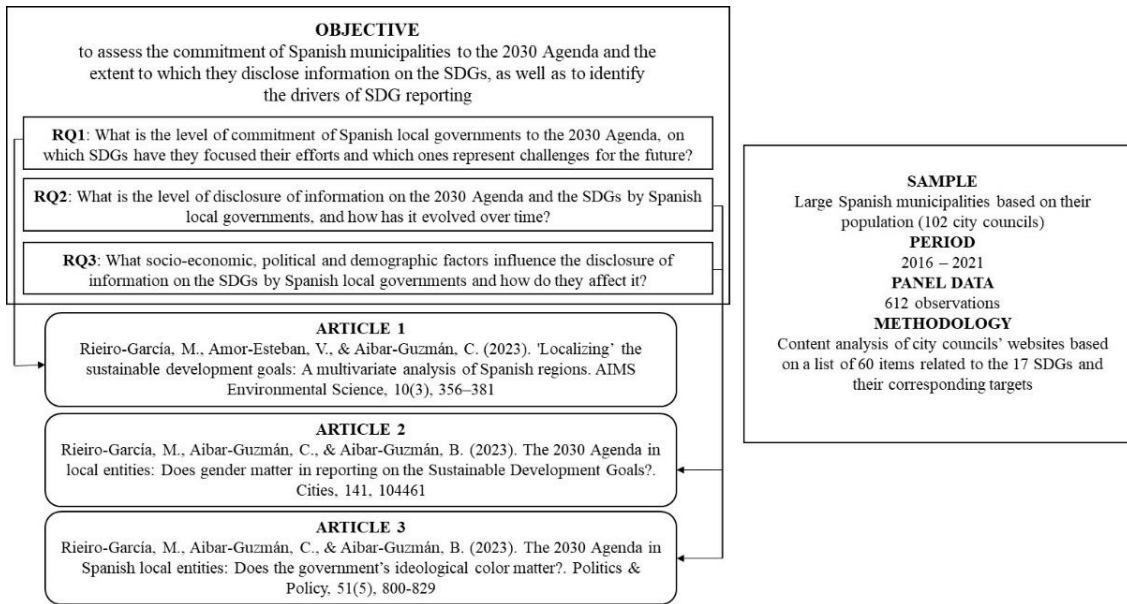


Figure 1. Thematic and methodological unit of the thesis
(Source: Own elaboration)

2 OBJECTIVES AND HYPOTHESES

2.1 OBJECTIVES AND RESEARCH QUESTIONS

The main objective of this research project is to assess the commitment of Spanish municipalities to the 2030 Agenda and the extent to which they disclose information on the SDGs, as well as to identify the drivers of SDG reporting. The focus on Spain is justified given the strong public commitment to the 2030 Agenda, which is central to the national government's plans (Boto-Álvarez & García-Fernández, 2020).

Specifically, we will try to answer the following three research questions:

RQ1: What is the level of commitment of Spanish local governments to the 2030 Agenda, on which SDGs have they focused their efforts and which ones represent challenges for the future?

RQ2: What is the level of disclosure of information on the 2030 Agenda and the SDGs by Spanish local governments, and how has it evolved over time?

RQ3: What socio-economic, political and demographic factors influence the disclosure of information on the SDGs by Spanish local governments and how do they affect it?

Therefore, based on the information they have disclosed in this regard on their websites, this research project takes as its starting point an analysis of how and to what extent Spanish local governments have committed themselves to the 2030 Agenda and the SDGs by implementing actions to respond to these global challenges. We aim to identify which actions related to the SDGs are the most relevant for Spanish local governments and, conversely, which are the main challenges for achieving the 2030 Agenda, as well as to analyze how their commitment to the SDGs has evolved over time. In particular, and considering that the COVID-19 pandemic implied important changes in the prioritization of actions within government agendas and in the way governments, especially at the local level, deliver public services to citizens (Cheng et al., 2021; Martínez-Córdoba et al., 2021c), as well as in the disclosure of information through their digital platforms (Hartanto & Siregar, 2021; Padeiro et al., 2021), the impact of the COVID-19 pandemic on local governments' commitment to the 2030 Agenda will be analyzed.

We will then focus on SDG reporting, first by analyzing the extent of SDG disclosure by Spanish city councils and its evolution over time, and second by looking at its determinants. In this regard, we will mainly focus on the political factors that characterize and condition the activities of city councils, although we will also consider the influence of socio-economic factors and the impact of the recent COVID-19 pandemic.

2.2 RESEARCH HYPOTHESES

To achieve the research objectives and answer to the third research question (RQ3: What socio-economic, political, and demographic factors influence the disclosure of information on the SDGs by Spanish local governments and how do they affect it?), five research hypotheses were proposed in relation to which are summarized below and tested in the second and third articles that make up this thesis.

- Hypothesis 1. Disclosure about the SDGs is higher in municipalities governed by a female mayor.
- Hypothesis 2: Disclosure about the SDGs is higher in municipalities with a higher percentage of female councilors in the municipal plenary.
- Hypothesis 3: Disclosure about the SDGs is higher in municipalities led by older women with a higher percentage of female councilors in the municipal plenary.
- Hypothesis 4. Municipalities where the ruling party has a left-wing ideology are more likely to be committed to the 2030 Agenda and disclose information about their contribution to the SDGs.
- Hypothesis 5. Municipalities with higher levels of political fragmentation are more likely to disclose information on their contribution to the SDGs.

The following table shows the publication(s) in which the hypotheses are addressed.

Table 1. Research hypotheses and associated publications

Hypotheses	Publication
Hypothesis 1. Disclosure about the SDGs is higher in municipalities governed by a female mayor	Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. <i>Cities</i> , 141, 104461
Hypothesis 2: Disclosure about the SDGs is higher in municipalities with a higher percentage of female councilors in the municipal plenary.	
Hypothesis 3: Disclosure about the SDGs is higher in municipalities led by older women with a higher percentage of female councilors in the municipal plenary.	
Hypothesis 4. Municipalities where the ruling party has a left-wing ideology are more likely to be committed to the 2030 Agenda and disclose information about their contribution to the SDGs.	Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. <i>Politics & Policy</i> , 51(5), 800-829
Hypothesis 5. Municipalities with higher levels of political fragmentation are more likely to disclose information on their contribution to the SDGs	

Source: Own elaboration

3 METHODOLOGY

In order to answer the research questions posed in this study, and in line with the defined main objective of the thesis, various qualitative (content analysis) and quantitative analysis (multivariate regressions by using X-STATIS and Tobit for panel data) analytical techniques were used. As indicated earlier, the three articles that make up this thesis share the same sample and research methodology.

Following previous studies (Cuadrado-Ballesteros et al., 2014; Navarro-Galera et al., 2018; Martínez-Córdoba et al., 2020), we focus on large Spanish municipalities, setting this condition based on their population. Two reasons justify this choice. First, large municipalities are more visible in the eyes of stakeholders. Second, large municipalities have the human and technological resources to undertake SDG-related initiatives and disclose information on the SDGs, so it is assumed that they are the municipalities most likely to develop and disclose economic, social, and environmental information (García-Sánchez et al., 2013).

For this purpose, we used the criterion defined in Article 121 of Law 57/2003 (paragraph d), which establishes that large municipalities are those with a population of more than 75,000 inhabitants and with specific historical, cultural, economic, or social circumstances. Taking into account this criterion, a sample of 102 municipalities was obtained.

The study period is 7 years, from 2016 to 2021, covering the period from the entry into force of the 2030 Agenda to the last year for which data was available on the municipal websites. In total, a panel of 612 observations was obtained.

The technique used for data collection was the content analysis, which is a widely used method in research on sustainability and social responsibility (García-Sánchez et al., 2013; Cuadrado-Ballesteros et al., 2014; Navarro-Galera et al., 2015; Ortiz-Rodríguez et al., 2018; Nevado-Gil & Gallardo Vázquez, 2016). The information was obtained from municipal websites. The content analysis was based on a list of 60 items related to the 17 SDGs and their corresponding targets. The following table shows the 60 items based on which the content analysis of the SDG information disclosed on city councils' web pages was analyzed (a similar table can be seen in the three articles that make up the thesis).

Table 2. Information items used for the content analysis.

Item	Description
1	Information on the granting of lunch scholarships for children from families at risk of social exclusion.
2	Information on collects of food and clothing for people at risk of social exclusion carried out by the city council.
3	Information on the AROPE index results.
4	Updated information on year-end statistics on underage obese population.
5	Information on workshops, lectures, and trainings with experts about nutrition and sustainable eating carried out by the city council.
6	Information on grants and subsidies from the city council for agricultural entrepreneurs
7	Information on the rate of underweight babies born in the municipality.

Item	Description
8	Information on the ratio of agricultural employed population compared to other sectors of the municipality.
9	Information on the proportion of land used for agricultural purposes in the municipality.
10	Information on the promotional campaigns carried out by the city council to encourage the consumption of km 0 and local products.
11	Information on the council's childhood obesity awareness campaigns.
12	Information on sport activities organised for the community carried out by the city council.
13	Information on emotional and psychological health activities carried out by the city council.
14	Information on activities for the reduction of adolescent digital dependence carried out by the city council.
15	Information on actions and awareness-raising initiatives to prevent/reduce the consumption of drugs and alcohol among the population carried out by the city council.
16	Information on the number of died persons in the city.
17	Information on the number of fatalities caused by NTDs (e.g., cardiovascular or brain diseases) in the municipality.
18	Information on the number of fatalities due to suicides in the city.
19	Information on life expectancy at birth in the municipality.
20	Information on the child mortality rate (1 year old and under) in the municipality.
21	Information on sexuality talks, seminars, workshops, and awareness-raising activities to prevent the risk of transmission of HIV and AIDS carried out by the city council.
22	Information on digital skills training programmes for residents carried out by the city council.
23	Information on foreign language training carried out by the city council.
24	Information on training courses, talks, and workshops for active aging carried out by the city council.
25	Information on the degree of meeting the needs of the elderly (ratio of residential and day care places available/persons over 64 years of age) in the municipality.
26	Information on the rate of illiterate people in the city.
27	Information on statistics on the usage of municipal libraries.
28	Information on promotional campaigns to enhance the use of municipal libraries carried out by the city council.
29	Information on gender equality plans for the city council's staff.
30	Information on gender equality plans for the population.
31	Information on annual activities conducted about gender equality. Minimum 10 activities in the last year to fulfil the indicator.
32	Information on gender-based violence denunciations are published in the municipality.
33	Information on the rate of protection orders adopted for gender violence victims in the municipality.
34	Information on water management in the municipality including information on savings, consumption, litters recycled, etc.
35	Information on the water management annual plan of the municipality.
36	Yearly data about water quality deficiencies caused by non-justified reasons in the municipality.
37	Information on activities to raise public awareness of responsible water use carried out by the city council.
38	Information of research activities for the detection of diseases and viruses in the municipality's wastewater carried out by the city council.
39	Information on the energy efficiency plan in place in the city.
40	Information on the energy sources used in municipal buildings and street lighting.
41	Information on grants and subsidies for energy transition in communities, homes, and businesses.
42	Information on seminars, training courses, and conferences on energy efficiency and household energy savings carried out by the city council.
43	Information on talks and seminars for the transition to renewable energies carried out by the city council.
44	Information on the municipal energy production (including CHP plants, PV installations for self-consumption, etc.).
45	Information on grant applications for new business start-ups in the municipality.
46	Information on the assistance provided by the city council to entrepreneurs with the formalities and management during the first years of their business.
47	Information of training activities for the employment of people aged 50 and over carried out by the city council.
48	Information on lectures and training programmes for people under 30 years old organized by the city council.
49	Information on workshops and programmes for unemployed people and entrepreneurs organized by the city council.

Item	Description
50	Information on the noise level of the city the municipality.
51	Information of activities carried out by the city council to promote the usage of a more sustainable transport (on foot, by taxi, by electric scooter, by bike, by bus...).
52	Information on the fire prevention plan in place in the municipality.
53	Information on the activities organised by the city council to increase awareness about the importance of protecting nature and recycling.
54	Information on eco-friendly activities (e.g., planting a tree) carried out by the city council.
55	Information on the annual waste generation average per inhabitant in the municipality.
56	Information on household recycling initiatives promoted by the city council through campaigns.
57	The local authority produces and discloses an annual CSR report.
58	Information on the funding details and amounts reimbursed (including at least the funding source and the lender) by the city council.
59	Information on supplier and creditor payments and outstanding invoices.
60	Information on GDP per capita data.

Source: Own elaboration based on the targets established for each SDG and literature review.

Based on the information obtained from the content analysis carried out, the first article grouped the different information items according to the specific SDG to which they are most related. Then, using the X-STATIS technique, a multivariate analysis was carried out to assess the evolution of the commitment to the 2030 Agenda and the disclosure of information on the SDGs by the different municipalities that make up the sample under study, both for each SDG and for each municipality (they were also grouped individually and by region). This analysis allows us to answer the first research question (RQ1: What is the level of commitment of Spanish municipalities to the 2030 Agenda, on which SDGs have they focused their efforts and which ones represent challenges for the future?), although it also partially addresses the second research question (RQ2: What is the level of disclosure of information on the 2030 Agenda and the SDGs by Spanish municipalities and how has it evolved over time?).

For the remaining two articles, the same information was used to construct a disclosure index (which measures, in aggregate form, the degree of disclosure of information on the SDGs by the sampled municipalities over the study period). The index was calculated using the following formula:

$$SDGDI_{i,t} = \frac{\sum_{n=60}^{j=1} Item}{60}$$

Then, in each article were developed statistical models to test the hypotheses posed in relation to the group of factors affecting information disclosure under analysis in this article. These models have the same dependent variable: the disclosure index. In each article, the independent variables refer to the factors analyzed in the corresponding article, while they share a set of control variables representative of other possible factors that condition the commitment to sustainability and information transparency of city councils. For the information related to these variables that was not available on the websites of the city councils, data were obtained from secondary sources (official institutions, national and regional statistical offices, and reports or other studies).

These articles allow us to answer the research questions RQ2 and RQ3 and to test the five research hypotheses related to the research question RQ3. To do this, we use Tobit regression for panel data in both articles.

Additionally, in both articles several complementary analyses were performed by considering the three dimensions of sustainability (environmental, social, and governance), as well as the moderating effect derived from the interactions among factors.

4 DISCUSSION

The adoption of the 2030 Agenda in 2015 by the 193 member states of the United Nations (UN) represented a paradigm shift and a strengthening of the commitment to achieve full sustainability of the planet, and was one of the most important milestones in recent decades (Tsalis et al., 2020). The Sustainable Development Goals (SDGs) emerged as the successor to the Millennium Development Goals adopted in 2000, broadening the scope of action and involving all economic actors in their fulfilment (Verboven & Vanherck, 2016; Mutiarani & Siswantoro, 2020).

Indeed, given the universal nature of the 2030 Agenda and the SDGs, and under the motto “leave no one behind”, the participation of all economic agents is required to achieve the agreed commitments. In particular, public administrations have a paramount role to play, as they are responsible for designing and promoting public policies aimed at protecting the natural environment, promoting economic growth and improving the well-being of society (Rios et al., 2022). In particular, due to their proximity to citizens, local governments are called upon to play a significant role by directly or indirectly influencing the achievement of the SDGs.

This commitment of local governments to the 2030 Agenda requires the disclosure of information to different stakeholders on their contribution to the Sustainable Development Goals, with a dual focus (Marcuccio & Steccolini, 2005; Navarro-Galera et al., 2018): (i) public responsibility, as a demonstration of an entity’s commitment to sustainable development and the actions taken in this regard, and (ii) sustainability, as a means to move towards a more equitable and sustainable society (Martínez-Córdoba et al., 2020; Masuda et al., 2021).

Given that the decision to disclose sustainability information is optional for Spanish local governments, it is logical to assume that socioeconomic, political, and demographic factors will not only determine the design and implementation of local policies related to the 2030 Agenda and the Sustainable Development Goals (Guillamón et al., 2011; García-Sánchez et al., 2013; Ribeiro et al., 2016; Rodríguez-Bolívar et al., 2018; Aguilera et al., 2021), but also the disclosure of information in this regard (Martínez-Córdoba et al., 2021c; Cheng et al., 2021; Hartanto & Siregar, 2021; Padeiro et al., 2021).

Although the literature has analyzed the role of local entities in achieving sustainable development and the disclosure of sustainability information, as well as its determinants (Guillamón et al., 2011; García-Sánchez et al., 2013; Ribeiro et al., 2016; Navarro-Galera et al., 2018; López-Subires et al., 2019), no research has yet been conducted on the disclosure of information related to the 2030 Agenda and the SDGs by local entities, which contrasts with the remarkable interest that the study of these issues in the private sector has generated among academics and practitioners (Garrido-Ruso et al., 2022).

With the aim of filling this important gap in the literature, the three articles that make up this research project analyzed the commitment of Spanish local governments to the 2030 Agenda and the extent to which they disclose information on the SDGs, as well as the factors that drive SDG reporting by Spanish local governments.

Overall, the findings from the three articles that make up the thesis show that the commitment of Spanish local governments to the 2030 Agenda is low. Furthermore, the analysis performed in such articles show that, on average, the level of disclosure of SDG information by large Spanish municipalities during the period analysed is low, with only 22 items out of a total of 60 items considered, ranging between 6 and 49 items. As can be seen in Figure 2, the dispersion of the values is low, that is, the values are concentrated between 15 and 30 items of information available on their websites, on average over the period analyzed.

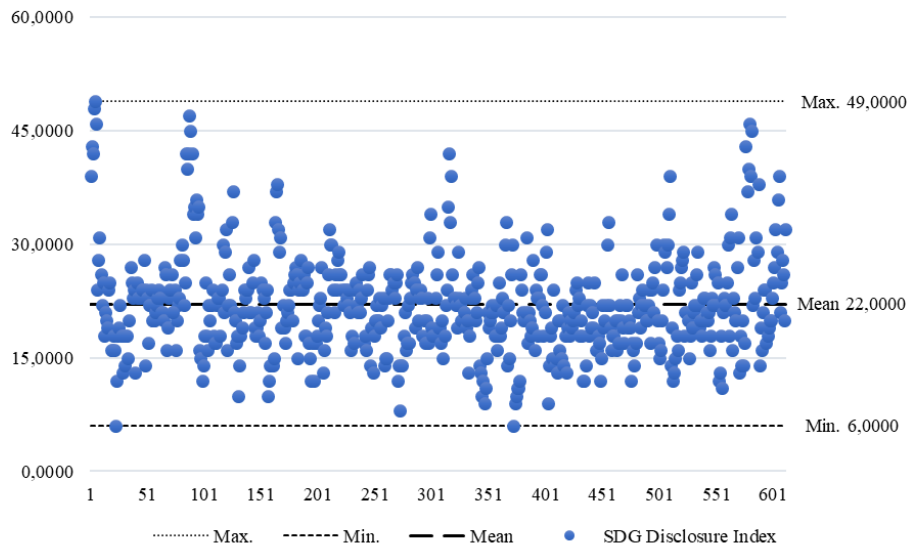


Figure 2. Dispersion of the SDG Disclosure Index

Nevertheless, the level of SDG disclosure showed a notable increase during the study period (2016-2021), suggesting a strengthening of the commitment of Spanish local governments to the 2030 Agenda and SDG disclosure. In this evolution, the COVID-19 pandemic marked a turning point, as it implied a greater emphasis by city councils on those SDGs that are more related to people and prosperity, as well as greater transparency. In terms of the drivers of SDG reporting, the results obtained in the three articles that make up the thesis show a significant positive relationship between the level of disclosure of SDG information by local governments and some socio-demographic factors that characterize municipalities. Specifically, the municipalities that are the largest in terms of population and those with a higher percentage of dependent population are the Spanish city councils that disclose more SDG information. In addition, the gender of the mayor of a city council has a positive influence on the transparency of local governments in relation to the 2030 Agenda, with those city councils led by a female mayor more likely to disclose information on the 2030 Agenda and the SDGs, especially in relation to social and governance issues. Finally, a significant influence of the political ideology of the ruling party of the city council was found, with city councils ruled by left-wing parties showing higher levels of SDG information disclosure than those ruled by right-wing parties.

4.1 COMPLEMENTARY ANALYSES

According to the results of the first article that makes up the tesis (Rieiro-García, M., Amor-Esteban, V., & Aibar-Guzmán, C. (2023). 'Localizing' the sustainable development goals: A multivariate analysis of Spanish regions. *AIMS Environmental Science*, 10(3),

356–381), 9 municipalities stand out as the most committed to the 2030 Agenda and the SDGs. These municipalities are A Coruña, Barcelona, Bilbao, Donostia, Madrid, Santander, Valencia, Valladolid and Vitoria-Gasteiz. On the other hand, 4 of the 102 municipalities analysed in this thesis stand out as the least committed to the 2030 Agenda and the SDGs. They are Avilés, Lugo, Pontevedra and Telde. In terms of population, the first group includes many of Spain’s largest cities (e.g., Madrid, Barcelona, and Valencia), while the second group is made up of smaller cities.

Table 3 reflects the values that the political factors analyzed in the other two articles that make up the thesis (i.e., gender of the mayor and political ideology of the party that governs the city council) take for these 13 municipalities. Given that the Spanish municipal elections were held on May 26, 2019, which in many municipalities meant a change in the ideological sign of the governing party and the gender of the mayor, in Table 3 we have divided the study period (2016-2021) into two subperiods: the first from 2016 to May 2019 and the second from June 2019 to 2021.

Table 3. Characterization of Spanish city councils that are more or less committed to the 2030 Agenda and the SDGs, in terms of the gender of their mayor and the political ideology of the governing party.

Municipality		2016 - May 2019		June 2019 - 2021	
		Gender of the mayor	Ideology of the ruling party	Gender of the mayor	Ideology of the ruling party
Most committed	A Coruña	Man	Left-wing	Woman	Left-wing
	Barcelona	Woman	Left-wing	Woman	Left-wing
	Bilbao	Man	Left-wing	Man	Left-wing
	Donostia	Woman	Left-wing	Man	Left-wing
	Madrid	Woman	Left-wing	Man	Right-wing
	Santander	Woman	Right-wing	Woman	Right-wing
	Valencia	Man	Left-wing	Man	Left-wing
	Valladolid	Man	Left-wing	Man	Left-wing
	Vitoria-Gasteiz	Man	Left-wing	Man	Left-wing
Least committed	Avilés	Woman	Left-wing	Woman	Left-wing
	Lugo	Woman	Left-wing	Woman	Left-wing
	Pontevedra	Man	Left-wing	Man	Left-wing
	Telde	Woman	Left-wing	Woman	Left-wing

Source: Own elaboration

As indicated above, according to the second article that makes up the thesis (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. *Cities*, 141, 104461) those city councils led by a female mayor more likely to disclose information on the 2030 Agenda and the SDGs, whereas according to the third article that makes up the thesis (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. *Politics & Policy*, 51(5), 800-829) city councils ruled by left-wing parties showing higher levels of SDG information disclosure than those ruled by right-wing parties. However, this association is only confirmed for one of the nine most committed municipalities identified in Table 3: Barcelona, which had a female mayor and was governed by a left-wing party throughout the period. Four of the most committed municipalities (Bilbao, Valencia, Valladolid and Vitoria-Gasteiz) were governed by a male mayor with a left-wing ideology, and in two others (A Coruña and Donostia) the gender of the mayor changed in the 2019 municipal elections, although the political ideology of the ruling party did not change (it was left-wing throughout the six years of

the study). In addition, Santander was governed by a woman with a right-wing ideology throughout the study period.

There is a special case that deserves a separate comment: Madrid, which was governed by a woman with a left-wing ideology in the first subperiod, but by a man with a right-wing ideology in the second. However, according to the results of the first article constituting the thesis, Madrid stands out as the city most committed to the 2030 Agenda and the disclosure of information on the SDGs, with this commitment increasing over the period, despite the change of government in the city council. On the other hand, three of the four municipalities least committed to the 2030 Agenda and the SDGs (Avilés, Lugo, and Telde) were governed by a woman with a left-wing ideology throughout the study period, while Pontevedra was governed by a man with a left-wing ideology.

These results lead us to believe that, in addition to the notable influence of the gender of the mayor and the political ideology of the party governing the city council on the commitment to the 2030 Agenda and the disclosure of information on the SDGs, there are other factors, particularly related to the demographic and socioeconomic characteristics of the municipality, that also have a significant impact on the commitment of the city council to the 2030 Agenda and the SDGs.

Thus, given that, according to the three articles that make up this thesis, the demographic characteristics of local governments have a significant impact on the implementation of SDG-related actions and strategies (Guillamón et al., 2011; Ribeiro et al., 2016; Rodríguez-Bolívar et al., 2018), it may be worthwhile to delve deeper into the analysis of the influence of these factors on the disclosure of SDG information by large Spanish municipalities. In this regard, six demographic factors (population, percentage of dependent population, population density, percentage of foreign population, and unemployment rate) have been identified based on the analysis carried out in the three articles that make up the thesis and the literature review. These factors condition both the main challenges and pressures faced by local governments in relation to the SDGs, and could therefore have a significant impact on SDG reporting.

To test their impact on local governments' commitment to SDG disclosure, the following model is proposed:

$$SDGDI_{i,t} = \beta_0 + \beta_1 * popu_{i,t} + \beta_2 * pdep_{i,t} + \beta_3 * pden_{i,t} + \beta_4 * foreign_{i,t} + \beta_5 * unemp_{i,t} + \beta_6 * budget_{i,t} + \beta_7 * mgen_{i,t} + \beta_8 * wcoun_{i,t} + \beta_9 * mideo_{i,t} + \beta_{10} * hhi_{i,t} + \beta_{11} * pcovid_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \text{ [Equation 1]}$$

As can be seen, the model represented by Equation 1 has the same dependent variable as the models used in the three articles that make up the thesis. In this case, the control variables are the gender and political ideology factors analyzed in those articles. In addition, given that a municipality's budgetary resources affect its ability to implement sustainability initiatives and disclose related information, as noted by García-Sánchez et al. (2013) and Bardal et al. (2021), we include the city council's annual budget, measured as the budget (in millions of euros) per 1,000 inhabitants (*budget*), as a control variable. Finally, given the disruption caused by the COVID-19 pandemic in municipal management, which forced them to redesign the delivery of services to citizens, reformulate public policies and increase transparency (Mejía-Dugand et al., 2020; Bilsky et al., 2021), we include the *pcovid* variable as a measure of the impact of this period on municipal management and SDG reporting. The effect of this variable was demonstrated in the first article that makes up the thesis and analysed (also as a control variable) in the third article.

The independent variables included in the model presented in Equation 1 refer to the demographic characteristics of the municipalities mentioned above. The first variable included is the population variable (*popu*), which represents the size of the cities, measured as the natural logarithm of the population (Puron-Cid & Rodríguez Bolívar, 2018; Ríos et al., 2018; Rodríguez-Bolívar et al., 2018; López-Subires et al., 2019; Gaia & Jones, 2020; Tavares & da Cruz, 2020). The second variable is the dependent population (*pdep*), measured as the percentage of the population under 16 years and over 64 years in relation to the population between 16 and 64 years (Navarro-Galera et al., 2018, 2019). The third variable, closely related to the size of the population, is the population density (*pden*), measured as inhabitants per square kilometer of municipal area (in Napierian logarithm) (López-Subires et al., 2019; Cabaleiro-Casal & Buch-Gómez; 2020; Martínez-Córdoba et al., 2020). The fourth demographic variable is the percentage of foreign population living in the municipality (*foreign*) (Alcaraz-Quiles et al., 2015; Navarro-Galera et al., 2018). Finally, we consider the municipality's unemployment rate (*unemp*) (Alcaraz-Quiles et al., 2015; Araujo & Tejedero-Romero, 2018).

Based on the same data as the three articles that make up the thesis and again using a Tobit regression for panel data, the results of the estimation of Equation 1 are presented in Table 4. As can be seen, the size of the population (*popu*), it has a significant positive impact on the disclosure of information on the SDGs (coeff. =0.0722625), with 99% confidence, which indicates that in those municipalities that are larger in terms of population, there is a tendency towards greater disclosure of information on the SDG. This result confirms the conclusions of the first article that makes up the thesis (Rieiro-García, M., Amor-Esteban, V., & Aibar-Guzmán, C. (2023). 'Localizing' the Sustainable Development Goals: A multivariate analysis of Spanish regions. *AIMS Environmental Science*, 10(3), 356-381), in which the most populous cities are also among the most committed municipalities. Moreover, this result is consistent with the findings of the study conducted by Citro et al. (2021), who found a positive relationship between municipal transparency and population size.

With regard to the proportion of dependent population (*pdep*), we find a positive and significant impact on the disclosure of SDG information (coeff. =0.3619298), with a confidence level of 99%, suggesting that municipalities with a higher percentage of dependent population have greater disclosure of information on the SDGs. This result is in line with that obtained by Alcaraz-Quiles et al. (2015), who also found that the transparency of information on sustainability was influenced by the percentage of dependent population in the municipality.

The effect of population density on SDG reporting (*pden*) is significant but negative (coeff. =-0.0062198), at the 90% confidence level. This result indicates that when population density is higher, local governments are more committed to disclosing a greater volume of information on the SDGs. This result is consistent with that obtained by Ortiz-Rodríguez et al. (2018), who find that an increase in population density leads to an increase in information disclosure by local governments.

The percentage of foreign population (*foreign*) residing in the municipality was found to have a significant positive influence on SDG reporting (coeff. =0.182587), with a confidence level of 99%, suggesting that the higher the percentage of foreign population residing in the municipality relative to the total population, the greater the volume of information on the SDGs disclosed by the local entity. This result is consistent with that of Rodríguez Bolívar et al. (2021), who found a significant relationship between the immigrant population and financial transparency. Finally, in the case of the unemployment rate (*unemp*), although the sign of the association is negative, it has no

significant effect on the disclosure of information on the SDGs by large Spanish municipalities.

Additionally, as in the third article that makes up the thesis (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. *Politics & Policy*, 51(5), 800-829), we find that the amount of SDG information disclosed is greater in the years of the study period affected by the COVID-19 pandemic and in municipalities governed by a party with a leftist ideology (coeff. =0.0395928 and coeff. =0.0280148, respectively), at a confidence level of 99%. Similarly, confirming the findings of the second article that makes up this thesis (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. *Cities*, 141, 104461), municipalities governed by women (coeff. =0.0251626) disclose more information on the SDGs.

Table 4. Complementary results (I)

Variable	Coeff. (Std. Dv.)
popu	0.0722625*** (0.0057874)
pdep	0.3619298*** (0.0743501)
pden	-0.0062198* (0.035115)
foreign	0.182587*** (0.0499745)
unemp	-0.0224168 (0.0812466)
budget	0.0061521 (0.0096826)
mgen	0.0298234*** (0.0086595)
wcoun	0.1111769 (0.0773944)
mideo	0.0280148*** (0.0085558)
hhi	-0.0273214 (0.0426637)
pcovid	0.0395928*** (0.0136512)
Constant	-0.7508253*** (0.0883902)
Year controlled	
Rho = 0.0192141	
Log likelihood = 594.15184	
p-value = 0.0000	
Significance: *** p<0.01; ** p<0.05; * p<0.10	

In line with the analyses carried out in the second and third articles, in order to deepen these findings, Equation 1 is divided into three new equations (equations 2, 3 and 4), in which the dependent variable (SDGDI) has been segmented into three sub-variables according to the three dimensions of sustainability: environmental (SDGDIe), social (SDGDIs) and governance (SDGDIg) as follows:

$$SDGDIe_{i,t} = \beta_0 + \beta_1 * popu_{i,t} + \beta_2 * pdep_{i,t} + \beta_3 * pden_{i,t} + \beta_4 * foreign_{i,t} + \beta_5 * unemp_{i,t} + \beta_6 * budget_{i,t} + \beta_7 * mgen_{i,t} + \beta_8 * wcoun_{i,t} + \beta_9 * mideo_{i,t} + \beta_{10} * hhi_{i,t} + \beta_{11} * pccovid_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \text{ [Equation 2]}$$

$$SDGDIs_{i,t} = \beta_0 + \beta_1 * popu_{i,t} + \beta_2 * pdep_{i,t} + \beta_3 * pden_{i,t} + \beta_4 * foreign_{i,t} + \beta_5 * unemp_{i,t} + \beta_6 * budget_{i,t} + \beta_7 * mgen_{i,t} + \beta_8 * wcoun_{i,t} + \beta_9 * mideo_{i,t} + \beta_{10} * hhi_{i,t} + \beta_{11} * pccovid_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \text{ [Equation 3]}$$

$$SDGDIG_{i,t} = \beta_0 + \beta_1 * popu_{i,t} + \beta_2 * pdep_{i,t} + \beta_3 * pden_{i,t} + \beta_4 * foreign_{i,t} + \beta_5 * unemp_{i,t} + \beta_6 * budget_{i,t} + \beta_7 * mgen_{i,t} + \beta_8 * wcoun_{i,t} + \beta_9 * mideo_{i,t} + \beta_{10} * hhi_{i,t} + \beta_{11} * pccovid_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \text{ [Equation 4]}$$

The results of the analysis are shown in Table 5. In terms of environmental information, municipalities with a larger population (coeff. =0.0161004), a higher proportion of dependent population (coeff. =0.0566797), and a higher proportion of foreign residents (coeff. =0.1086199) tend to have a higher disclosure of environmental information related to the SDGs through their websites. Conversely, a higher population density (coeff. =-0.003457) has a negative impact on the disclosure of environmental information related to the SDGs.

On the other hand, with regard to social information, its disclosure is higher in municipalities with a higher population (coeff. =0.0496596) and a higher proportion of dependent population (coeff. =0.2998548). However, as for the third dimension of sustainability, information on governance issues, we find no significant association between its disclosure and the demographic factors considered in this analysis.

Table 5. Complementary results (II)

Equation	SDGDI Eq.1	SDGDIe Eq.2	SDGDIs Eq.3	SDGDIg Eq.4
	Coeff. (Std. Dv.)	Coeff. (Std. Dv.)	Coeff. (Std. Dv.)	Coeff. (Std. Dv.)
popu	0.0722625*** (0.0057874)	0.0161004*** (0.0024841)	0.0496596*** (0.0043264)	0.006542*** (0.0008191)
pdep	0.3619298*** (0.0743501)	0.0566797* (0.0318586)	0.2998548*** (0.0553954)	0.0098739 (0.0104598)
pden	-0.0062198* (0.0035115)	-0.003457** (0.0015055)	-0.0028603 (0.0026255)	0.000102 (0.0004949)
foreign	0.182587*** (0.0499745)	0.1086199*** (0.0214564)	0.0581192 (0.0373532)	0.0123484* (0.0070592)
unemp	-0.0224168 (0.0812466)	0.045187 (0.0347737)	-0.0926613 (0.0607811)	0.0139201 (0.0109853)
budget	0.0061521 (0.0096826)	-0.011223*** (0.004154)	0.0152159** (0.0072391)	0.0028031*** (0.0013677)
mgen	0.0298234*** (0.0086595)	0.0017208 (0.0037172)	0.0270258*** (0.0064738)	0.0011516 (0.0012256)
wcoun	0.1111769 (0.0773944)	0.0248028 (0.0331917)	0.0835128 (0.0578437)	0.0074551 (0.109124)
mideo	0.0280148*** (0.0085558)	0.002366 (0.0036712)	0.025211*** (0.0063957)	-2.76e-06 (0.0012099)
hhi	-0.0273214 (0.0426637)	0.0143902 (0.0182658)	-0.024004 (0.0319014)	-0.0170949*** (0.0060014)
pcovid	0.0395928*** (0.0136512)	0.0011476 (0.0044538)	0.0435712*** (0.0098813)	-0.0048069*** (0.0011346)
Constant	-0.7508253*** (0.0883902)	-0.1137661*** (0.0378467)	-0.5609388*** (0.0660331)	-0.0785666*** (0.0124241)
Year controlled				
Rho	0.0192141	0.0069133	0.0174141	1.31e-20
Log likelihood	594.15184	1,113.3467	772.38707	1,793.7037
p-value	0.0000	0.0000	0.0000	0.0000
Significance: *** p<0.01; ** p<0.05; * p<0.10				

Additionally, according to the results presented in Table 5, in municipalities governed by a woman and those governed by a left-wing party, there is a tendency towards greater disclosure of information on social SDGs, while a higher level of political competition in a municipality negatively affects the disclosure of governance information. With regard to the gender of the mayor, this result confirms that obtained in the second article that makes up this thesis (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. *Cities*, 141, 104461), although in this article the gender of the mayor also positively affects the disclosure of governance information. With regard to the political ideology of the governing party, this result confirms that obtained in the third article that makes up the thesis (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. *Politics & Policy*, 51(5), 800-829), although again we only found a significant effect on the disclosure of social information, while in the article the significant effect is found for both social and governance information. On the other hand, the result regarding the influence of the level of political competition of municipalities differs from that obtained in the latter article, where political competition negatively affects the disclosure of social information.

Despite the fact that, according to the results of Table 4, the city council budget does not significantly affect the disclosure of information on the SDGs by the municipalities in the sample, considering that the availability of resources by a city council conditions its ability to carry out the different initiatives related to the 2030 Agenda and the disclosure

of information in this regard (García-Sánchez et al, 2013; Bardal et al., 2021) to complete the analysis we analyze how the city council budget moderates the effect of the different demographic variables on the disclosure of information on the SDGs by large Spanish municipalities. Thus, Equation 5 represents the model designed to contrast the moderating effect of the city council budget.

$$SDGDI_{i,t} = \beta_0 + \beta_1 * popu_{i,t} + \beta_2 * popu_{i,t} * budget_{i,t} + \beta_3 * pdep_{i,t} + \beta_4 * pdep_{i,t} * budget_{i,t} + \beta_5 * pden_{i,t} + \beta_6 * pden_{i,t} * budget_{i,t} + \beta_7 * foreign_{i,t} + \beta_8 * foreign_{i,t} * budget_{i,t} + \beta_9 * unemp_{i,t} + \beta_{10} * unemp_{i,t} * budget_{i,t} + \beta_{11} * budget_{i,t} + \beta_{12} * mgen_{i,t} + \beta_{13} * wcoun_{i,t} + \beta_{14} * mideo_{i,t} + \beta_{15} * hhi + \beta_{16} * pcovid_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \text{ [Equation 5]}$$

Table 6 shows the results of the estimation of the model proposed in Equation 5. As can be seen, the interaction between population and budget has a significant positive effect on the volume of SDG information disclosed by municipalities (coeff. =0.0474523), at a 99% of confidence. This suggests that the propensity of more populous city councils to disclose SDG information is enhanced by their availability of financial resources, as measured by their annual budget.

With respect to population density (*pden*), while it individually has a negative and significant effect on SDG reporting (coeff. =-0.0406322), at 99% confidence level, its interaction with the budget variable has a positive and significant effect (coeff. =0.0383136), at 99% confidence level, indicating that the fact that a municipality has more financial resources modifies the individual effect of population density by facilitating the disclosure of SDG information.

Conversely, both the percentage of foreign population and the unemployment rate individually have a significant positive impact on SDG disclosure (coeff. = 0.8248022 and coeff. =1.060178, respectively), at 99% confidence level, but their interaction with the municipal budget has a negative significant impact (coeff. =-0.5772228 and coeff. =-0.8264201, respectively), at 99% confidence level. These findings indicate that the individual impact of these demographic factors is higher than their joint effect with the municipal budget, or, in other words, that the availability of financial resources by the municipality, measured by its annual budget, paradoxically reduces the positive individual impact of the percentage of foreign population and the unemployment rate on SDG reporting.

With regard to the percentage of dependent population (*pdep*), it has a negative but non-significant individual impact on the disclosure of SDG information (coeff. =-0.1661295), but when it is interacted with the budget variable, this effect becomes positive but remains non-significant (coeff. =0.428933).

Table 6. Complementary results (III)

Variable	Coeff. (Std. Dv.)
popu	0.001243 (0.0218802)
popu*budget	0.0474523*** (0.0173412)
pdep	-0.1661295 (0.3614652)
pdep*budget	0.428933 (0.3409717)
pden	-0.0406322*** (0.0119878)
pden*budget	0.0383136*** (0.0120484)
foreign	0.8248022*** (0.2098642)
foreign*budget	-0.5772228*** (0.1844294)
unemp	1.060178*** (0.2760412)
unemp*budget	-0.8264201*** (0.2295147)
budget	-0.8429774 (0.2720564)
mgen	0.0251626*** (0.0084598)
wcoun	0.07298083 (0.0741122)
mideo	0.0248771*** (0.0081991)
hhi	-0.0353553 (0.0407254)
pcovid	0.0375478* (0.0146295)
constant	0.3708289 (0.3195493)
Year controlled	
Rho = 0.0271509	
Log likelihood = 626.74565	
p-value = 0.0000	
Significance: *** p<0.01; ** p<0.05; * p<0.10	

4.2 CONTRIBUTION TO THE LITERATURE

This research project makes a valuable contribution to the existing literature on the implementation of the 2030 Agenda in the public sector, especially at the local level, and has important theoretical and practical implications. Several studies have been conducted that focus on how local governments move towards sustainable development and the disclosure of sustainability information, as well as the determinants of sustainability reporting (e.g., Guillamón et al., 2011; García-Sánchez et al., 2013; Ribeiro et al., 2016; Navarro-Galera et al., 2018; López-Subires et al., 2019). Nevertheless, to date and to the best of our knowledge, no comprehensive research has been conducted on the disclosure of information specifically related to the 2030 Agenda and the SDGs by city councils. Therefore, this thesis contributes to the literature in several ways:

1. by providing an overview of the status and dynamic evolution of the commitment of large Spanish local governments to the 2030 Agenda and SDG reporting, and by outlining possible socio-demographic factors that may influence them. This analysis is particularly useful because, due to the complexity and breadth of the SDGs, it is difficult to conduct a homogeneous analysis of the initiatives undertaken by municipalities to achieve them.
2. by improving the current understanding of the determinants of sustainability disclosure by local governments, taking into account a wide range of political-institutional, organizational and socio-economic factors that condition their activities.
3. by contributing to the current debate on the substantive representation of women in local politics, demonstrating that they bring a "distinct voice" to local governance that promotes both sustainability and transparency. In doing so, this research responds to recent calls to improve understanding of the role of women in positions of leadership in advancing the 2030 Agenda by providing empirical evidence on the local public sector.
4. by providing novel empirical evidence to the ongoing debate on the influence of government ideology on public policy. Thus, the research shows that the ideology of the ruling party in a city council influences the level of commitment to the 2030 Agenda and the SDGs, as well as the disclosure of information about actions taken to achieve them, and that this influence is moderated by the level of political fragmentation that exists in the city council.
5. by proposing a new way of measuring the contribution to the 2030 Agenda, specifically adapted to the role of local entities in this regard, which assesses the extent to which municipalities implement and disclose information on the SDGs through an index calculated from the sum of 60 items representing initiatives related to the SDGs. This methodology complements other indices, such as those developed by the Sustainable Development Solutions Network (SDSN) and can be applied to other countries and adapted to higher levels of government (e.g., regional, national).
6. by exploring the impact of the COVID-19 pandemic on the management of local governments and their progress towards the SDGs, as well as the impact it has had on the disclosure of information related to the 2030 Agenda by local governments.

On a practical level, the results can help public authorities and citizens to understand the level of sustainability of regions and municipalities, assess their performance in relation to different dimensions of sustainability, and identify key challenges for future improvement. The measurement of progress towards the SDGs is a very important benchmarking tool for local authorities, as it allows each city to compare its progress towards the goals with that of other similar cities, both within the same country and around the world. In this way, this research can be useful for mayors and city leaders in our country to identify areas where they should prioritize their sustainability-related policies and actions. It should also be useful for local government authorities to identify other cities with similar situations and challenges, and to facilitate exchanges at national and international levels on how to accelerate progress towards achieving the 2030 Agenda.

In particular, the findings can guide regulators and policymakers in designing policies to improve SDG performance in municipalities and regions with the lowest levels of commitment, as well as which SDGs should be emphasized by public policies. In this sense, the findings highlight the importance of promoting gender diversity for the achievement of the 2030 Agenda and provide important reasons to promote the participation of women in politics.

4.3 IMPLICATION OF THE FINDINGS

4.3.1 Theoretical implications

With the adoption of the 2030 Agenda and the SDGs, a new paradigm has emerged in academic research on sustainability (Garrido-Ruso et al., 2023). This research project contributes to this new paradigm emerging in academic research on sustainability, highlighting the crucial role of local governments as key actors in implementing the commitments of the 2030 Agenda and achieving the SDGs. In this regard, the main theoretical implications of the findings of the three articles that make up this thesis can be summarized as follow.:

The results of the first article (Rieiro-García, M., Amor-Esteban, V., & Aibar-Guzmán, C. (2023). 'Localizing' the Sustainable Development Goals: A multivariate analysis of Spanish regions. *AIMS Environmental Science*, 10(3), 356-381) support the usefulness of stakeholder theory and institutional theory as theoretical frameworks to explain local government engagement with the 2030 Agenda. According to the tenets of these theoretical frameworks, by determining the strength of stakeholder and institutional pressures that local governments face in relation to sustainability and the SDGs, both socio-demographic and cultural factors influence the implementation of initiatives related to the achievement of the SDGs by local governments, as well as the disclosure of information related to these initiatives and their results to citizens and other stakeholders. In this sense, the findings of this article show that differences in terms of geographical, demographic and economic characteristics influence the main challenges faced by local governments in implementing public policies related to the 2030 Agenda, which in turn affect the extent and type of information on the SDGs reported by local governments.

The findings of the second article (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. *Cities*, 141, 104461) provide empirical support for social role theory by demonstrating that female politicians behave in accordance with their gender stereotypes, thereby promoting greater transparency with respect to a municipality's commitment to the 2030 Agenda and the SDGs. In line with upper echelons theory, the results of this paper show that the demographic characteristics of the mayor of a local council (in this case, the gender of the mayor) influence the level of transparency of her or his municipality with respect to the SDGs. Furthermore, in line with the tenets of resource dependence theory, the results show that female councilors bring unique skills, knowledge, and experience to their municipalities, which has a positive impact on SDG engagement and reporting.

Finally, the findings of the third article (Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. *Politics & Policy*, 51(5), 800-829) contribute to issue ownership theory and institutional theory by demonstrating that the fact that political parties consider themselves as "owners" of the 2030 Agenda outweighs the pressure from the institutional environment regarding the implementation of actions aimed at achieving the SDGs and the disclosure of information about the initiatives undertaken to achieve them.

4.3.2 Practical implications

On a practical level, the results of this thesis can help public authorities, citizens and regulators to understand the level of sustainability of municipalities, to evaluate their performance in relation to the different dimensions of sustainability (i.e., environmental, social and governance) and to identify the main challenges for future improvement and how to address them.

The findings of the first article can guide regulators and policymakers in the design of policies aimed at improving SDG performance in municipalities and regions with the lowest levels of commitment and transparency, as well as which SDGs should be emphasized in public policies. In particular, large Spanish municipalities should improve their performance on actions related to gender equality, clean water and sanitation, and partnerships, and the Spanish national government should prioritize investments in lagging regions and municipalities to improve their levels of commitment to the SDGs and reduce inequalities.

The findings of the second article highlight the importance of promoting gender diversity at the local government level for the achievement of the 2030 Agenda and the SDGs. As such, they provide an important rationale for promoting women's participation in politics. On the other hand, the findings in the third article allow us to understand the extent to which differences in the views and values of local governments related to the political ideology of political parties affect their commitment to the SDGs or, on the contrary, whether the commitment to the 2030 Agenda transcends the political ideology of the party in power.

Finally, the low level of disclosure of information on the SDGs by large Spanish municipalities suggests that there is still a long way to go to achieve transparency in this area, and in this sense, the index proposed in this thesis can help public officials and citizens to assess the current situation and guide them in this regard.

4.4 LIMITATIONS OF THE STUDY

This research has two main limitations. First, the study is limited to a specific geographic context, focusing on a single country, Spain, which may limit the generalizability of the results to other contexts (e.g., less polarized countries or countries less committed to gender equality and sustainability.). Second, the small sample size (102 municipalities) and the focus on large municipalities may bias the results and conclusions, leading to equivocal findings, as lack of resources in municipalities with less than 75,000 inhabitants may reduce the disclosure of information on the issue.

4.5 SUGGESTIONS FOR FUTURE RESEARCH

The limitations mentioned above at the same time open the way to new opportunities for further research in this area. First, future studies could extend the scope of the analysis to other countries and include a larger number of municipalities. Second, future studies could also use econometric models to analyze the influence of the sociodemographic factors mentioned in this paper on the degree of commitment to the Sustainable Development Goals of local councils. Third, this study carried out in the first paper could be replicated using other quantitative methods, such as multi-criteria decision analysis (MCDA). Finally, the analysis could be extended by considering the profiles of women mayors and councillors (age, educational background, tenure, etc.) as well as additional explanatory variables.

5 CONCLUSIONS

In light of the results achieved by the Millennium Development Goals (MDGs) and their limited scope, the 193 member states of the United Nations decided to adopt the 2030 Agenda for Sustainable Development in September 2015. Given their proximity to the people, local governments have a key role to play in achieving the 2030 Agenda by integrating the Sustainable Development Goals (SDGs) into their policies and programs. This commitment of local governments to the 2030 Agenda includes disclosing information to different stakeholders on their contribution to the SDGs, both as an exercise of public accountability and to raise awareness of the need to move towards a more just and sustainable society.

This thesis aimed to analyze, from different perspectives, the factors that influence the amount of information disclosed by Spanish municipalities in the period 2016-2021, with the aim of having an analytical basis for the implementation and monitoring of the fulfillment of the SDGs. Thus, based on the hypothesis that the disclosure of information on the 2030 Agenda and the SDGs by municipalities, given its voluntary nature, shows different patterns depending on the context, and that there are therefore factors (socio-economic, political and demographic) that positively or negatively influence the disclosure of such information, the main objective of this research was to assess the commitment of Spanish municipalities to the 2030 Agenda and the extent to which they disclose information on the SDGs, as well as to identify the drivers of SDG reporting. Specifically, it sought to answer the following three research questions:

- RQ1: What is the level of commitment of Spanish local governments to the 2030 Agenda, on which SDGs have they focused their efforts and which ones represent challenges for the future?
- RQ2: What is the level of disclosure of information on the 2030 Agenda and the SDGs by Spanish local governments, and how has it evolved over time?
- RQ3: What socio-economic, political and demographic factors influence the disclosure of information on the SDGs by Spanish local governments and how do they affect it?

In order to achieve the research objectives and answer the research questions, this thesis consists of three articles published in journals indexed in JCR or Scopus, each of which answers one or more of the three research questions posed in the research project. These articles share the same sample and research methodology and are in line with what was established in the research plan on which the thesis is based. Thus, the first article answers the first research question (RQ1) by analyzing the current situation regarding the commitment of Spanish local governments to the 2030 Agenda and its evolution over the period 2016-2021, while the next two articles answer the last two research questions by analyzing the degree of disclosure of information about the 2030 Agenda by Spanish city councils (RQ2) and the factors that determine it (RQ3). In this way, we provided an overview of the situation of the Spanish local public sector with regard to the 2030 Agenda and identified the main determinants of transparency in this regard.

The main results of the analysis carried out in the three papers that make up this thesis are summarized below.

In the first article, the current state of commitment to the 2030 Agenda at the local level, as measured by the information on SDG-related initiatives disclosed by local governments through their websites, was analyzed in order to identify the main priorities of their government agendas and the challenges to achieving the commitments of this global agenda by 2030. From the content analysis of the websites of 102 Spanish municipalities for the period 2016-2021, and considering 60 information items related to actions aligned with the 2030 Agenda and the SDGs that can be carried out at the local level (balanced panel of 612 observations), the X-STATIS technique was applied to perform a multivariate analysis. The main results obtained are the following:

- Regarding the commitment to the disclosure of information on the SDGs, the results show that the commitment of Spanish municipalities to the SDGs is low (37.2% on average), although there is a notable increase during the period of analysis from 34.4% in 2016 to 43.1% in 2021, suggesting a strengthening of the commitment of local governments to the 2030 Agenda and the disclosure of information in this regard.
- Likewise, a turning point is observed in 2019, distinguishing two distinct phases within the study period: 2016-2019 and 2020-2021. This can be attributed to the paradigm shift that the pandemic marked by COVID-19 represented in the decisions and actions to be prioritized by local governments to preserve the security of citizens, as well as in the disclosure of information through their digital channels. Specifically, the COVID-19 pandemic has marked a turning point in this regard, with greater importance being given to those SDGs that are more related to people and prosperity.
- Regarding the most prioritized goals, the results show a greater commitment to SDG8 and SDG11, followed by SDG3, SDG4 and SDG13-15, as priorities in the agendas of local governments. On the opposite side, SDG5, SDG6 and SDG17 were identified as the least prioritized SDGs, and the information disclosed about them decreased over the period. This prioritization suggests that local governments have shown more preference for social and environmental issues, leaving aside governance issues.
- A significant positive relationship was found between the level of disclosure of SDG information by local governments and some sociodemographic factors. Specifically, this is the case for the size of a municipality (measured by its population) and the percentage of dependent population. However, other factors, such as population density, foreign population and unemployment rate, have no impact on SDG reporting.
- The analysis conducted in the first paper is complemented by a regional perspective, identifying the regions that are most committed to disclosing information on the SDGs. Thus, according to their level of SDG disclosure, Spanish regions can be grouped into three clusters suggesting a relationship between the geographic localization of regions and their level of commitment to the SDGs. The Spanish regions most committed to the SDGs are in the north-eastern quadrant of the Iberian Peninsula, in the so-called Ebro Valley, whereas the lagging regions (Ceuta and Melilla) are located in the North Africa.

The second article focuses on the influence of the gender of elected officials in municipalities on the level of disclosure of information about initiatives developed to fulfill the 2030 Agenda. Specifically, the influence of the gender of the mayor and the gender diversity of the city council plenary on the disclosure of SDG-related information

by Spanish municipalities is analyzed using the Tobit regression technique on panel data, obtaining the following results:

- There is a balanced gender representation in the municipal plenary, with an average of 45.64% women councillors, reflecting the positive effect of the legal obligation to have a balanced representation of women and men on electoral lists. Conversely, only 27.5% of municipalities have a female mayor, suggesting that women tend to occupy secondary positions on electoral lists and that quota laws are not sufficiently effective in promoting women's empowerment in the composition of municipal government.
- The results show that the rate of disclosure on the SDGs in Spanish municipalities is still low, with an average disclosure of 22 items out of the 60 considered.
- The gender of the mayor affects municipal transparency in relation to the 2030 Agenda, as the disclosure of SDG information is higher in municipalities where a woman holds the position of mayor. Conversely, the gender diversity of the municipal corporation does not affect the disclosure of SDG information. However, a higher presence of women in the municipal plenary has a positive moderating effect on the influence of female mayors on municipal engagement and disclosure of SDG information.
- In terms of the types of sustainability information most commonly disclosed by local governments, the results indicate that those municipalities led by a woman as mayor tend to disclose more information on social and governance issues compared to environmental issues.

In the third article, the influence of the political ideology of the party in power and the degree of political fragmentation in city councils on their disclosure of information on the SDGs is analyzed. As in the previous paper, the analysis is carried out using Tobit regression for panel data, which yielded the following results:

- There is a significant influence of the political ideology of the ruling party, with a higher level of disclosure of SDG information in municipalities governed by left-wing parties.
- The level of political fragmentation in a municipality does not affect the municipality's commitment to the SDGs or the disclosure of information in this regard. Nevertheless, political fragmentation plays a moderating role by limiting the ability of left-wing governments to promote the SDGs as part of their political agenda. Thus, those city councils governed by with left-wing parties and with low political fragmentation show lower levels of SDG disclosure.
- The political ideology of the party that led the regional government has a significant impact on SDG disclosure, but no significant effect of political ideology of the party that led the national government party ideology was found.
- There is a positive effect of the political ideology of the party governing the city council on the disclosure of social information and governance information. On the other hand, political fragmentation only affects the disclosure of social information, which decreases when there is a greater degree of political fragmentation in the city council.

Moreover, at an overall level, the results of the analysis carried out in the three papers that make up this thesis, as well as the complementary analyses carried out in the discussion section, show that the disclosure of SDG information by Spanish local governments is positively influenced by demographic factors, with the largest municipalities and those with a higher percentage of dependent population being those that disclose a greater amount of SDG information. In addition, the annual budget also has a positive effect on SDG disclosure. Finally, the COVID-19 pandemic, which

completely changed the agenda and priorities of public managers, has a positive effect on the disclosure of SDG information.

Thus, with regard to the first research question (RQ1: What is the level of commitment of Spanish local governments to the 2030 Agenda, on which SDGs have they focused their efforts and which ones represent challenges for the future?), it can be concluded that it is low, although it shows an increasing trend over time, especially since 2019, a fact related to the paradigm shift that the COVID-19 pandemic represented in the actions to be prioritized by local governments to protect the safety of citizens and in the disclosure of information through their digital channels. Spanish local governments have focused on SDG8 and SDG11, followed by SDG3, SDG4 and SDG13-15, and conversely, SDG5, SDG6 and SDG17 were identified as the least prioritized SDGs. Furthermore, the COVID-19 pandemic also marked a turning point in this regard, with greater importance being given to those SDGs that are more related to people and prosperity.

With regard to the second research question (RQ2: What is the level of disclosure of information on the 2030 Agenda and the SDGs by Spanish local governments and how has it evolved over time?), it can be concluded that the level of disclosure of information on the SDGs in Spanish municipalities is still low, with an average disclosure of less than half of the 60 municipalities considered, although it shows a growing evolution over time. Finally, with regard to the third research question (RQ3: What socioeconomic, political and demographic factors influence and how do they influence the disclosure of information on the SDGs by Spanish municipalities?), it can be concluded that the information disclosed by Spanish municipalities in the period 2016-2021 is influenced by several socio-demographic, political and geographical factors. Thus, the level of SDG disclosure is positively influenced by the gender of the mayor, since the disclosure of SDG information is higher in municipalities where a woman holds the position of mayor, and this influence is greater in the case of social and governance information. The political ideology of the governing party also affects the disclosure of SDG information, as the disclosure of SDG information is higher in municipalities governed by left-wing parties, and again this influence is greater in the case of social and governance information. Some socio-economic and demographic factors also have a positive impact on SDG information disclosure. This is the case for the size of municipalities, the share of dependent population, and the annual budget of the municipality. Conversely, other factors, such as the gender diversity of the municipal council and the level of political fragmentation in the municipality, do not have a significant impact on the disclosure of information on the SDGs, but interestingly, they play a moderating role by enhancing or limiting the influence of other related factors on the engagement of municipalities and the disclosure of information on the SDGs.

Overall, it can be concluded that despite the positive developments experienced, there is still a long way to go in terms of the 2030 Agenda and the disclosure of information on the SDGs. This is a complex phenomenon, influenced by a variety of factors that not only individually influence the level of SDG disclosure, but also interact with each other to alter their impact on the disclosure of information on the SDGs. We also found that the influence of these factors varies depending on the dimension of sustainability (environmental, social, or governance) to which the SDGs relate.

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ARTICLE 1. 'LOCALIZING' THE SUSTAINABLE DEVELOPMENT GOALS: A MULTIVARIATE ANALYSIS OF SPANISH REGIONS

a.- **Complete reference:** Rieiro-García, M., Amor-Esteban, V., & Aibar-Guzmán, C. (2023). 'Localizing' the sustainable development goals: A multivariate analysis of Spanish regions. *AIMS Environmental Science*, 10(3). Publisher: American Institute of Mathematical Sciences. ISSN: 2372-0352. DOI: 10.3934/environsci.2023021

b.- **Quality indexes:** The journal in which this article is published corresponds to level 4 (quartile Q4 of the ESCI of Web of Science). In this case, this journal is indexed in the ESCI in the category of Environmental Sciences. It has an impact factor of 1.4 in the 2022 ranking (latest available year), and it is placed in the fourth quartile in the category of Environmental Sciences (position 303/330).

This journal is also indexed in Scopus, with CiteScore 2.7 (year 2022, latest available year). In this case, the journal is indexed in the category of Environmental Science – General Environmental Science (position 116/227).

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d.- **Author's contribution:** In this article, the author of the Thesis has participated in the conceptualization of the subject of study, the data extraction, the writing, the project administration, and the incorporation of the changes suggested in the review process. The author of the Thesis contributed significantly to sections 1, 2, 3, 5 and 6 of this article.

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f.- **Names and affiliations of all the co-authors:** The first author (Manuel Rieiro García) is a PhD. student in Economics and Business at the University of Santiago de Compostela. The co-author Victor Amor Esteban is a Professor at the University of Salamanca; and the co-author Cristina Aibar Guzmán is a Professor at the University of Santiago de Compostela.



Research article

‘Localizing’ the sustainable development goals: A multivariate analysis of Spanish regions

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Abstract: Based on the content analysis of the websites of 102 Spanish municipalities related to actions aligned with the 2030 Agenda and the Sustainable Development Goals (SDGs), the X-STATIS technique was applied to analyze the status and dynamic evolution of commitment to the SDGs in regional and local governments over the period of 2016–2021. The results show a low but increasing level of SDG commitment, which also varies significantly across municipalities and regions, as well as by SDGs, which can be attributed to the influence of several sociodemographic factors, such as the number of inhabitants, dependent population and population density. SDG8 and SDG11 stand out as the main priorities of the municipalities, while initiatives related to SDG5, SDG6 and SDG 17 are the least prioritized. The COVID-19 pandemic has marked a turning point in this regard, with greater importance being given to the SDGs more related to people and prosperity. Our findings help citizens and public authorities to understand sustainable regions and municipalities, assess their performance in relation to different dimensions of sustainability and identify key challenges for future improvements. Specifically, the results suggest that public policies should promote actions related to gender equality, drinking water and sanitation and partnerships, as well as favor investment in the regions and municipalities that are lagging behind, in order to improve their level of commitment to the 2030 Agenda and reduce inequalities. From an academic point of view, our results open a door for

the analysis of possible trajectories in the implementation of the SDGs at regional and local levels and the study of their determinants.

Keywords: Agenda 2030; Sustainable Development Goals; local governments; regional governments; X-STATIS

1. Introduction

In order to achieve the total sustainability of the planet, the prosperity of the population and the eradication of poverty, the United Nations (UN) approved in 2015 the 2030 Agenda for Sustainable Development, which is a global agenda that includes a comprehensive set of 17 challenging and interdependent objectives called Sustainable Development Goals (SDGs), representing the various dimensions and elements of sustainability [1], which member countries will have to meet by 2030 [2]. Under the slogan ‘leave no one behind’, this ambitious global agenda requires the collaboration of private companies, citizens, civil organizations, international organizations and governments [3].

‘Localization of global sustainability goals’ is key in addressing sustainability challenges [4]. In this sense, SDG localization refers to “the process of defining, implementing, and monitoring strategies at the local level for achieving global, national, and subnational sustainable development goals. This involves concrete mechanisms, tools, innovations, platforms, and processes to effectively translate the development agenda into results at the local level” [5]. This is not a new concept, as various initiatives to promote sustainability on a local scale have been undertaken over the last three decades, and it was emphasized as a basic need in the mid-term review of the Millennium Development Goals [6].

The achievement of a significant percentage of the targets set for each SDG (up to 65%) requires the involvement of local governments [7]. In this sense, the leading role of regional and local governments (i.e., subnational entities) in the implementation and achievement of the SDGs is recognized in the 2030 Agenda [8,9], highlighting the importance of multi-level collaboration among governments [1] to integrate the SDGs into public policies and budgets [10]. Furthermore, governments must need to disclose information to their different stakeholders on actions related to the SDGs that are being carried out and the results achieved [11].

Achieving the SDGs requires knowing how and to what extent local governments have committed to the 2030 Agenda by implementing actions to address these challenges [1]. However, several years after this global agenda was adopted, there is still limited knowledge about the degree of implementation of the SDGs by local governments and the initiatives developed in this regard [9]. In this vein, successful implementation of the SDGs at the local level requires research to fill the knowledge gap related to how the SDGs have been integrated into local strategies and policies [12]. In addition, to promote sustainability, it is necessary to analyze the interaction between local and regional actors [13]. This paper aims to fill this gap in literature. Thus, the objective of this paper was to analyze the status and dynamic evolution of SDG commitment in Spanish regional and local governments over the period of 2016–2021. The aim was to identify which actions related to the implementation of the SDGs are most important for municipalities and, conversely, which actions represent the main challenge to their future commitment, as well as to analyze the extent to which the commitment of local governments has varied over time. The focus on Spain is justified because of the

high level of commitment acquired in relation to the 2030 Agenda to disclose this information, as is the case in other European countries that apply the Freedom of Information Act [14].

From the content analysis of the websites of 102 Spanish municipalities for the period of 2016–2021, and considering 60 information items related to actions aligned with the 2030 Agenda and the SDGs that can be implemented at the local level (balanced panel of 612 observations), the X-STATIS technique was applied to perform a multivariate analysis that includes two levels of analysis: (1) analysis by SDGs to determine on which SDGs local entities have focused their efforts and which ones have been addressed to a lesser extent throughout the study period, and (2) analysis by regions and entities to determine the extent to which these actions are linked to the contextual characteristics of the municipalities and the demands they make in the context of the 2030 Agenda.

The results show a poor commitment of the Spanish municipalities to the SDGs (37.2% on average), although there has been a notable increase over the period analyzed. We also observed differences in the priorities of the municipalities in terms of their emphasis on the different SDGs and their evolution over time. SDG8 and SDG11 stand out as the main priorities where municipalities' commitment has increased the most, while initiatives related to SDG5, SDG6 and SDG17 have lost momentum. The COVID-19 pandemic has marked a turning point in this regard, with greater importance being given to the SDGs that are more related to people and prosperity.

The call for city rankings and benchmarking studies on sustainability issues has increased in recent decades as a key tool to help citizens and public authorities to understand the level of sustainability of regions and municipalities, assess their performance in relation to different dimensions of sustainability and identify key challenges for future improvements [15]. Given that, depending on its specificities, each territory (municipality or region) has its own sustainability agenda according to its specificities [16]; this type of ranking favors the benchmarking and evaluation of sustainability performance, as well as of the public policies developed by the different regions and municipalities [17,18]. From this perspective, this paper contributes to the existing literature on the implementation of the 2030 Agenda in the public sector, especially in municipalities, by providing an overview of the status and dynamic evolution of the SDG commitment of Spanish regional and local governments over the period of 2016–2021. Our findings reflect the commitment of the largest Spanish local governments to SDG implementation and outline possible sociodemographic factors that may influence their implementation. This analysis is particularly useful in the case of the 2030 Agenda, because the complexity and diversity of the SDGs make it difficult to conduct a homogeneous analysis of the initiatives carried out by municipalities and regions mandated to achieve them [19].

The rest of the paper is structured as follows. Section 2 presents the theoretical background. Section 3 is devoted to explaining the characteristics of the study (population and sample, methodology, and variables). Section 4 presents the results, which are discussed in Section 5. Finally, Section 6 summarizes the main conclusions and implications of the results, as well as the limitations and further extensions of the study.

2. Theoretical background

2.1. The United Nations' 2030 Agenda and Sustainable Development Goals: The role of local govern-



The SDGs are a set of global goals adopted by the UN member states in 2015, as part of the 2030 Agenda to achieve a more sustainable future for the world. They consist of 17 goals and 169 targets, covering a wide range of issues, including hunger and poverty eradication, education, inequalities, gender, sustainable energy and climate action, and are built around five pillars, defined as the 5 Ps: People, Planet, Prosperity, Peace and Partnership [20]. These 17 global goals are as follows:

- SDG1: ‘No poverty’
- SDG2: ‘Zero hunger’
- SDG3: ‘Good health and well-being’
- SDG4: ‘Quality education’
- SDG5: ‘Gender equality’
- SDG6: ‘Clean water and sanitation’
- SDG7: ‘Affordable and clean energy’
- SDG8: ‘Decent work and economic growth’
- SDG9: ‘Industry, innovation and infrastructure’
- SDG10: ‘Reduced inequalities’
- SDG11: ‘Sustainable cities and communities’
- SDG12: ‘Responsible consumption and production’
- SDG13: ‘Climate action’
- SDG14: ‘Life below water’
- SDG15: ‘Life on land’
- SDG16: ‘Peace, justice and strong institutions’
- SDG17: ‘Partnership for the goals’

As can be seen, the SDGs constitute a ‘holistic framework’ [2], whose implementation should be bottom-up, based on local governments’ application of the goals and targets in their respective contexts [6]. While some SDGs directly concern local governments, such as SDG6 and SDG9 [19,21], clearly, regional and local governments have a key role in the achievement of many others because, in many countries, the competences for related services (e.g., health, education, social services, public transport, employment and water and waste management) are decentralized and these governments are primarily responsible for them [22,23].

Table 1 lists some examples of initiatives related to the achievement of the SDGs that fall under the competence of regional and local governments.

2.2. Theoretical framework

Several theories have been used in the literature to explain the adoption of sustainability practices and related disclosures by public and private organizations, including stakeholder theory and institutional theory, as well as legitimacy theory [22,24–26]. According to stakeholder theory, organizations must respond to the demands and needs of their main stakeholders [27]. In the case of local governments, their main stakeholders are the citizens to whom they must provide public services, and to whom they must be accountable for their actions [26,28]. From the perspective of institutional theory [29], the pressures from the environment in which an organization operates lead it to adopt certain behaviors and carry out certain practices and actions. In this sense, regions and municipalities differ in terms of their geographical, demographic and economic characteristics, which affect the main challenges they face in implementing public policies related to the 2030 Agenda [8].

Table 1. Examples of regional and local government initiatives in relation to the SDGs.

SDG Pillars	Initiatives
People	<p>To implement policies to promote access to housing, basic services, education and employment for disadvantaged families (SDG1, SDG4, SDG8, SDG10, SDG11).</p> <p>Supporting local farmers and livestock keepers to ensure a sustainable and healthy food supply (SDG2, SDG3).</p> <p>Facilitating access to health services for citizens, promoting healthy living and reducing the risks of cardiovascular and pulmonary diseases (SDG3, SDG10).</p> <p>To promote initiatives to improve citizens' mental health and well-being (SDG3).</p> <p>Policies to prevent and treat narcotic substance abuse and harmful use of alcohol and tobacco (SDG 3).</p> <p>To increase educational resources and facilitate access to quality primary and secondary education for the whole population (SDG4, SDG10).</p> <p>To ensure that educational centers consider the needs of children with disabilities (SDG4, SDG10).</p> <p>To develop and implement plans against gender violence at the local level (SDG5).</p> <p>Policies to promote the employment of young people, women and disabled people (SDG5, SDG8, SDG10).</p> <p>To ensure safe and secure work environments (SDG10).</p> <p>Policies to guarantee access to banking and financial services for all citizens (SDG8).</p> <p>Policies to promote safe, affordable, accessible and sustainable transport systems, and to improve road safety (SDG11).</p>
Planet	<p>To ensure access to safe drinking water for all citizens (SDG3, SDG6, SDG8, SDG11).</p> <p>To ensure access to adequate and equitable sanitation and hygiene services (SDG3, SDG6, SDG8, SDG11).</p> <p>Policies to increase efficiency in water use (SDG6, SDG11).</p> <p>Policies to guarantee universal access to affordable, reliable and modern energy services (SDG7, SDG10, SDG11).</p> <p>To protect the cultural and natural heritage of the municipality (SDG11).</p> <p>To preserve green spaces and protect biodiversity (SDG11, SDG13, SDG15).</p> <p>Policies to improve air quality and municipal waste management (SDG11, SDG13)</p> <p>Policies to encourage recycling by families and organizations (SDG11, SDG12).</p> <p>To promote and support the use of renewable energy sources, such as solar panels, green energy, etc. (SDG11, SDG13).</p>
Prosperity	<p>To promote energy efficiency in small businesses (SDG 7).</p> <p>Support policies for small businesses and entrepreneurs (SDG8).</p> <p>Promote training programs to update workers and acquire new skills (SDG8).</p> <p>Plans to promote social inclusion, especially for vulnerable people (SDG10).</p>
Peace	<p>To develop plans that support compliance with human rights and improve security in cities (SDG10, SDG11, SDG16).</p>
Partnership	<p>To collaborate with public and private sector organizations, both national and international, to carry out research projects, social and environmental actions or investment in infrastructures (SDG17).</p>

Source: own elaboration based on the targets established for each SDG and literature review.

Thus, according to these theoretical frameworks, both sociodemographic factors [26] and cultural factors [8] will influence the implementation of initiatives related to the achievement of the SDGs by regional and local governments, as well as the disclosure of information related to these initiatives and

their outcomes to citizens and other stakeholders. The sociodemographic factors include the presence of certain population groups (e.g., dependent population, foreign population, elderly and unemployed), as well as the population density and geographical extension of the municipality, while the cultural factors refer to the sensitivity of citizens and other stakeholders to social and environmental issues. Moreover, the more inhabitants of a municipality, the greater the number and diversity of stakeholders it has to serve [30].

In addition to sociodemographic and cultural factors, the availability of resources (financial, technological and human) and the budgetary capacity of the municipality also determine its capability to implement policies related to the SDGs and to disclose information about them [8,24]. Thus, in the Spanish context, previous studies [24,30,31,32] have shown the influence of different sociodemographic and financial variables that influence positively the disclosure of social and environmental information by municipalities. Also, in the Norwegian context, Bardal et al. (2021) [8] have shown the influence of resource availability (financial, technological and human) and the cultural context on the implementation of the SDGs by Norwegian regional and local governments.

3. Research design

3.1. Population and sample

Spain is a parliamentary monarchy organized in a multilevel system of government based on the principle of competence, which consists of three levels: the State, the Regions (17 autonomous communities and two autonomous cities) and the Municipalities (8,129 in total), each of which has financial and political autonomy to manage its responsibilities [19,31]. Figure 1 shows the geographical distribution of the Spanish territory and the extension of the different regions.



Figure 1. Regions of Spain (Source: <https://imagenestotales.com/mapa-de-espana/>).



Table 2 shows some sociodemographic and financial data of the sampled municipalities.

Table 2. Sociodemographical and financial characteristics of Spanish large municipalities (2021).

Region	Municipality	Population(n)	Population Density (hab./km ²)	Dependent Population (%)	Region	Municipality	Population (n)	Population Density (hab./km ²)	Dependent Population (%)	
Andalucía (21)	Alcalá de Guadaira	75,546	265.00	52.00%	Cataluña (16)	Sabadell	216,204	5,761.00	55.00%	
	Algeciras	122,982	1,398.00	52.00%		Sant Boi de Llobregat	83,755	3,804.00	55.00%	
	Almería	200,753	679.00	51.00%		Sant Cugat del Vallès	94,012	1,950.00	53.00%	
	Cádiz	114,244	9288.00	58.00%		Santa Coloma de Gramenet	119,289	16,825.00	56.00%	
	Chiclana de la Frontera	86,306	42.00	47.00%		Tarragona	135,436	2,302.00	53.00%	
	Córdoba	322,071	257.00	54.00%		Terrassa	223,011	3,180.00	53.00%	
	Dos Hermanas	136,250	853.00	49.00%		Ceuta (1)	Ceuta	83,517	4,203.00	50.00%
	El Ejido	84,005	371.00	45.00%		Comunidad Valenciana	Alicante	337,304	1,667.00	53.00%
	Fuengirola	82,585	8,010.00	57.00%		(8)	Castellón de la Plana	172,589	1,550.00	53.00%
	Granada	231,775	2,631.00	57.00%			Elche	234,205	717.00	51.00%
	Huelva	142,538	940.00	53.00%	Gandia		75,970	1,249.00	51.00%	
	Jaén	111,932	264.00	52.00%	Orihuela		78,940	216.00	61.00%	
	Jerez de la Frontera	212,801	179.00	51.00%	Torrent		84,025	1,214.00	51.00%	
	Málaga	577,405	1,459.00	52.00%	Torre Vieja		82,842	1,154.00	60.00%	
	Marbella	147,958	1,263.00	47.00%	Valencia		789,744	5,671.00	54.00%	
	Mijas	86,744	583.00	49.00%	Extremadura		Badajoz	150,610	105.00	51.00%
	El Puerto de Santa María	89,060	560.00	51.00%	(1)	Cáceres	95,418	55.00	50.00%	
	Roquetas de Mar	98,725	1,655.00	42.00%	Galicia (6)	A Coruña	245,468	6,489.00	61.00%	
	San Fernando	94,867	3,172.00	50.00%	Lugo	97,613	296.00	56.00%		
	Seville	684,234	4,819.00	54.00%	Ourense	104,596	1,234.00	63.00%		
	Vélez-Málaga	82,967	524.00	52.00%	Pontevedra	83,114	702.00	55.00%		
Aragon (1)	Zaragoza	675,301	693.00	57.00%	Santiago de Compostela	97,858	445.00	56.00%		
Asturias (3)	Avilés	76,874	2,877.00	59.00%	Vigo	293,837	2,694.00	57.00%		
	Gijón	268,896	1,462.00	62.00%	Islas Balears (1)	Palma	419,366	2,010.00	45.00%	
	Oviedo	217,552	1,166.00	57.00%	La Rioja (1)	Logroño	150,808	1,910.00	57.00%	

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Region	Municipality	Population(n)	Population Density (hab./km ²)	Dependent Population (%)	Region	Municipality	Population (n)	Population Density (hab./km ²)	Dependent Population (%)
Canarias (5)	Arona	82,563	1,012.00	37.00%	Madrid (16)	Alcalá de Henares	195,982	2,234.00	51.00%
	San Cristóbal de La Laguna	158,010	1,542.00	42.00%		Alcobendas	116,589	2,592.00	52.00%
	Las Palmas	378,675	3,665.00	46.00%		Alcorcón	170,817	5,064.00	62.00%
	Santa Cruz de Tenerife	208,563	1,386.00	48.00%		Coslada	81,273	6,767.00	51.00%
	Telde	102,769	1,024.00	41.00%		Fuenlabrada	192,233	4,868.00	43.00%
Cantabria (1)	Santander	172,221	4,773.00	60.00%		Getafe	183,095	2,336.00	56.00%
Castilla y	Burgos	174,051	1,626.00	60.00%		Leganés	187,762	4,357.00	61.00%
Leon (5)	León	122,051	3,127.00	66.00%		Madrid	3,305,408	5,457.00	52.00%
	Palencia	77,090	810.00	60.00%		Móstoles	209,639	4,630.00	56.00%
	Salamanca	143,269	3,622.00	67.00%		Parla	131,689	5,373.00	49.00%
	Valladolid	297,775	1,509.00	65.00%	Pozuelo de Alarcón	87,134	2,017.00	55.00%	
Castilla-La	Albacete	172,722	153.00	50.00%	Rivas-Vaciamadrid	92,925	1,379.00	42.00%	
Mancha (5)	Ciudad Real	75,104	263.00	51.00%	Las Rozas de Madrid	94,862	1,627.00	52.00%	
	Guadalajara	87,064	370.00	52.00%	San Sebastián de los Reyes	90,962	1,551.00	49.00%	
	Talavera de la Reina	83,477	446.00	56.00%	Torrejón de Ardoz	132,771	4,070.00	49.00%	
	Toledo	85,449	368.00	52.00%	Valdemoro	77,587	1,209.00	46.00%	
Cataluña (16)	Badalona	223,006	10,650.00	55.00%	Melilla (1)	Melilla	86,261	6,058.00	53.00%
	Barcelona	1,636,732	16,244.00	52.00%	Murcia (3)	Cartagena	216,365	386.00	54.00%
	Cornellà de Llobregat	89,300	12,961.00	55.00%		Lorca	96,238	57.00	50.00%
	Girona	101,932	2,616.00	49.00%		Murcia	460,349	520.00	50.00%
	L'Hospitalet de Llobregat	264,657	19,460.00	53.00%	Navarra (1)	Pamplona	203,081	8,078.00	58.00%
	Lleida	140,080	661.00	52.00%	País Vasco (5)	Barakaldo	100,907	4,038.00	59.00%
	Manresa	78,192	1,878.00	58.00%		Bilbao	346,405	8,379.00	57.00%
	Mataró	129,120	5790.00	53.00%		San Sebastián	188,102	3,089.00	60.00%
	Reus	106,084	2005.00	56.00%		Getxo	77,139	6,499.00	64.00%
Rubí	78,549	2442.00	50.00%	Vitoria-Gasteiz		253,093	914.00	58.00%	
					Total	102 municipalities	22,221,075	3,007.50	53.38%

Following previous studies [21,23], we used population as a criterion to select the sample under study, considering that large municipalities (i.e., those with more inhabitants) have to meet the needs of a larger number of citizens and have more resources to do so [24]; therefore, it is expected that they will have to deal with more complex economic and social issues than smaller entities, whose activity usually focuses on the provision of the most basic services. Based on the provisions of Law 57/2003, we have selected the 102 Spanish municipalities that meet the criteria to be considered large municipalities, i.e., those with a population of more than 75,000 inhabitants.

Given that both the geographical extension and the population of the different regions into which the Spanish territory is divided are very different, the distribution of the municipalities in the sample among the different regions is very diverse. Andalucía stands out, with 21 large municipalities, followed by Cataluña and Madrid, with 16 municipalities each. On the other hand, there are several regions with only one large municipality (e.g., Aragón, Cantabria, Ceuta, Islas Baleares, La Rioja, Melilla and Navarra).

The analysis period corresponds to six years (2016 to 2021), i.e., from the entry into force of the 2030 Agenda and to the last year for which complete data are available.

3.2. Variables

Based on previous studies [19], we identified 60 information items related to the different actions related to the implementation of the SDGs that may be developed by local entities (see Table 3). Each item is related to a specific SDG, with the exception of SDG9, SDG10, SDG12 and SDG16, which were not considered separately, due to their broad scope and to avoid duplication, as some of their targets are included in other SDGs to which they are related (e.g., SDG 11 and SDG 17). In addition, SDG13, SDG14 and SDG15 have been grouped together because of their relationship, and to favor the analysis of the Spanish territory on a homogeneous and comparable basis given the geographical diversity that characterizes the Spanish territory (coastal and inland regions) and the different challenges that arise in each case.

We carried out a content analysis of the different websites of the sampled entities using the following criterion: for each item and year with information present on the entities' website, a value of 1 was assigned, and 0 otherwise. This data collection technique allows the analysis of qualitative information through a quantitative analysis [33], and it has already been used in previous studies on local government transparency [34,35,36,37,38]. As a result, panel data of 612 observations were obtained.

Subsequently, the 60 information items were grouped into their corresponding SDGs, giving rise to 11 new quantitative variables, corresponding to SDG1, SDG2, SDG3, SDG4, SDG5, SDG6, SDG7, SDG8, SDG11, SDG13–15 and SDG17.

Table 3. Information items related to the SDGs.

Item	Description	SDG
1	The city council announces lunch scholarships for children from families at risk of social exclusion.	SDG 1
2	The local authority collects food and clothing for people at risk of social exclusion.	SDG 1
3	The AROPE index results are published for the municipality.	SDG 1
4	The municipality reports updated year-end statistics on underage obese population.	SDG 2
5	There are workshops, lectures and trainings with experts about nutrition and sustainable eating.	SDG 2
6	The local authority distributes grants and subsidies for agricultural entrepreneurs.	SDG 2
7	The rate of underweight babies born in the city is published.	SDG 2
8	The ratio of agricultural employed population compared to other sectors of the municipality is published.	SDG 2
9	The proportion of land used for agricultural purposes in the municipality is disclosed.	SDG 2
10	There are promotional campaigns to encourage the consumption of km 0 and local products.	SDG 2
11	There are campaigns to increase the awareness of childhood obesity.	SDG 2
12	There are sport activities organized for the community.	SDG 3
13	There are emotional and psychological health activities.	SDG 3
14	There are activities for the reduction of adolescent digital dependence.	SDG 3
15	The municipality develops actions and awareness-raising initiatives in order to prevent/reduce the consumption of drugs and alcohol among the population.	SDG 3
16	The number of deaths in the city is published.	SDG 3
17	The number of fatalities caused by NTDs (e.g., cardiovascular or brain diseases) is disclosed.	SDG 3
18	The number of fatalities due to suicide in the city is published.	SDG 3
19	The municipality provides data about life expectancy at birth.	SDG 3
20	The municipality reports the child mortality rate (1 years old and under).	SDG 3
21	The local council holds sexuality talks, seminars, workshops and awareness-raising activities to prevent the risk of transmission of HIV and AIDS.	SDG 3
22	The council offers digital skills training programs for residents.	SDG 4
23	The municipality offers foreign language training.	SDG 4
24	The municipality provides training courses, talks and workshops for active aging.	SDG 4
25	The municipality reports the degree of meeting the needs of the elderly (ratio of residential and day care places available/persons over 64 years of age).	SDG 4
26	The municipality publishes the rate of illiterate people in the city.	SDG 4
27	The municipality publishes statistics on the usage of municipal libraries.	SDG 4
28	The municipality organizes promotional campaigns to enhance the use of municipal libraries.	SDG 4
29	The municipality has a gender equality plan published for its staff.	SDG 5
30	The municipality has a gender equality plan published for the population.	SDG 5
31	There are annual activities conducted about gender equality. Minimum 10 activities in the last year to fulfill the indicator.	SDG 5
32	Gender-based violence denunciations are published by the municipality.	SDG 5
33	The municipality publishes the rate of protection orders adopted for gender violence victims.	SDG 5
34	The municipality publishes a report on water management that includes information on savings, consumption, liters recycled, etc.	SDG 6
35	The local government publishes annually the water management plan.	SDG 6

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Item	Description	SDG
36	The municipality publishes yearly data about water quality deficiencies caused by non-justified reasons.	SDG 6
37	The city council organizes activities to raise public awareness of responsible water use.	SDG 6
38	The municipality researches the detection of diseases and viruses in the municipality's wastewater.	SDG 6
39	There is an energy efficiency plan in place in the city.	SDG 7
40	The municipality makes public the energy sources used in municipal buildings and street lighting.	SDG 7
41	The municipality administers grants and subsidies for energy transition in communities, homes and businesses.	SDG 7
42	There are seminars, training courses and conferences on energy efficiency and household energy-savings.	SDG 7
43	There are talks and seminars for the population transition to renewable energies.	SDG 7
44	The municipal energy production (including CHP plants, PV installations for self-consumption, etc.) is disclosed.	SDG 7
45	The council administers the grant applications for new business start-ups.	SDG 8
46	In the first years of the business' life, the municipality assists the entrepreneurs with the formalities and management.	SDG 8
47	Annually, the municipality organizes a minimum of five training activities for the employment of people aged 50 and over.	SDG 8
48	Annually, the municipality organizes a minimum of five lectures and training programs for people under 30 years old.	SDG 8
49	The municipality organizes workshops and programs for unemployed people and entrepreneurs.	SDG 8
50	The noise level of the city is published.	SDG 11
51	The council promotes the usage of a more sustainable transport (on foot, by taxi, by electric scooter, by bike, by bus...).	SDG 11
52	The municipality maintains an updated fire prevention plan.	SDG 13–15
53	Different activities are organized to increase awareness about the importance of protecting nature and recycling.	SDG 13–15
54	Eco-friendly activities are performed (e.g., planting a tree).	SDG 13–15
55	The annual waste generation average per inhabitant is reported.	SDG 13–15
56	Household recycling initiatives are promoted through campaigns.	SDG 13–15
57	The local authority produces and disseminates an annual CSR report.	SDG 17
58	The municipality makes public the funding details and amounts reimbursed (including at least the funding source and the lender).	SDG 17
59	The municipality issues a detailed overview of supplier and creditor payments and outstanding invoices.	SDG 17
60	The municipality makes GDP per capita data public.	SDG 17

3.3. Method

The X-STATIS technique was used to reflect the multidimensional nature of our data. A similar approach has been used in previous studies related to both sustainability [19,39,40,41,42,43,44] and other fields, such as maritime safety [45] and Worldwide Governance Indicators [46]. This method, which belongs to the STATIS family [47,48] is used to analyze data with three-dimensional format

structures, as in our case. Thus, the first dimension corresponds to the regions where the municipalities are located, the second dimension refers to the actions related to the implementation of the SDGs by the municipalities and the third dimension refers to the study period (2016–2021).

Applying the X-STATIS technique, our data form a table of $(19 \times 11) \times 6$ years: 19 regions (17 autonomous communities + 2 autonomous cities), 11 variables (the SDGs to which the information items refer) and the 6 years under study. The X-STATIS technique implies three levels of analysis: (i) inter-structure analysis, (ii) compromise (disclosure) analysis and (iii) infrastructure analysis, which was carried out by using the ADE-4 software [49].

Figure 2 depicts graphically the construction flow of the X-STATIS analyses.

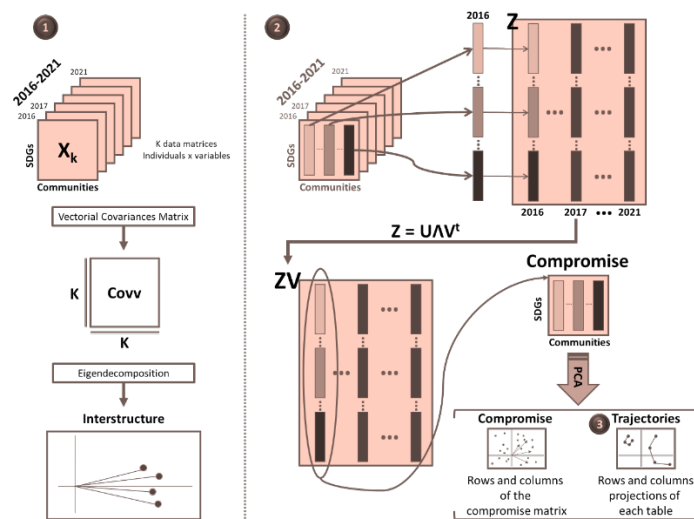


Figure 2. X-STATIS analysis construction flow (Source: adapted from [39], p. 9)).

4. Results

4.1. Descriptive analysis

Table 4 shows the descriptive statistics. As can be seen, during the 6-year period studied, the level of commitment of municipalities to disclose information on the SDGs has been, on average, low, with a disclosure rate of 37.2%. However, disclosure on the SDGs has increased throughout the study period from 34.4% in 2016 to 43.1% in 2021.

This increase has also led to differences in the priorities of the municipalities. Thus, SDG8 and SDG11 are the top priorities of the municipalities, increasing the disclosure of information related to them by 35.7% and 27.9%, respectively, over the period; followed by SDG3, SDG4 and SDG13–15, with increases between 15% and 17%. These SDGs were also prioritized by municipalities in the last year studied (2021), with all of them showing a disclosure level above 40% (43.1%). Thus, SDG8 is disclosed by 92.9% of the municipalities, SDG11 by 61.8% of municipalities, SDG4 by 54.8% of municipalities, SDG13–15 by 51.4% of municipalities and SDG3 by 42.1% of municipalities.

In addition, the level of commitment to SDG1, SDG2 and SDG7 remained unchanged during the period, without significant variations. These SDGs are still not considered a priority by the municipalities, which report information on them in the range of 31–35% in 2021. On the other hand, SDG5, SDG6 and SDG17 experienced a decrease in their disclosure level, between 5–8%, presenting

in 2021 a disclosure level of 31.2% (SDG 6) and 26.7% (SDG 5). SDG17 is the least prioritized goal by municipalities, with a disclosure level of 11.5% in 2021 and a decrease in disclosure of 9% over the study period.

Table 4. Descriptive analysis by SDG and year.

SDG	2016		2017		2018		2019		2020		2021		21–16 Dif.	2016–2021	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		Mean	SD
SDG 1	33.3%	29.7%	36.9%	28.5%	33.7%	28.3%	37.6%	27.6%	32.4%	24.6%	35.3%	22.4%	2.0%	34.9%	26.9%
SDG 2	30.9%	17.7%	29.5%	18.5%	30.9%	18.1%	32.5%	18.0%	26.0%	13.8%	31.0%	13.1%	0.1%	30.1%	16.7%
SDG 3	26.8%	18.2%	25.9%	18.5%	26.9%	18.8%	28.0%	19.6%	41.2%	17.6%	42.1%	15.9%	15.3%	31.8%	19.4%
SDG 4	37.7%	18.8%	39.5%	18.6%	42.4%	16.1%	40.3%	19.4%	42.7%	16.1%	54.8%	14.2%	17.1%	42.9%	18.1%
SDG 5	32.2%	19.7%	35.5%	21.0%	33.1%	22.4%	33.7%	23.4%	21.6%	20.8%	26.7%	21.1%	-5.5%	30.5%	21.9%
SDG 6	36.9%	22.1%	39.8%	23.6%	40.2%	24.5%	39.0%	24.8%	28.0%	22.0%	31.2%	24.1%	-5.7%	35.8%	23.9%
SDG 7	34.5%	21.1%	40.7%	21.8%	39.5%	21.5%	34.6%	25.2%	33.0%	26.9%	35.3%	26.1%	0.8%	36.3%	24.0%
SDG 8	57.3%	25.6%	56.9%	28.7%	54.7%	28.6%	57.8%	26.4%	75.9%	29.3%	92.9%	16.6%	35.7%	65.9%	29.6%
SDG 11	33.8%	29.1%	38.2%	30.0%	36.8%	28.9%	41.2%	27.6%	52.5%	27.6%	61.8%	32.4%	27.9%	44.0%	30.8%
SDG 13–15	35.3%	20.5%	37.6%	20.9%	37.5%	20.4%	36.7%	21.8%	47.5%	23.5%	51.4%	20.6%	16.1%	41.0%	22.1%
SDG 17	20.3%	22.5%	19.9%	21.5%	16.7%	21.2%	16.2%	21.3%	12.0%	18.9%	11.5%	16.4%	-8.8%	16.1%	20.6%
Total	34.4%	10.3%	36.4%	9.4%	35.7%	10.7%	36.2%	10.5%	37.5%	11.7%	43.1%	11.4%	8.6%	37.2%	11.0%

Table 5. Descriptive analysis by region and year.

Region	2016		2017		2018		2019		2020		2021		21–16 Dif.	2016–2021	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		Mean	SD
Andalucía	31.6%	5.8%	36.2%	4.5%	34.3%	6.4%	36.5%	4.9%	38.7%	4.4%	42.4%	4.5%	11%	36.6%	6.1%
Aragón	32.6%		39.1%		46.0%		43.2%		34.6%		55.3%		23%	41.8%	8.3%
Asturias	43.1%	2.3%	42.9%	2.9%	39.0%	6.7%	38.4%	4.9%	36.1%	6.3%	47.7%	6.8%	5%	41.2%	5.9%
Canarias	35.2%	6.9%	32.8%	4.6%	32.9%	6.7%	33.2%	4.5%	37.4%	4.8%	41.2%	2.5%	6%	35.5%	5.7%
Cantabria	50.3%		48.8%		45.8%		52.8%		57.5%		65.3%		15%	53.4%	7.0%
Castilla y León	32.6%	4.7%	38.4%	7.7%	32.0%	6.9%	37.2%	10.0%	33.3%	6.9%	48.1%	9.4%	16%	36.9%	9.1%
Castilla-La Mancha	35.2%	4.7%	38.8%	5.9%	39.1%	7.6%	35.7%	4.3%	36.5%	7.1%	43.6%	6.3%	8%	38.1%	6.3%
Cataluña	39.9%	8.4%	38.1%	7.4%	38.2%	8.7%	36.7%	11.0%	40.0%	10.6%	43.0%	9.4%	3%	39.3%	9.3%
Ceuta	34.3%		29.9%		23.5%		26.3%		13.6%		19.7%		-15%	24.5%	7.4%
Comunidad Valenciana	39.1%	16.8%	44.0%	8.7%	40.3%	15.2%	40.9%	14.4%	48.1%	8.2%	54.0%	11.3%	15%	44.4%	13.2%
Extremadura	38.0%	9.8%	28.9%	2.7%	34.8%	5.0%	33.3%	1.4%	37.9%	0.4%	40.5%	0.4%	3%	35.5%	5.2%
Galicia	31.3%	19.0%	35.8%	20.3%	34.1%	20.0%	38.6%	22.3%	37.3%	23.3%	40.0%	19.6%	9%	36.2%	19.5%
Islas Baleares	27.4%		45.2%		38.8%		30.8%		37.6%		41.3%		14%	36.8%	6.6%
La Rioja	30.5%		31.5%		38.4%		26.4%		51.2%		54.9%		24%	38.8%	11.7%
Madrid	26.3%	7.6%	27.1%	6.3%	28.9%	10.1%	29.8%	11.0%	25.6%	10.4%	33.0%	10.8%	7%	28.5%	9.6%
Melilla	23.4%		20.8%		14.6%		19.1%		13.3%		16.2%		-7%	17.9%	3.9%
Murcia	30.7%	3.0%	33.2%	7.6%	40.5%	10.7%	38.0%	3.7%	49.3%	2.7%	53.0%	2.7%	22%	40.8%	9.7%
Navarra	47.0%		40.6%		28.3%		38.8%		48.5%		52.2%		5%	42.6%	8.6%
País Vasco	46.6%	8.2%	49.9%	6.9%	50.5%	5.0%	46.8%	5.9%	46.0%	9.6%	52.7%	9.6%	6%	48.8%	7.5%
Total	34.4%	10.3%	36.4%	9.4%	35.7%	10.7%	36.2%	10.5%	37.5%	11.7%	43.1%	11.4%	8.6%	37.2%	11.0%

Table 5 shows the descriptive statistics of the level of SDG disclosure for each autonomous community and the two autonomous cities. As can be seen, on average, all regions have increased their level of disclosure over the period of 2016–2021, with the exception of the autonomous cities of Ceuta and Melilla, where a decrease in the disclosure level of 14.6% and 7.2%, respectively, is observed, placing them at the lower pole with respect to the rest of the regions, with a disclosure level of less than 20% in 2021.

Regarding 2021, Cantabria is the region most committed to the 2030 Agenda, with the highest level of disclosure (65.3%), followed by Aragon (55.3%), La Rioja (54.9%), País Vasco (52.7%) and Navarra (52.2%), with Murcia and Comunidad Valenciana at similar levels (53–54%). In addition, these regions increased their disclosure levels by 15–24% during the period of study. The other regions (Castilla y León, Asturias, Castilla-La Mancha, Cataluña, Andalucía, Islas Baleares, Canarias, Extremadura and Galicia) show disclosure rates between 40–48% in 2021. At the opposite pole, Madrid shows a low disclosure rate (33%), and Ceuta and Melilla are below 20%.

4.2. Analysis by SDGs

As indicated above, the X-STATIS technique involves three levels of analysis. In regard to the inter-structure analysis, the similarities and differences between the years were analyzed through the vector correlation coefficient between matrices (Table 6).

Table 6. Vector correlations.

	2016	2017	2018	2019	2020	2021
2016	1000					
2017	698	1000				
2018	544	609	1000			
2019	477	533	550	1000		
2020	327	425	384	412	1000	
2021	305	419	382	389	832	1000

In Figure 3, this information is plotted on a factorial plane, representing 76% of the information on the first two axes, by graphing the vector correlation analysis. The data show acute angles between the vectors, which implies that there are strong inter-annual relationships, which occur progressively. The largest difference between the years 2016 and 2021 stands out due to the growth mentioned above. Moreover, we can observe a turning point in 2019, which allows us to distinguish two distinct phases within the period: 2016–2019 and 2020–2021.

In order to deepen into the analysis of the years, in Figure 4 we show in two-dimensional form the disclosure level by SDG (vertical lines) and by year (horizontal lines) through a parallel coordinate graph. As can be seen, in the second phase (2020 and 2021), the priority SDGs are SDG8, SDG11, SDG4, SDG13–15 and SDG3, with a significant difference compared to the previous phase (2016–2019). In the remaining SDGs, the years are interspersed. As mentioned above, SDG17 is the most neglected by municipalities, with the lowest level of disclosure in 2021 (12%).



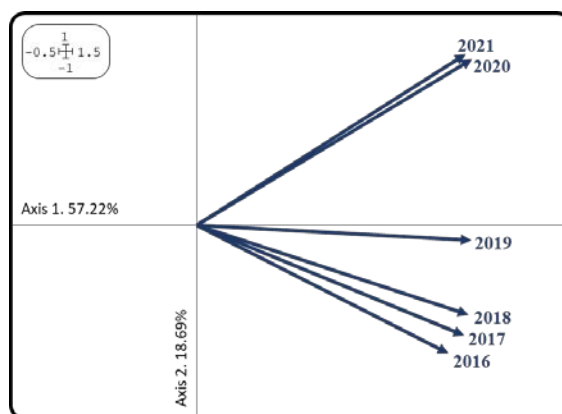


Figure 3. Inter-structure analysis.

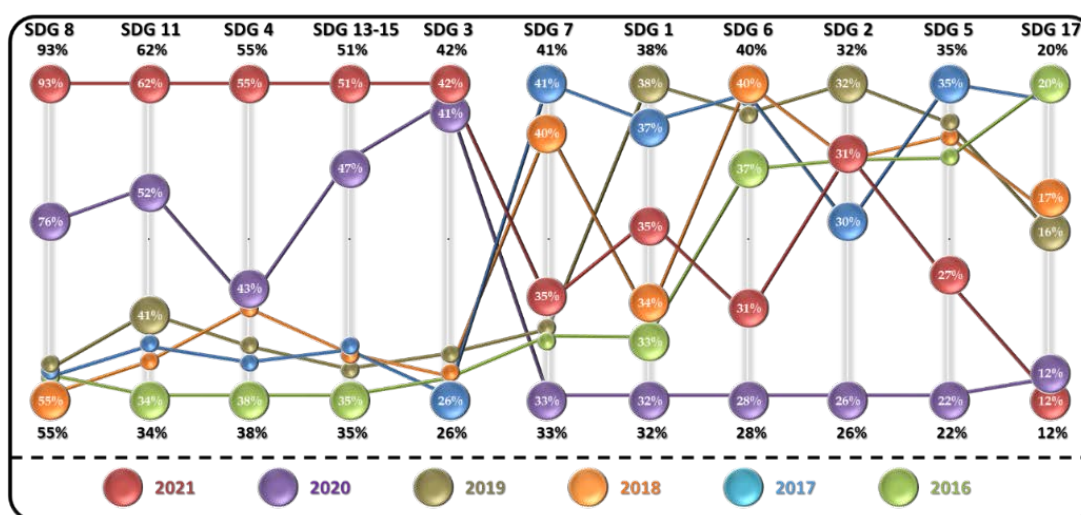


Figure 4. Analysis of parallel coordinates: SDG disclosure by year.

4.3. Analysis by region

Figure 5 shows the orientation toward the SDGs of each region through the commitment (disclosure) subspace. The 1–2 factorial plane contains 57% of the information, making it possible to observe individually how each region is positioned on the plane, so that each point summarizes its global disclosure level during the study period according to its preferences for the SDGs. This representation allows us to characterize the regions, identifying their priorities in relation to the SDGs and the challenges to be faced until 2030.

Looking at the direction of the vectors in Figure 5, we can see that most of the regions are on the right half-plane. Cantabria and País Vasco (located on the right of the map) stand out as the regions with the highest commitment to the SDGs, with greater emphasis on SDG3, SDG11, SDG4 and SDG5. Aragon has a similar profile, but with a lower level of commitment. In the lower part of the map, we find the rest of the SDGs, with Navarra and La Rioja being the regions with the greatest commitment to them, standing out in SDG7, SDG6, SDG13–15 and SDG2. Other regions, such as Murcia and the Comunidad Valenciana, also have this profile, with a lower commitment level. The rest of the regions are one or two levels below. Castilla y León and Asturias focus on SDG4 and SDG8, while the Islas

Baleares and Extremadura focus on SDG13–15 and SDG7. Galicia, Islas Canarias and Madrid show the lowest levels of commitment, although they are above Ceuta and Melilla (located on the left of the map), which are the least committed to the 2030 Agenda.

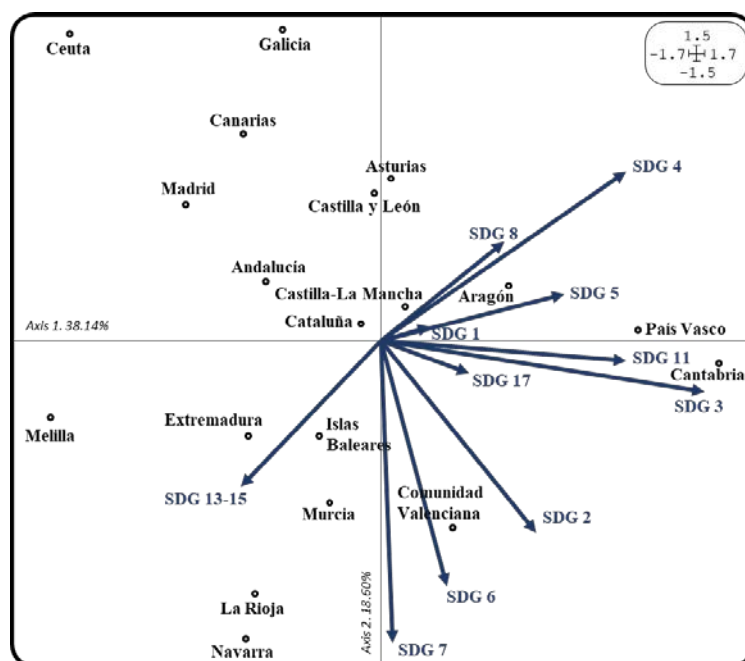


Figure 5. Sub-space of commitment: regions by SDGs (2016–2021).

The third part of the analysis corresponds to the infrastructure analysis (or trajectory analysis) which analyzes the evolution of the regions in each year. The factorial plane is the same as the previous one (Figure 5). Therefore, we know that it collects 57% of the information; the difference is that now we project the position of each region in the different years of the study. Previously, we have observed that all matrices (the years under study) have similar weights in the construction of the commitment (Table 7, column ‘Weights’) and have a correct representation in this subspace (Table 7, column ‘Cos2’).

Table 7. Weights and representation of each matrix in the commitment construction.

Year	Rows	Weights	Cos ²
2016	19	4.01E+02	0.574
2017	19	4.43E+02	0.663
2018	19	4.06E+02	0.600
2019	19	4.08E+02	0.580
2020	19	3.95E+02	0.680
2021	19	3.95E+02	0.663

This information is shown in Figure 6, where it is possible to individually observe each of the 19 regions and their position on the map for each year of the study so that we can evaluate their trajectory in this period. Each point reflects the position of the regions in terms of their preferences for the SDGs

in each year, with the vectors corresponding to each SDG. Thus, in Figure 6, we can observe that many regions show dynamic trajectories, changing their preferences during the years of study.

Thus, Ceuta and Melilla, the lagging regions, show a negative evolution, moving their position to the left side of the map. Other regions, such as Castilla-La-Mancha, Cataluña, Galicia and Madrid, also lag in their position on the map, showing a low level of commitment to the SDGs located in that part of the map. The remaining regions show a stable or positive evolution in their commitment to the 2030 Agenda. Cantabria and País Vasco are the leading regions in the study throughout all the period, and their preferences change slightly, as shown by their vertical trajectories. Aragon shows a positive evolution over the years, which indicates that it is on the right way. La Rioja and Navarra, with a high disclosure level regarding to SDG7, SDG 6, SDG 2 and SDG 13–15, show strong changes in their priorities over the period, mainly in 2019 and 2020. A similar situation, although with a lower commitment, can be observed for Islas Baleares and Extremadura. Finally, we highlight a slight increase in the level of SDG disclosure for Castilla y León and Comunidad Valenciana.

4.4. Analysis by municipalities

Since our original data referred to the 102 largest Spanish municipalities, the X-STATIS analysis was performed on this data, which, in this case, is the 3-way matrix $102 \times 11 \times 6$: 102 municipalities, 11 SDGs and 6 years (2016–2021). For reasons of visualization, for this analysis, we will only represent the commitment subspace, with the information synthesized from the study years in a single image (Figure 7). This representation reflects a total inertia of 53%, which makes it possible to identify which municipalities are the most advanced in the implementation of the 2030 Agenda and, on the contrary, which are the municipalities that are lagging the furthest behind, as well as which SDGs are more/less prioritized.

First, as can be seen in Figure 7, the structure of the variables is practically the same as that found in the previous analyses, which verifies the correlations mentioned above: on the one hand, SDG3, SDG4, SDG5, SDG8 and SDG11 are related (upper half-plane), and, on the other hand, SDG2, SDG6, SDG7, SDG13–15 and SDG17 are related (lower half-plane); however, in the previous analyses, SDG17 was not very discriminating and was located at the origin of the coordinates.

In relation to the 102 municipalities, it is worth noting that the city of Madrid presents one of the strongest commitments to the 2030 Agenda (with a disclosure level of 61% in 2021). This marks an important difference with respect to the analysis carried out previously by regions, in which the region of Madrid (with 16 municipalities in the sample) occupied one of the last positions. In general, we observe that a large majority of the municipalities are located in the middle of the figure, which translates into an unremarkable commitment to the 2030 Agenda.

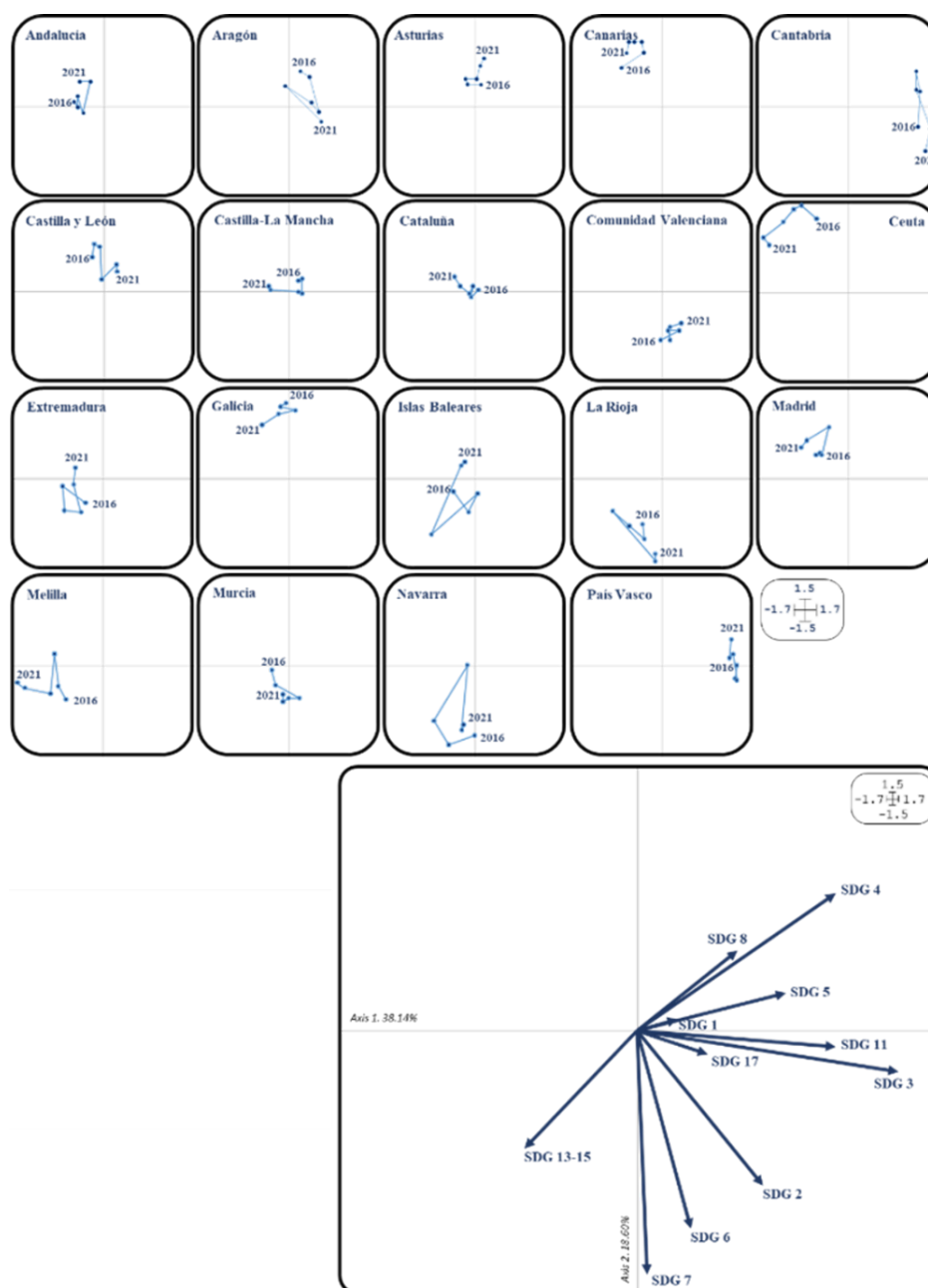


Figure 6. Commitment subspace and intra-structure analysis by region.

The relevant information in this figure corresponds to the municipalities that distance themselves from the rest, which indicates a strong commitment to the 2030 Agenda, varying their priorities according to their proximity to one or another SDG. The most committed municipalities to the 2030 Agenda are located on the right half-plane. This is the case of A Coruña, Valencia, Barcelona, Donostia, Madrid, Santander, Valladolid, Vitoria-Gasteiz and Bilbao, all of which are large cities. These municipalities emphasize SDG3, SDG4, SDG5, SDG8 and SDG11. In second place, and only concerned with these SDGs, we find Getxo, Barakaldo and Las Palmas de Gran Canaria, smaller cities. If we move upward, we find Telde, Lugo, Avilés or Pontevedra, with deficient commitments, as they are only concerned with two or three SDGs, i.e., SDG4 and SDG8.

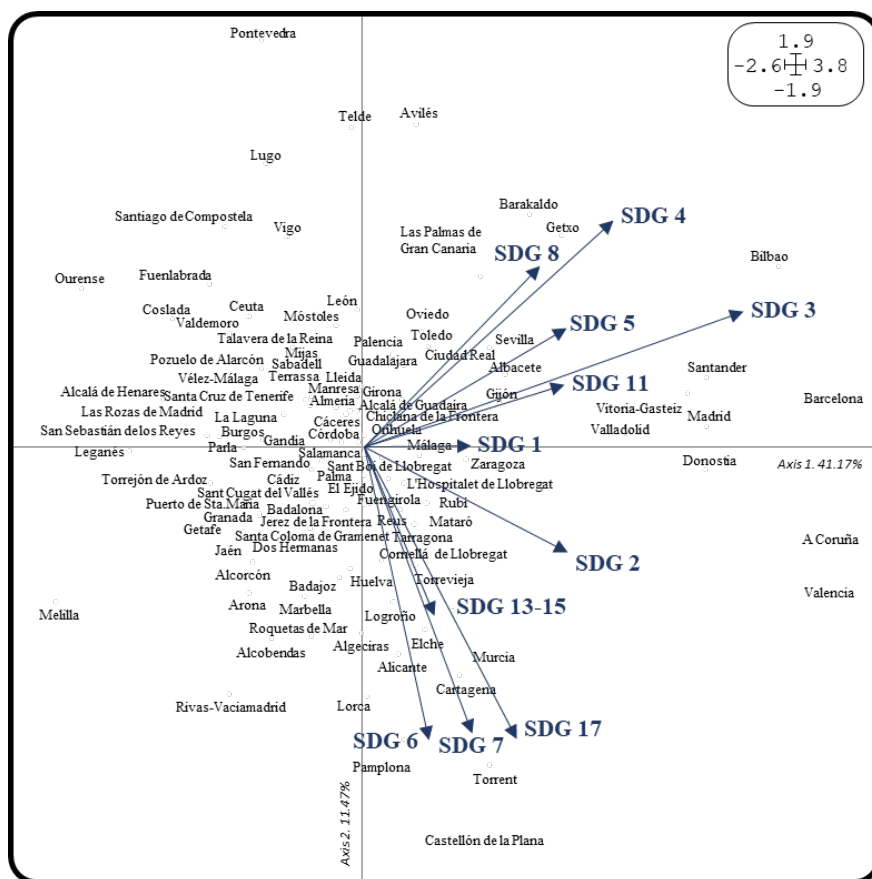


Figure 7. Commitment subspace by municipality.

5. Discussion

From the analysis carried out on the commitment of Spanish regions to the 2030 Agenda, as measured by the disclosure of information on municipal websites on various initiatives developed to achieve the SDGs between 2016 and 2021, it is possible to state that the disclosure rate is quite low, with an average of 37.2%. This rate is much lower than that obtained by Alcaraz-Quiles et al. (2014, 2017) [22,50], who found a disclosure rate of 61.23% in Spanish regions in relation to the information items proposed in the guidelines issued by the Global Reporting Initiative. However, it should be noted that these authors analyzed the disclosure regarding a list of items related to general information, financial information, social information and environmental information, while we only analyzed the disclosure of information related to initiatives directly linked to the achievement of the SDGs. Our result is also slightly lower than the disclosure rate obtained by Navarro et al. [30], who analyzed the disclosure of information on corporate social responsibility on the websites of 55 large Spanish local governments, finding a disclosure rate of 40.42%. More recently, Navarro-Galera et al. [51], in an international comparative analysis including large municipalities from nine European countries, found that the disclosure of sustainability information by the 19 large Spanish municipalities included in their sample was 48%, which is lower than that of municipalities from Anglo-Saxon and Nordic countries.

Nevertheless, it is worth noting that disclosure on the SDGs has increased throughout the study period, from 34.4% in 2016 to 43.1% in 2021. This positive evolution seems to indicate a growing involvement of municipalities in the 2030 Agenda and a greater transparency of information in this

regard. In addition, we can observe a turning point in 2019, which allows us to distinguish two different stages within the study period: 2016–2019 and 2020–2021. This difference can be explained by the paradigm shift brought about by the COVID-19 epidemic in the way governments, especially local governments, deliver public services to citizens and prioritize actions within government agendas [52,53], as well as in the disclosure of information through their digital channels [54,55].

Both the SDG disclosure level and its evolution over the study period vary significantly between municipalities and regions, as well as by SDG. SDG8 and SDG11 stand out as the municipalities' top priorities, increasing the disclosure of information related to them; SDG3 and SDG4 and SDG13–15 also show a high degree of commitment, while, for SDG5, SDG6 and SDG17, there is a low level of disclosure, which also decreased during the period. In this respect, our results differ from those obtained by the Fondazione Eni Enrico Mattei (2020) [56], which, in the case of Italy, documents the best results at the local level for SDG1, SDG6 and SDG17. It seems that Spanish municipalities focus mainly on the SDGs related to the Planet and People pillars of the 2030 Agenda, while, on the contrary, the Partnership pillar (SDG 17) has received less attention, despite the importance of partnerships in solving the problems related to the lack of financial and human resources for the implementation of the SDGs at the local level [57]. On the other hand, from the perspective of the three dimensions of sustainability (i.e., social, environmental and governance), Spanish municipalities seem to give more importance to the social dimension of sustainability, followed by the environmental dimension, while governance comes in last place. This result may be explained by the fact that governance is “a highly contextual concept, in which processes and practices vary significantly depending on the environment in which they are applied,” which, in this case, involves the size and political and financial constraints of the municipalities [58].

In regard to the regions, Cantabria and País Vasco stand out as the Spanish regions most committed to the SDGs, followed by Aragon, La Rioja and Navarra. Conversely, Galicia, Islas Canarias and Madrid show the lowest commitment levels, along with the autonomous cities of Ceuta and Melilla, the lagging regions, which also show a negative evolution. Our ranking of regions according to their commitment to the SDGs differs significantly from that obtained by Alcaraz-Quiles et al. [50] regarding the transparency of sustainability information. Following D'Adamo et al. [16], we have grouped the regions into three clusters according to their level of SDG disclosure. We started from the average mean value (37.2%) and considered that the regions with mean values around this value ($\pm 11\%$, the average standard deviation) form the cluster of SDG medium values, whereas those regions with mean values higher and lower form the cluster of SDG high values and the cluster of SDG low values, respectively. Thus, the cluster of high SDG values is made up of five regions: Cantabria (53.4%), País Vasco (48.8%), Comunidad Valenciana (44.4%), Navarra (42.6%) and Aragón (41.8%); and, the cluster of SDG low values is made up of three regions: Melilla (17.9%), Ceuta (24.5%) and Madrid (28.5%). The remaining regions are included in the cluster of medium SDG values. To a certain extent, our results suggest a relationship between the geographical localization of regions and their level of commitment to the SDGs. As can be seen in Figure 1, the Spanish regions most committed to the SDGs are located in the northeastern quadrant of the Iberian Peninsula, in the so-called Ebro Valley, while the lagging regions (Ceuta and Melilla) are located in North Africa. In this sense, our findings seem to confirm the influence of the geographical localization of regions and municipalities on their SDG performance documented in the case of Italy by D'Adamo and Gastaldi [17] and D'Adamo et al. [16].

With regard to municipalities, the city of Madrid shows one of the strongest commitments to the 2030 Agenda. In addition to the city of Madrid, the most committed municipalities to the 2030 Agenda are A Coruña, Valencia, Barcelona, Donostia, Santander, Valladolid, Vitoria-Gasteiz and Bilbao, all of which are large cities, whereas the last positions correspond to Telde, Lugo, Avilés or Pontevedra, i.e., smaller cities that are only concerned with two or three SDGs. In this sense, the size of the municipality seems to positively affect the degree of commitment of local governments to the 2030 Agenda and the disclosure of information on initiatives related to the SDGs. This positive effect would be consistent with the findings obtained by Guillamón et al. [31] and García-Sánchez et al. [24], who found a significant positive relationship between the size of a municipality (measured by its population) and the level of disclosure of sustainability information. However, this contrasts with the findings of Navarro et al. and Alcaraz-Quiles et al. [30,50], who did not find a significant association. Similarly, Akande et al. [15] found no statistical relationship between the position of municipalities in the ranking of smart and sustainable European cities and their population.

In addition to the size of the municipalities, the influence of several sociodemographic factors can also explain both the priorities of the regions and municipalities in relation to the SDGs and their level of commitment to the 2030 Agenda. First is the percentage of the dependent population. From the standpoint of the overarching goal of ‘leave no one behind’ that characterizes the 2030 Agenda, the needs of the dependent population pose a number of challenges for municipalities, which, from the perspective of stakeholder theory, could explain a greater commitment to the SDGs and more transparency on sustainability [30,36]. This would explain why Cantabria and País Vasco, with an average level of dependent population of 60%, and Aragón, Navarra and La Rioja, with 57–58%, show a greater preference for those SDGs that are more related to people (SDG3, SDG4 and SDG5).

Second, population density affects the strength of stakeholder pressure [26], as the demand for public services and resources tends to be higher in more densely populated regions and municipalities [59]. In this respect, Alcaraz-Quiles et al. [36,50] found that those Spanish regions with a higher population density had higher levels of sustainability information disclosure. However, although, in our case, some of the regions most committed to the SDGs are just those with the highest population densities (e.g., Cantabria, País Vasco and Navarra), Melilla, the region with the second highest population density, shows the lowest level of commitment to the 2030 Agenda. The same applies to other factors, such as foreign population and unemployment rate, which, according to previous studies, have been shown to affect municipalities’ commitment to sustainability and information transparency. Regarding population density, our results are in line with those obtained by D’Adamo et al. [16], who also found no relationship between the Italian cities’ population densities and their performance in relation to the SDGs.

6. Concluding remarks

Given the important role that local governments play in global development and the achievement of the 2030 Agenda [9], in this study, we have analyzed the current state of commitment to the 2030 Agenda at the regional and local levels, as measured by the information on SDG-related initiatives disclosed by local governments through their websites. On this basis, we have analyzed the dynamic evolution by SDG, year and region, in order to identify the main priorities of their government agendas and the challenges to achieve the commitments of this global agenda by 2030.

The results show a low commitment of the Spanish municipalities to the SDGs (37.2% on average), although it increases significantly over the period, with differences in the priorities of the municipalities in terms of their emphasis on the different SDGs and their evolution over time. SDG8 and SDG11 stand out as the main priorities of the municipalities, while initiatives related to SDG5, SDG6 and SDG 17 are the least prioritized. The COVID-19 pandemic has marked a turning point in this regard, with greater importance being given to the SDGs that are more related to people and prosperity.

Our findings help citizens and public authorities to understand the degree of sustainability of regions and municipalities, assess their performance in relation to different dimensions of sustainability and identify the main challenges for future improvements. Specifically, by highlighting differences in the degree of commitment of Spanish municipalities and regions to the 2030 Agenda, our findings can guide policymakers in the design of policies aimed at improving SDG performance in those municipalities and regions with the lowest commitment levels, as well as show which SDGs should be emphasized by public policies. In particular, Spanish municipalities should improve their performance in relation to actions related to gender equality, clean water and sanitation, and partnerships, and the national government should favor investment in lagging regions and municipalities in order to improve their level of commitment to the SDGs and reduce inequalities. From an academic perspective, our findings provide support for the usefulness of stakeholder theory and institutional theory as a theoretical basis for explaining the commitment of municipalities and regions to the 2030 Agenda. The existence of differences in the degree of commitment of municipalities and regions to the 2030 Agenda, which, in our opinion, can be explained by differences in both sociodemographic and cultural characteristics, opens a way for the analysis of possible trajectories in the implementation of the SDGs at regional and local levels and the study of their determinants.

This research is not without limitations, mainly related to the sample. The sample is focused on a single country (Spain) and includes only the largest municipalities. Future studies could extend the scope of the analysis to other countries and include a larger number of municipalities. Future studies could also use econometric models to analyze the influence of the sociodemographic factors mentioned in this paper on the degree of commitment of municipalities to the SDGs. Additionally, this study could be replicated using other quantitative methods, such as multi-criteria decision analysis (MCDA). This method, which is widely used in healthcare decision-making and the evaluation of policy options, could be used to rank municipalities and regions according to their performance in terms of the SDGs and compare the results with those of this study. In this respect, MCDA has been used to compare performance in relation to the SDGs in the case of Italian cities [16,17], as well as across European countries [18].

Acknowledgments

Xunta de Galicia [Grant/Award Number: 2020 GPC GI-2016].

Conflict of interest

All authors declare no conflict of interest regarding the publication of this paper.



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ARTICLE 2. THE 2030 AGENDA IN LOCAL ENTITIES: DOES GENDER MATTER IN REPORTING ON THE SUSTAINABLE DEVELOPMENT GOALS?

a.- **Complete reference:** Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?. *Cities*, 141, 104461. Publisher: Elsevier. ISSN: 1873-6084. DOI: 10.1016/j.cities.2023.104461

b.- **Quality indexes:** The journal in which this article is published corresponds to level 1 (quartile Q1 of the JCR of Web of Science). In this case this journal is indexed in the SSCI in the category of Social Science. It has an impact factor of 6.7 in the 2022 JCR ranking (latest available year), and it is placed in the first quartile in the category Urban Studies (position 3/43).

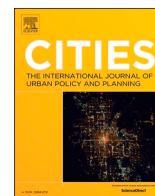
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d.- **Author's contribution:** In this article, the author of the Thesis has participated in the conceptualization of the subject of study, the election of the methodology, the data extraction, the empirical analysis, the writing, the project administration, and the incorporation of the changes suggested in the review process. The author of the Thesis contributed significantly to sections 1, 2, 3, 4, 5 and 6 of this article.

e.- **The specific chapter of the Thesis in which the contents of the publication are reproduced:** This article is partially reproduced in the Introduction, Objectives and hypotheses, Methodology, Discussion and Conclusions.

f.- **Names and affiliations of all the co-authors:** The first author (Manuel Rieiro García) is a PhD. student of the Economics and Business Doctoral Program on the University of Santiago de Compostela, and the co-authors Cristina Aibar Guzmán and Beatriz Aibar Guzmán are professors at the University of Santiago de Compostela.



The 2030 Agenda in local entities: Does gender matter in reporting on the Sustainable Development Goals?

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ARTICLE INFO

Keywords:

Local governments
2030 Agenda
Sustainable Development Goals
Women politicians
Women participation

ABSTRACT

This study analyses the influence of the gender of elected officials on the level of disclosure of information about the Sustainable Development Goals (SDGs) by Spanish local governments, using a binary gender classification (man/woman). The results obtained from the websites of 102 municipalities from 2016 to 2021 reveal that the fact that the mayor is a woman has a positive and significant effect on the disclosure of SDG information, while the effect of the gender diversity of the councillors is positive, but not significant. Furthermore, the tendency to disclose SDG information is higher in those municipalities led by a woman with a higher percentage of women councillors.

1. Introduction

In 2015, the United Nations (UN) General Assembly adopted an action plan entitled ‘Transforming our World: Agenda 2030 for Sustainable Development’, which sets out 17 Sustainable Development Goals (SDGs) and 169 targets to be achieved by member states by 2030, with a commitment to care for the planet and to contribute to the prosperity of people (UN, 2015). Thus, the SDGs symbolise ‘a major multilateral effort to shift the world towards more sustainable and resilient pathways’ (Caiado et al., 2018, p. 1276). This commitment to sustainable development is articulated vertically, from the most global to the most specific, involving all economic actors, public and private, in the achievement of SDGs (Verboven & Vanherck, 2016).

Public administrations at all levels of government are one of the most important actors for the achievement of the SDGs (Guha & Chakrabarti, 2019; Martínez-Córdoba et al., 2020). As signatories of the SDGs, national governments must define policies and programmes to operationalise the 2030 Agenda in the specific context of each country (Grover et al., 2018; Martínez-Leon et al., 2020). Thus, the public administrations’ role is twofold: on the one hand, as drivers of public policies that promote sustainable practices among citizens, companies, and other economic agents in the country (Ball & Grubnic, 2007; Navarro et al., 2010; Acuto et al., 2020) and, on the other hand, as examples

for these actors to follow by implementing sustainability actions (Škare & Golja, 2014) and integrating these practices into their management models (Fox et al., 2002; Masuda et al., 2021; Ribeiro et al., 2016).

In particular, local governments play an especially important role in contributing to the SDGs (Guha & Chakrabarti, 2019; Martínez-Córdoba et al., 2020), not only because their proximity to citizens facilitates the perception, analysis and resolution of social and environmental problems and challenges (Alcaraz-Quiles et al., 2015; García-Sánchez et al., 2013), but also because they are primarily responsible for the provision of certain services (e.g., water and waste management, public transport, parks and schools, social services) that are directly or indirectly related to the achievement of the SDGs (Martínez-Córdoba et al., 2020; Masuda et al., 2021). In turn, this commitment of local governments to the 2030 Agenda calls for the need to disclose information to different stakeholders on their contribution to the SDGs, with a dual focus (Marcuccio & Steccolini, 2005; Navarro-Galera et al., 2018): (i) public responsibility, as a demonstration to stakeholders of the entity’s commitment to sustainable development and the actions carried out in this regard, and (ii) sustainability, as a vehicle to move towards a fairer and more sustainable society.

Although the literature has analysed the role played by local entities in achieving sustainable development and the disclosure of sustainability information, as well as its determinants (García-Sánchez et al.,

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<https://doi.org/10.1016/j.cities.2023.104461>

Received 24 August 2022; Received in revised form 9 June 2023; Accepted 26 June 2023

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2013; Guillamón et al., 2011; Lopez-Subires et al., 2019; Navarro-Galera et al., 2018; Ribeiro et al., 2016), to our knowledge, no research has yet been conducted on the disclosure of information related to the 2030 Agenda and the SDGs, which contrasts with the notable interest that the study of these issues in the private sphere has aroused among academics (Garrido-Ruso et al., 2022).

On the other hand, the increasing participation of women in positions of political representation has led to changes not only in the power structure of municipalities, but also in the definition of public policies and resource management (Svaleryd, 2009; Duflou, 2012; Ennsner-Jednastik, 2017; Funk & Philips, 2019; Balaguer-Coll & Ivanova-Toneva, 2021), bringing a 'distinct voice' (Fox & Schuhmann, 1999; Gilligan, 1982) and a different sensitivity (Bratton & Ray, 2002). Several authors have highlighted the benefits derived from greater political participation of women in achieving sustainable development (Iyer & Mani, 2019; Medupin, 2020) and reducing social inequalities (Bolzendahl, 2009; Chen, 2010). Thus, in recent years a stream of research has been consolidated that focuses on analysing how the gender of elected officials affects public management (Hessami & da Fonseca, 2020; Park, 2021).

However, the role of women's leadership in relation to the 2030 Agenda and the SDGs is a 'developing topic' (Barrios et al., 2020), so there is an 'urgent need' to understand the gender role of key decision-makers in this area (UN, 2015). Considering that a municipality's decision to commit to the 2030 Agenda and disclose information on the SDGs can be explained as a result of the values and motivations of its key decision-makers (Marcuccio & Steccolini, 2005), in this paper we have sought to fill this gap in the literature by analysing the influence of the gender of elected officials in municipalities on the level of disclosure of information regarding the initiatives developed for the fulfilment of the 2030 Agenda in Spanish local governments. In this sense, the present study adopts a binary gender classification (man/woman), as the data available in municipalities' websites do not yet allow us to identify other gender categories. Thus, this study aims to contribute to the debate over whether the presence of women in politics makes a difference in terms of both transparency and sustainability.

We have focused on a single country in order to favour greater homogeneity in the results (García-Sánchez et al., 2013) and we have chosen Spain because it has been very active in the implementation of the SDGs and has shown a high commitment to the 2030 Agenda, placing it at the centre of government action. In Spain, there is still no regulation that forces local governments to disclose information on sustainability (Navarro-Galera et al., 2018). Consequently, the profile of the mayor and the city council plenary will have an important influence on such decisions. Furthermore, as in other countries, Spain has laws that promote gender equality in the public sphere. Specifically, the Constitutional Law 3/2007 of 22 March for effective equality between women and men incorporated the obligation of balanced representation between women and men, requiring that at least 40 % of the candidates on electoral lists for local councils be women (except in municipalities with fewer than 3000 inhabitants). As a result of its enforcement, gender parity is reported to be relatively high in Spanish municipal corporations (Bolívar et al., 2018; Martínez-Córdoba et al., 2022).

The results obtained from the content analysis of the information disclosed in relation to the 2030 Agenda on the websites of 102 municipalities during the period 2016 to 2021 (a balanced data panel of 612 observations) reveal that the fact that the mayor is a woman has a positive and significant effect on the disclosure of information on the SDGs, while the effect of the gender diversity of the councillors is positive, but not significant. Furthermore, the results obtained show that the rate of disclosure on the SDGs in Spanish municipalities is still low, with an average disclosure of 22 items out of the 60 considered.

This article is structured as follows: after this introduction, the second section presents the theoretical framework from which the research hypotheses are developed. The third section is dedicated to presenting the characteristics of the empirical study (sample, method, and model).

The fourth section presents and discusses the main results of the study. Finally, the fifth section presents the conclusions and discusses the implications of the results, as well as their limitations and possible future extensions.

2. Theoretical framework, literature review and research hypotheses

2.1. Theoretical framework

The influence of women's leadership on organisational behaviour in relation to sustainability is explained by several theories, such as feminist caring theory, social role theory, and gender identity theory, resource dependence theory, and upper echelons theory. Some authors (e.g., Monteiro et al., 2022) argue that a single theory cannot fully explain the effect of women's leadership on sustainability proactivity and suggest combining several theoretical perspectives. Following this approach, we rely on social role theory, upper echelons theory, and resource dependence theory to analyse the effect of women's formal political representation in city councils on the disclosure of SDG information.

According to social role theory, 'the beliefs that people hold about the sexes [...] constitute gender roles, which, through a variety of mediating processes, foster real differences in behaviour' (Eagly et al., 2000, p. 124). Thus, internalised gender stereotypes lead to differences in the behaviour of women and men (Eagly & Wood, 2012). Under these stereotypes, women are supposed to be more concerned about morality and ethics, more empathetic, more averse to inequalities and more socially and environmentally sensitive (Araujo & Tejedó-Romero, 2018; Hamidullah et al., 2015). These stereotypes condition the behaviour and decision making of women leaders (Cuadrado-Ballesteros et al., 2021; Monteiro et al., 2022), thereby permeating political practice (Martínez-Córdoba et al., 2022). Thus, under the understanding of this theory, we would expect that women, as mayors and councillors, would prioritise the needs of the most deprived citizens and social policies and a fairer and more sustainable management of natural resources by the municipality (Bolívar et al., 2018; Mandara et al., 2017).

Upper echelons theory posits that the demographic traits and experiences of people in leadership positions in an organisation shape their values and management styles, which in turn influence their decisions (Hambrick & Mason, 1984). From the perspective of this theory, the policies and actions carried out by municipalities are influenced by the preferences and priorities of their mayors, which, in turn, are derived from their personal traits, such as age, gender or educational level (Bolívar et al., 2018). Among these characteristics, gender is of considerable relevance, as it affects the mayor's predisposition towards a certain type of action or set of policies over others (Holman, 2014; Ryan et al., 2005).

According to dependence resource theory (Pfeffer & Salancik, 1978), women bring distinctive resources and capabilities to organizations (e.g., knowledge, expertise, skills). From this perspective, the presence of women in municipalities, as mayors or as council members, provides a different viewpoint to management (García-Sánchez et al., 2023) and favours stakeholder orientation (Alonso-Almeida et al., 2015).

2.2. Literature review and hypotheses development

In relation to the gender of the leader of an organisation, in the business sphere it has been shown that having a woman chief executive officer (CEO) positively affects the development of corporate social responsibility practices and information transparency of a company (Lewis et al., 2014; Gallego-Sosa et al., 2021). As regards the 2030 Agenda, García-Sánchez et al. (2023) show that firms with a woman CEO and/or chairperson of the board of directors, as well as those characterised by greater gender diversity on the board and in management teams, show a higher degree of commitment to the 2030 Agenda.

In the public sphere, the increase in women's formal political representation resulting from gender quota laws has generated a huge interest in studying the impact that women have on the functioning and policy-making of municipalities (Araujo & Tejedo-Romero, 2018; Andreoli et al., 2022; Gómez-Miranda et al., 2022). In other words, whether women's participation in local politics goes beyond descriptive representation to substantive representation in a way that makes a difference (Cabaleiro-Casal & Buch-Gómez, 2020; Martínez-Córdoba et al., 2022).

The mayor is the head of the municipality and has a significant influence on the decisions regarding the actions and policies to be implemented, as well as on the municipal management model (Balaguer-Coll & Ivanova-Toneva, 2021; Bolívar et al., 2018). Furthermore, in the case of Spain, the mayor plays a key role in the definition and implementation of the municipality's social and sustainability policies (Hernández-Nicolás et al., 2018) and in the transparency of information (Herrero-Gutiérrez et al., 2021).

As regards women mayors, in Brazilian municipalities, Funk and Philips (2019) documented statistically significant differences between the way men and women mayors allocate resources to specific policy areas, with women mayors spending more resources on education, health care and social assistance, and less on transport and urban development, in comparison to men mayors. In Spain, Hernández-Nicolás et al. (2018) found that women-led municipalities spend more on policies related to security, protection, and social welfare than men-led municipalities, and Gómez-Miranda et al. (2022) reported that municipalities led by women have a lower risk of default. Other studies show a positive influence of women mayors on the information transparency of local governments. Sjöberg (2010) found a (weak) positive influence of women mayors on local government transparency in Chilean municipalities. Tavares and da Cruz (2020) found that Portuguese municipalities led by women mayors show higher levels of information transparency than those led by men mayors. Araujo and Tejedo-Romero (2018), Benito et al. (2021), and Herrero-Gutiérrez et al. (2021) documented the same finding in the Spanish context.

Accordingly, we consider that the gender of the mayor will influence the municipality's engagement with and disclosure of information on the SDGs and therefore the following hypothesis is stated:

H1. SDG reporting is higher in municipalities governed by women.

The city council plenary plays a role of control and monitoring of the mayor's performance, being responsible for approving the municipality's budget and local policies (Bolívar et al., 2018). In this sense, previous studies have concluded that a balanced gender representation in the municipal plenary (i.e., the percentage of women councillors out of the total number of councillors that compose the municipal corporation) influences the strategic decisions taken in the plenary, affecting the management models of the city council (Araujo & Tejedo-Romero, 2018). In other words, women's participation in local governments as council members may also affect their functioning and local policy-making (Bolzendahl, 2009; Enns-Jedenastik, 2017; Holman, 2014; Iyer & Mani, 2019; Slegten et al., 2019).

Cabaleiro-Casal and Buch-Gómez (2020), in Spain, and Andreoli et al. (2022), in Italy, showed that the percentage of women councillors is positively associated with municipal efficiency. Svaleryd (2009) found that the presence of women in Swedish local governments affects their spending patterns, as male and female councillors prioritise different spending categories. Likewise, Funk and Philips (2019) showed that women's representation in Brazilian municipalities has a significant influence on the allocation of spending, with a higher percentage of women councillors increasing spending on education, health, and social care, compared to other policy areas. In a similar vein, Andreoli et al. (2022) found that a higher proportion of women in Italian municipalities favours spending on public security services and reduces the cost of administration, while, also in the Italian local context, Ordine et al. (2023) showed that the increase in women's participation leads to a

reduction in overall public spending which mainly affects areas such as road maintenance, but not those related to women's needs. Finally, Gómez-Miranda et al. (2022) documented a negative association between the proportion of women councillors in Spanish municipalities and their risk of default. Other authors have analysed the influence of women councillors on information transparency. Thus, in Spain, Araujo and Tejedo-Romero (2018) showed that the participation of women in local governments favours information transparency.

Therefore, it is logical to assume that the characteristics of the plenary will also affect the commitment of the city council to the 2030 Agenda and the disclosure of information about it. Consequently, and based on the above, the following hypothesis is proposed:

H2. SDG reporting is higher in municipalities with a higher percentage of women councillors.

Araujo and Tejedo-Romero (2018) argue that power dynamics in public entities may strengthen or lessen the influence that women mayors and women councillors may exert in their organizations. Considering that as a result of gender homophily, 'a positive interaction' occurs between women in different leadership positions, which translates into better governance and the promotion of social and environmental initiatives (Birindelli et al., 2019), several studies have analysed whether the influence of women mayor on local policies is strengthened by a balanced gender representation in the municipal plenary (i.e., a higher percentage of women councillors). In this regard, Balaguer-Coll and Ivanova-Toneva (2021) found that, in Spanish municipalities, women mayors have a significant effect on budgetary stability and financial sustainability only when the proportion of women councillors is high, and in the same context Gómez-Miranda et al. (2022) showed that gender alignment between mayor and councillors have a positive effect the reduction of the risk of default. Finally, Araujo and Tejedo-Romero (2018) obtained a similar finding, considering the level of transparency.

Thus, we consider that a higher presence of women in the municipal plenary will have a positive moderating effect on the influence exerted by women mayors on the municipality's engagement with and disclosure of information on the SDGs and therefore the following hypothesis is stated:

H3. SDG reporting is higher in municipalities led by women majors and with a greater women's representation.

Carozzi and Gago (2023) note that women in politics are compelled to adopt what has been termed 'normative masculine behaviour' to prosper and show that right-wing women politicians are more likely to conform to 'normative masculinity' than their left-wing counterparts. In this respect, Cabaleiro-Casal and Buch-Gómez (2020) documented an 'interactive effect' on budget policy between the political ideology (right-wing) and women's representation in Spanish municipalities, so that women right-wing politicians (mayors and councillors) promote lower levels of current spending relative to non-social spending in Spanish municipalities. However, Araujo and Tejedo-Romero (2018) found that the political ideology does not affect the role played by women mayors with regard information transparency. With these premises, in this study we will also try to test whether the political ideology of women politicians affects the degree to which they promote commitment to the 2030 Agenda and the disclosure of information on the SDGs in their municipalities, although we do not put forward any hypotheses in this regard.

Fig. 1 summarises the proposed model.

3. Methods

3.1. Sample

For this study, we have focused on large Spanish municipalities, establishing this criterion based on population (Martínez-Córdoba et al., 2020; Navarro-Galera et al., 2018). This choice is motivated by the fact

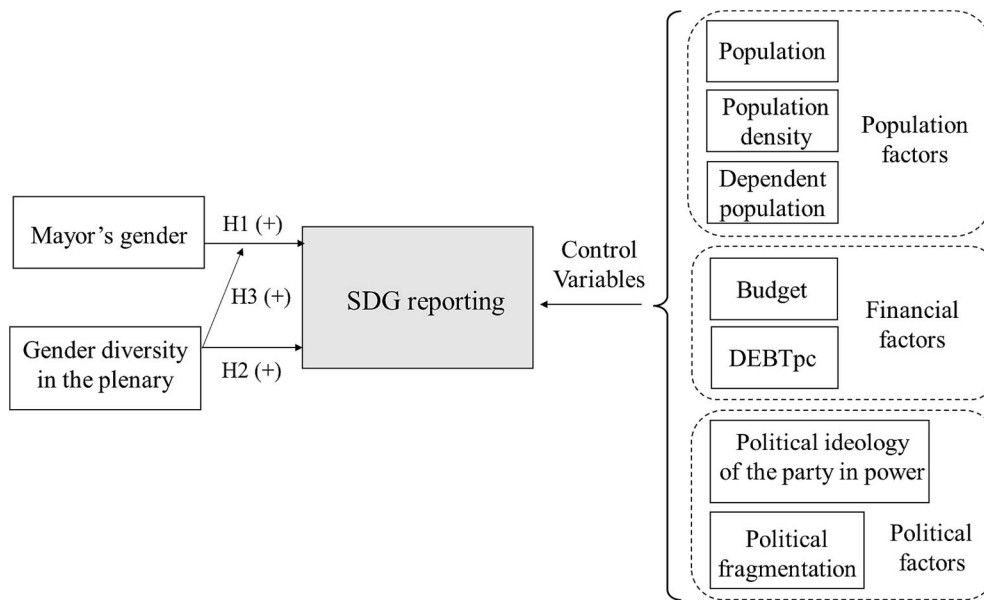


Fig. 1. Research model.

that these municipalities are the most likely to produce and disclose economic, social, and environmental information, both because of their greater visibility and the availability of the human and technological resources needed to do so (García-Sánchez et al., 2013).

Following García-Sánchez et al. (2013) and Bolívar et al. (2018), municipalities were selected based on the definition of Article 121 of Law 57/2003, which defines large municipalities as the following: a) with a population of >250,000 inhabitants; b) provincial capitals with a population of >175,000 inhabitants; c) provincial capitals, regional capitals or seats of regional institutions; and d) municipalities with a population of >75,000 inhabitants, that have special economic, social, historical or cultural circumstances.

The Spanish public sector is divided into three levels: the State, the Regions (17) and the Local Governments, divided into 50 provinces, 2 autonomous cities and 8129 municipalities. Each municipality has its own mayor and a municipal corporation, composed by the councillors that compose the plenary.

The empirical study used data from the period 2016–2021, which covers the period from the entry into force of the 2030 Agenda to the latest year with available data. The information necessary to carry out the study was obtained through the methodology of content analysis of the different websites of the Spanish municipalities included in the sample. This method is widely used in the field of Corporate Social Responsibility (CSR) research (Alcaraz-Quiles et al., 2015; García-Sánchez et al., 2013), with the aim of codifying qualitative information into quantitative scales.

The analysis of the information was carried out separately by each of the authors, who reviewed the different sources of information and coded the data to subsequently discuss the differences and harmonise the results. To avoid possible biases in obtaining the information, a

common analysis methodology was defined, which is summarised in Fig. 2:

- 1) The city council's website is visited and then, each area is consulted to search for the information of the item whose existence is to be verified.
- 2) If the information of the item is located without using the website internal search, a value of 1 is assigned for those years where applicable and a value of 0 otherwise.
- 3) In case that the item cannot be located directly, or a year is not available, the website internal search will be used, carrying out a search by key words (previously agreed). The results obtained were used to check whether the information on the item is available, giving a value of 1 to the corresponding years and a value of 0 to those years for which it has not been possible to locate the information.

This method of value assignment for content analysis has been used in other similar studies (Navarro et al., 2010; Navarro-Galera et al., 2018), so we consider it is a robust method for this study.

Regarding the independent and control variables, the information was obtained from the websites of the local councils and secondary sources (official public statistical bodies and databases) were used to obtain the information not available on the websites.

3.2. Variables

3.2.1. Dependent variable: extent of disclosure of information on the SDGs

Following previous studies (e.g., De Iorio et al., 2022; Navarro et al., 2010), we developed an index to measure the degree of SDG disclosure

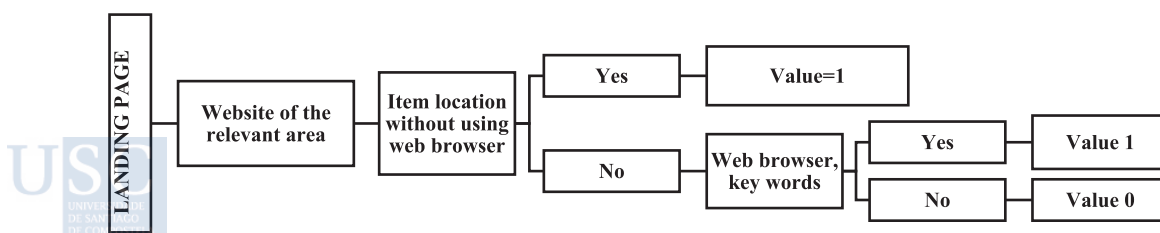


Fig. 2. Content analysis procedure of local councils' websites.

by municipalities, called the Sustainable Development Goals Disclosure Index (SDGDI). This index is based on 60 items, organised by the different goals (Annex), identified from a review of the available literature on the subject and supported by the list of the 17 SDGs and their targets. It a composite index computed according to the following formula:

$$SDGDI_{i,t} = \frac{\sum_{n=60}^{j=1} \text{Item}}{60}$$

A similar proposal has also been used in the corporate sphere by García-Sánchez et al. (2013), considering 50 items of corporate responsibility practices linked to different SDGs.

3.2.2. Independent and control variables

The independent variables of the model represented in Eq. (1) refer to the gender of the elected officials of the municipalities: the gender of the mayor (MGEN) and the gender diversity of the council (WCOUN). Likewise, to avoid biased results and following previous literature (García-Sánchez et al., 2013; Martínez-Córdoba et al., 2020; Navarro-Galera et al., 2018; Rieiro-García et al., 2023), a set of control variables related to political-institutional, population and financial factors that condition the performance of local councils have been included in the model.

In relation to political-institutional factors, we have included the political ideology of the governing party (MIDEO) and the political fragmentation of the municipality (HHI). Both factors influence the policies and decisions made in the government of a local entity and condition its political agenda (Aguilera et al., 2021). The population is an important axis when it comes to the elaboration of public policies and the disclosure of information by local entities, since citizens are the principal beneficiaries of their management and their main stakeholders. Within the population factors, we have included three variables: the total population of the municipality (LNPOPU), the population density (PDEN), and the dependent population (PDEP).

Regarding the financial variables, the financial situation of the municipality has a high influence on its management, affecting the development of sustainability actions and information transparency by local governments (Alcaraz-Quiles et al., 2015; Navarro-Galera et al., 2018). In this case, we have considered the municipality's approved annual gross expenditure budget (BUDGET) and the debt per capita (DEBTpc),

as we understand that the actions carried out and the services offered are conditioned by the level of resources available (García-Sánchez et al., 2013).

Table 1 shows the definition and measurement of the independent and control variables included in the model, as well as some previous studies that have used these variables.

3.3. Model specifications

Two models were proposed to estimate the effect of the gender of local government elected officials on the disclosure of information on the 2030 Agenda by Spanish municipalities and to test the research hypotheses. The first model, shown in Eq. (1), aims to analyse the individual effect of women's political representation (women mayors and councillors).

$$SDGDI_{i,t} = \beta_0 + (\beta_1 * MGEN_{i,t}) + (\beta_2 * WCOUN_{i,t}) + (\beta_3 * MIDEO_{i,t}) + (\beta_4 * IHH_{i,t}) + (\beta_5 * DEBT_{pc,t}) + (\beta_6 * BUDGET_{i,t}) + (\beta_7 * PDEP_{i,t}) + (\beta_8 * PDENS_{i,t}) + (\beta_9 * LNPOPU_{i,t}) + (\beta_{10} * Year_{i,t}) + \mu_i + \epsilon_{i,t} \tag{1}$$

where i identifies the municipality and t the year, μ represents the unobservable heterogeneity and ϵ is the linear estimation disturbance or residual. In addition, to control the time effect we include the numeric variable Year that identifies the years of the study period.

β_i are the coefficients that quantify the effect of the independent and control variables on the dependent variable. Thus, the validation of the research hypotheses will be established by the sign (positive or negative) and the significance of β_1 , β_2 and β_3 . Given the censored nature of the dependent variable, Tobit regression for panel data has been used to perform the analysis.

The second model, shown in Eq. (2), aims to analyse whether a positive interaction occurs between women in leadership positions, including the interaction between the two gender variables (MGEN*WCOUN). Furthermore, Eq. (2) also includes the interaction between the gender variables and the political ideology of the governing party (MGEN*MIDEO and WCOUN*MIDEO), which will allow us to analyse the moderating effect that the political ideology of the governing party may have on the influence of the gender of elected officials on the disclosure of information on the SDGs.

Table 1
Independent and control variables' definitions and measurement.

Variable	Acronym	Definition	Measurement	Previous studies
Independent variables				
Gender of councillor	MGEN	Gender of mayor	0 = Male; 1 = Female	Araujo and Tejedo-Romero (2018); Balaguer-Coll and Ivanova-Toneva (2021); Cuadrado-Ballesteros et al. (2021)
Gender diversity of the city council	WCOUN	Percentage of women councillors in the plenary.	Women councillors/T7total councillors	Araujo and Tejedo-Romero (2018), Balaguer-Coll and Ivanova-Toneva (2021); Cuadrado-Ballesteros et al. (2021)
Control variables				
Political ideology of the governing party	MIDEO	Ideology of the mayor	0 = Right; 1 = Left	Guillamón et al. (2011); García-Sánchez et al. (2013); Bolívar et al. (2018).
Political fragmentation of the city council	HHI	Herfindahl's Index as an indicator of political fragmentation	$HHI = (\text{Governing party councillors})^2 / (\text{Total councillors in plenary session})^2$	García-Sánchez et al. (2013); Cuadrado-Ballesteros et al. (2021).
Level of debt	DEBTpc	Debt at the end of the year	Debt/Total population	Benito et al. (2021)
Budget	BUDGET	The municipality's approved annual gross expenditure budget	Millions of euros	García-Sánchez et al. (2013)
Population	LNPOPU	Population resident in the municipality	Napierian logarithm of the population	Bolívar et al. (2018); Lopez-Subires et al. (2019).
Dependent population	PDEP	Percentage of population dependent on the municipality	Population under 15 and over 65/ Population aged 16–64 years	Navarro-Galera et al. (2018).
Population density	PDEN	Population density of the municipality, in number of inhabitants per km ² of municipal area.	Number of inhabitants/municipal extension (km ²)	Lopez-Subires et al. (2019); Martínez-Córdoba et al. (2020)

$$\begin{aligned}
 SDGDI_{i,t} = & \beta_0 + (\beta_1 * MGEN_{i,t}) + (\beta_2 * WCOUN_{i,t}) \\
 & + (\beta_3 * MGEN * WCOUN_{i,t}) + (\beta_4 * MIDEO_{i,t}) \\
 & + (\beta_5 * MGEN * MIDEO_{i,t}) + (\beta_6 * WCOUN * MIDEO_{i,t}) \\
 & + (\beta_7 * HHI_{i,t}) + (\beta_8 * DEBT_{PCi,t}) + (\beta_9 * BUDGET_{i,t}) \\
 & + (\beta_{10} * PDEPi_{i,t}) + (\beta_{11} * PDENSi_{i,t}) + (\beta_{12} * LNPOPU_{i,t}) \\
 & + (\beta_{13} * Year) + \mu_i + \epsilon_i, t
 \end{aligned} \tag{2}$$

Finally, to confirm the robustness of the results, three variants of the first model (Eq. (1)) are proposed, disaggregating the dependent variable (SDGDI) into three disclosure sets, according to the dimension of the information disclosed: environmental (SDGDI_E), social (SDGDI_S) and governance (SDGDI_G). To this end, the items related to each SDG were grouped according to their linkage to these dimensions as follows (UN, 2015; Rieiro-García et al., 2023): the items related to SDG 6, SDG 7 and SDG 13–15 were included in the environmental dimension (SDGDI_E); the items related to SDG 1, SDG 2, SDG 3, SDG 4 and SDG 5 were included in the social dimension (SDGDI_S); and the items related to SDG 8, SDG 11 and SDG 17 were included in the governance dimension (SDGDI_G).

For this purpose, Eqs. (3), (4), and (5) are proposed, including the same independent and control variables as in Eq. (1).

$$\begin{aligned}
 SDGDI_E_{i,t} = & \beta_0 + (\beta_1 * MGEN_{i,t}) + (\beta_2 * WCOUN_{i,t}) + (\beta_3 * MIDEO_{i,t}) \\
 & + (\beta_4 * HHI_{i,t}) + (\beta_5 * DEBT_{PCi,t}) + (\beta_6 * BUDGET_{i,t}) \\
 & + (\beta_7 * PDEPi_{i,t}) + (\beta_8 * PDENSi_{i,t}) + (\beta_9 * LNPOPU_{i,t}) \\
 & + (\beta_{10} * Year) + \mu_i + \epsilon_i, t
 \end{aligned} \tag{3}$$

$$\begin{aligned}
 SDGDI_S_{i,t} = & \beta_0 + (\beta_1 * MGEN_{i,t}) + (\beta_2 * WCOUN_{i,t}) + (\beta_3 * MIDEO_{i,t}) \\
 & + (\beta_4 * HHI_{i,t}) + (\beta_5 * DEBT_{PCi,t}) + (\beta_6 * BUDGET_{i,t}) \\
 & + (\beta_7 * PDEPi_{i,t}) + (\beta_8 * PDENSi_{i,t}) + (\beta_9 * LNPOPU_{i,t}) \\
 & + (\beta_{10} * Year) + \mu_i + \epsilon_i, t
 \end{aligned} \tag{4}$$

$$\begin{aligned}
 SDGDI_G_{i,t} = & \beta_0 + (\beta_1 * MGEN_{i,t}) + (\beta_2 * WCOUN_{i,t}) + (\beta_3 * MIDEO_{i,t}) \\
 & + (\beta_4 * HHI_{i,t}) + (\beta_5 * DEBT_{PCi,t}) + (\beta_6 * BUDGET_{i,t}) \\
 & + (\beta_7 * PDEPi_{i,t}) + (\beta_8 * PDENSi_{i,t}) \\
 & + (\beta_9 * LNPOPU_{i,t}) + (\beta_{10} * Year) + \mu_i + \epsilon_i, t
 \end{aligned} \tag{5}$$

4. Results

Table 2 shows the descriptive statistics of the variables included in the analysis. It can be observed that only 27.5 % of the municipalities have a woman mayor and 45.64 % of the councillors are women. With respect to the other political-institutional characteristics, there is a predominance of left-wing parties (67.3 %), and a high degree of political competition in the city councils, with a low concentration index (0.154), i.e., the number of councillors from the governing party is significantly low in relation to the total number of councillors in the plenary.

Table 2
Descriptive statistics.

Variables	Mean	Std. dev.	Min	Max
SDGDI	22.00	6.6092	6.00	49.00
MGEN	0.2745	0.4466	0.00	1.00
WCOUN	45.6407	4.9161	28.00	66.67
MIDEO	0.6732	0.4694	0.00	1.00
HHI	0.1542	0.9261	0.0093	0.5486
LNPOPU	11.9183	0.6844	11.1980	15.0199
PDEP	52.8529	5.4485	36.00	67.00
PDEN	2989.75	3540.7460		19,808.00
DEBTpc	554.6808	696.8143	0.00	4266.536
BUDGET	259,456.10	571,449.30	51,663.76	5416.928.00

On the other hand, Table 2 also shows that the Sustainability Disclosure Index (SDGDI) has an average disclosure value of 22 out of the 60 items considered (36.67 %), ranging from 6 items (10 %) in the municipalities that disclose the least information on the SDGs to 49 items (83.33 %) in the municipalities that disclose the most information related to the 2030 Agenda. Fig. 3 shows the annual evolution of the values observed for this variable, which shows an increase in each of the years of the index distribution, with most of the values concentrated in the higher ranges for each of the years.

Table 3 shows the correlation between the variables included in the model. As can be seen, there are no major problems of multicollinearity between the variables.

Table 4 shows the results of the estimation of Eq. (1). It can be seen that the gender of the mayor has a significant effect on the information disclosed by the municipality (coeff. = 1.33557), with a confidence level of 95 %. This result confirms hypothesis H1, which states that SDG reporting is higher in municipalities governed by women. On the other hand, we did not find a significant effect of the gender diversity of the municipal corporation on the disclosure of SDG information (coeff. = 0.04103), which does not allow us to confirm hypothesis H2, which states that SDG reporting is greater in municipalities with a higher percentage of women in the municipal corporation.

Regarding the control variables, the results show that the disclosure of information on sustainability is higher in municipalities where the governing party has a left-wing ideology. In terms of population factors, larger municipalities (with more population) and those with a higher percentage of dependent population and a higher population density tend to disclose more information on the SDGs.

Table 5 shows the results of the estimation of Eq. (2). As can be seen at the individual level, the fact that the mayor is a woman continues to have a positive and significant effect on SDG reporting, while the effect of the gender diversity of the city council plenary is still positive, but not significant. Furthermore, the interaction between the gender of the mayor and the percentage of women councillors in the municipal plenary is found to have a significant effect on SDG reporting, with >99 % confidence. That is, in those municipalities governed by a woman that also have a higher degree of diversity in the plenary, the tendency to disclose information on sustainability will be greater (coeff. = 0.31105). This result confirms hypothesis H3, which states that SDG reporting is higher in municipalities led by women majors and with a greater women's representation.

However, no evidence was found regarding a significant influence of the government party's ideology on the effect of mayor gender (coeff. = -0.80705) and the percentage of women councillors (coeff. = -0.70007) on the disclosure of information on the SDGs. Furthermore, the effect of the size of the municipality (coeff. = 3.07549), the percentage of dependent population (coeff. = 0.14305), and the population density (coeff. = 0.00013) on the level of disclosure of information in relation to the 2030 Agenda is still significant, an influence that extends to the municipality's budget (coeff. = 0.00151).

The results for the three variants of Eq. (1) are shown in Table 6. In relation to the mayor's gender, it is observed that the overall positive effect of women mayors on SDG reporting is maintained for the social and governance dimensions, so that in those municipalities governed by women a greater amount of information on social and governance issues is disclosed, although this positive effect is not significant for environmental information. Likewise, there is still no significant effect of the gender diversity of the municipal corporation on the disclosure of information in each of the dimensions (environmental, social, and governance) considered individually.

As for the control variables, it is observed that there is a significant effect on the social information disclosed by local councils when the governing party is progressive or left-wing. Furthermore, there is a negative and significant effect of the political fragmentation of the local council on the disclosure of social information. This means that the less politically fragmented the local council is, that is, the stronger the

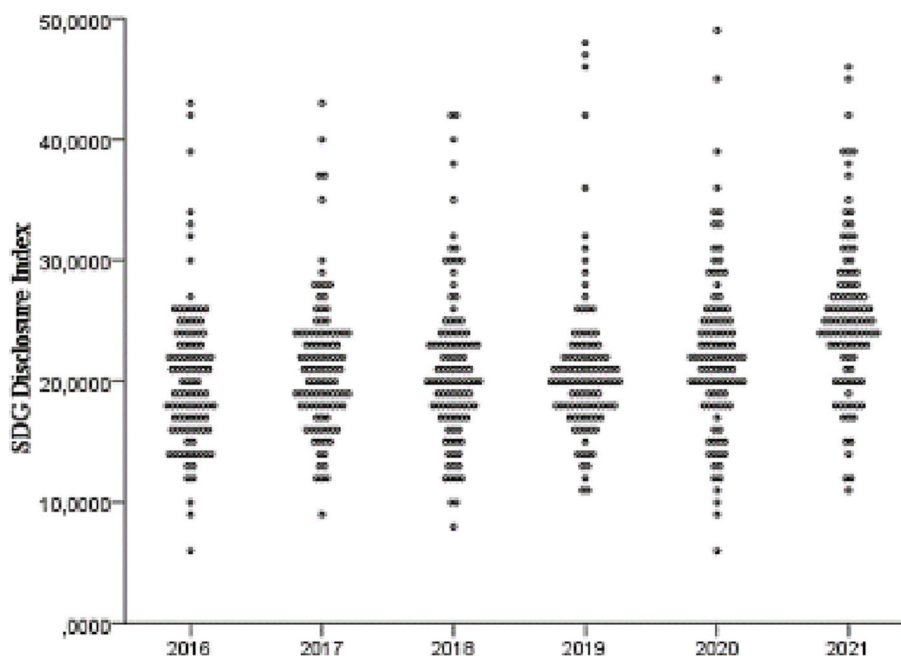


Fig. 3. Average value of SDG Disclosure Index (2016–2021).

Table 3
Pearson correlations.

	SDGDI	MGEN	WCOUN	MIDEO	HHI	LNPOPU	DEBTpc	BUDGET	PDEP	PDEN
SDGDI	1.000									
MGEN	0.1403***	1.000								
WCOUN	0.0503	0.1793***	1.000							
MIDEO	0.1366***	0.1710***	0.0287	1.000						
HHI	-0.0981**	-0.0069	-0.0060	-0.1888***	1.000					
LNPOPU	0.4406***	-0.0342	-0.0962**	0.0573	-0.1461***	1.000				
DEBTpc	0.0094	-0.0694*	-0.0042	-0.0579	-0.0137	-0.0146	1.000			
BUDGET	0.3797***	0.0710*	0.0456	0.0015	-0.1351***	0.7291***	0.0393	1.000		
PDEP	0.2074***	0.1061***	-0.0446	-0.0476	-0.0400	0.1172***	-0.0184	0.0361	1.000	
PDEN	0.2416***	0.2136***	0.0607	0.1770***	0.1322***	0.2652***	-0.0386	0.2632***	0.2177***	1.000

Significance: ***p < 0.01; **p < 0.05; *p < 0.10.

governing party is (for example, when it has an absolute majority), the less social information is disclosed. Finally, it is observed that the effect of population is significant for the disclosure of the three dimensions of information, and that the percentage of dependent population, population density and debt have a significant impact on the disclosure of social information. In addition, there is a significant negative effect of the municipality's budget on the disclosure of environmental and social information, suggesting that lower budgets are associated with lower levels of disclosure.

5. Discussion

5.1. Summary of results

Our results show a balanced gender representation in the council's municipal plenary, with an average of 45.64 % of women councillors. This percentage is slightly higher than those obtained in previous studies (e.g., Balaguer-Coll & Ivanova-Toneva, 2021; Cuadrado-Ballesteros et al., 2021; Herrero-Gutiérrez et al., 2021) and reflects the positive effect of the legal obligation of a balanced representation of women and men on electoral lists. This positive effect of legal gender quotas was also documented by Andreoli et al. (2022) in the Italian local sector. However, the fact that only 27.5 % of the municipalities have a woman mayor suggests that women tend to occupy secondary positions on

electoral lists (Martínez-Córdoba et al., 2022), which confirms that, as Bagues and Campa (2021) point out, quota laws are not sufficiently effective in promoting women's empowerment in leadership positions, such as mayoral roles.

In relation to the control variables, our findings are in line with those obtained by prior studies (e.g., Alcaraz-Quiles et al., 2015; García-Sánchez et al., 2013; Guillamón et al., 2011; Rieiro-García et al., 2023), who also documented a positive effect of population factors on sustainability disclosure, although contrast with those obtained by Araujo and Tejedo-Romero (2018) and Benito et al. (2021) with respect to the effect of political ideology.

As regards the research hypotheses, our results indicate that, in line with our first hypothesis (H1), SDG reporting is higher in municipalities governed by women. This suggests that, as shown by Guillamón et al. (2011), Araujo and Tejedo-Romero (2016), Araujo and Tejedo-Romero (2018), Benito et al. (2021), and Herrero-Gutiérrez et al. (2021), the gender of the mayor affects municipal transparency in such a way that information disclosure is higher in municipalities where a woman holds the position of mayor. Furthermore, our finding confirms those obtained by García-Sánchez et al. (2023) regarding the positive effect of women leaders on SDG disclosure in the business context.

However, our findings indicate that, contrary to what H2 proposed, the gender diversity of the municipal corporation does not affect the disclosure of SDG information. Thus, in our case, gender diversity

Table 4
Regression results (Eq. (1)).

Variable	Coeff. (Std. dv.)
MGEN	1.33557** (0.52936)
WCOUN	0.04103 (0.04739)
MIDEO	1.09838** (0.50583)
HHI	-3.49877 (2.60292)
LNPOPU	3.12904*** (0.50322)
PDEP	0.1478*** (0.04352)
PDEN	0.00013* (0.00007)
DEBTpc	-0.00037 (0.2821)
BUDGET	0.00119* (0.0006)
Constant	-28.76769*** (6.85382)

LR $\chi^2 = 214.78$.
Log likelihood = -1916.247.
p-Value = 0.0000.
Significance: ***p < 0.01; **p < 0.05; *p < 0.10.

Table 5
Regression results (Eq. (2)).

Variable	Coeff. (Std. dv.)
MGEN	-12.55336** (0.52936)
WCOUN	-0.03741 (0.08936)
MGEN*WCOUN	0.31105*** (0.11050)
MIDEO	1.4010 (4.73544)
MIDEO*MGEN	-0.80705 (0.5205)
MIDEO*WCOUN	-0.00074 (0.09943)
HHI	-2.95672 (2.59524)
LNPOPU	3.07549*** (0.5000)
PDEP	0.14305*** (0.04339)
PDEN	0.00013* (0.00007)
DEBTpc	-0.00031 (0.00034)
BUDGET	0.00151** (0.00062)
Constant	-24.45998*** (6.85382)

LR $\chi^2 = 223.32$.
Log likelihood = -1911.9766.
p-Value = 0.0000.
Significance: ***p < 0.01; **p < 0.05; *p < 0.10.

positively affects the disclosure of information on the municipality's commitment to the 2030 Agenda, but not statistically significantly. This finding is consistent with the correlation between gender diversity (WCOUN) and the degree of sustainability disclosure (SDGDI) presented in Table 3, where a positive but non-significant correlation was found (Pearson's coefficient = 0.0503, p-value > 0.10). Therefore, there is no evidence of a direct causal relationship between both variables, so that, as far our sample is concerned, it cannot be affirmed that a lower

Table 6
Robust results (Eqs. (3), (4) and (5)).

Variable	SDGDI_E (Eq. (3))	SDGDI_S (Eq. (4))	SDGDI_G (Eq. (5))
	Coeff. (Std. dv.)	Coeff. (Std. dv.)	Coeff. (Std. dv.)
MGEN	0.09582 (0.24206)	0.80006** (0.34393)	0.43969*** (0.14762)
WCOUN	0.01317 (0.02162)	0.02534 (0.03072)	0.00251 (0.01319)
MIDEO	0.04244 (0.23128)	0.78365** (0.32862)	0.27229* (0.14105)
HHI	0.59909 (1.17689)	-4.54614*** (1.67220)	0.44827 (0.71771)
LNPOPU	1.08388*** (0.22753)	1.35156*** (0.32329)	0.69360*** (0.22753)
PDEP	-0.00351 (0.01968)	0.15270*** (0.02796)	-0.00139* (0.01968)
PDEN	0.00003 (0.00003)	0.00014*** (0.00005)	-0.00004* (0.00002)
DEBTpc	0.00023 (0.00016)	-0.00049** (0.00022)	-0.00011 (0.00009)
BUDGET	-0.00057** (0.00027)	-0.00160*** (0.00027)	0.00016 (0.00016)
Constant	-6.96640** (3.09890)	-16.25974*** (3.09890)	-6.96640*** (3.09890)
	LR $\chi^2 = 36.84$	LR $\chi^2 = 250.67$	LR $\chi^2 = 124.44$
	Log likelihood = -1430.4674	Log likelihood = -1645.4435	Log likelihood = -1127.7979
	p-Value = 0.0001	p-Value = 0.0000	p-Value = 0.0000

Significance: *** p < 0.01; ** p < 0.05; * p < 0.10.

percentage of women councillors in the municipalities causes a lower degree of sustainability disclosure. This result contradicts those obtained by Araujo and Tejedo-Romero (2016) and Araujo and Tejedo-Romero (2018), who documented a positive effect of the number of women councillors on information transparency in municipalities, although it is consistent with the results obtained by Bolívar et al. (2018), who also found no evidence to conclude that the percentage of women councillors has a significant influence on financial transparency.

Finally, our results show that those municipalities governed by a woman that also have a higher proportion on women councillors tend to disclose more information on sustainability. This finding indicates that, in line with our third hypothesis (H3), a higher presence of women in the municipal plenary will have a positive moderating effect on the influence exerted by women mayors on the municipality's engagement with and disclosure of information on the SDGs. This finding supports the homophily perspective that suggests that 'a positive interaction' occurs between women in different leadership positions. In this case, our result is consistent with that obtained by Araujo and Tejedo-Romero (2018), who found that the impact of female mayors on their council's transparency level is higher when the proportion of women councillors is higher.

Given that "the commitment to 'leave no one behind' should be seen as ideologically motivated" (Weber, 2017, p. 400), in addition to analysing how the gender of elected officials in municipalities affects the disclosure of information on the 2030 Agenda, we have also analysed the influence of the governing party's political ideology on the role played by women in relation to the municipality's commitment to the SDGs and the disclosure of information about them. We found that the government party's ideology does not affect the effect of mayor gender and gender diversity of the municipal corporation on the disclosure of information on the SDGs. This finding indicates that the influence of women's presence in local management on sustainability transparency is not affected by the political ideology of the governing party. One possible explanation for this result is that, due to its proximity to citizens' problems, political ideology may have less weight on this type of actions at the local level. Our result is in line with those obtained by Araujo and Tejedo-Romero (2018), who also found that political

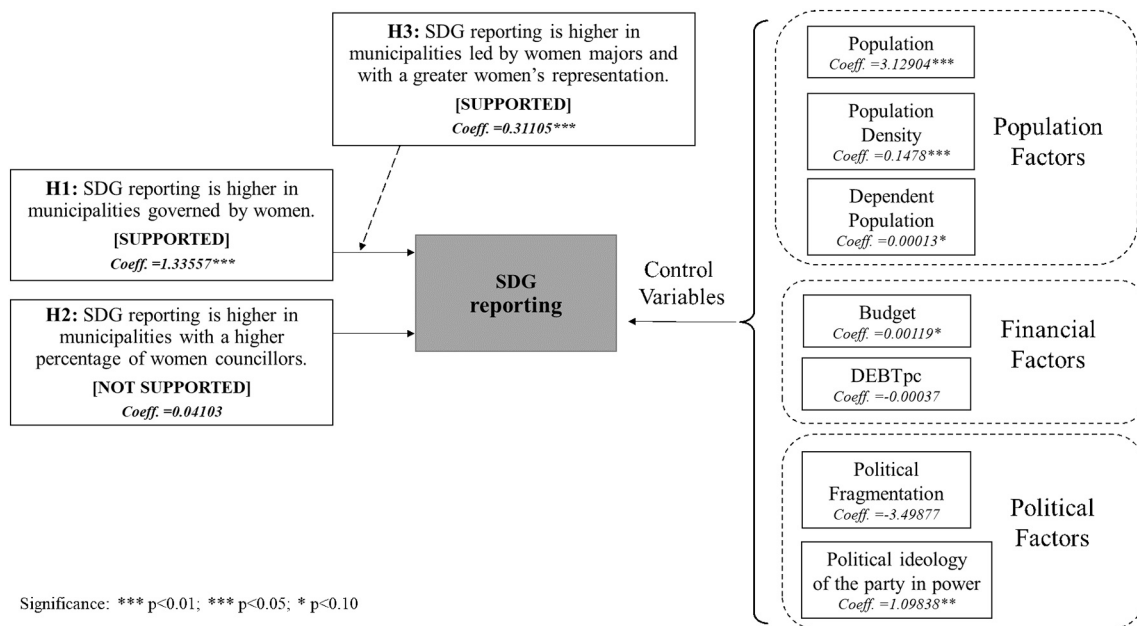


Fig. 4. Summary of findings.

ideology does not significantly affect the effect of women mayors on local transparency. However, it contradicts that obtained by Cabaleiro-Casal and Buch-Gómez (2020), who showed that political ideology moderates the effect of women's leadership (as mayors or councillors) on local government budgetary policies.

Fig. 4 summarise our main findings.

5.2. Research and policy implications

Taken together, our results contribute to the current debate on women's substantive representation in local policy by showing that they bring a 'distinct voice' to local governance fostering both sustainability and transparency. From a theoretical viewpoint, our findings support social role theory by demonstrating that female politicians behave in accordance with their gender stereotypes, fostering greater transparency with respect to the municipality's commitment to the 2030 Agenda. In relation to the role of women mayors, in line with upper echelons theory, our results show that the demographic attributes of mayors (in our case, their gender) influence the transparency of their municipalities with respect to the SDGs. Furthermore, in line with resource dependency theory, our findings indicate that women councillors bring unique skills, knowledge, and experience to their municipalities, with a positive impact on SDG engagement and reporting.

In terms of policy implications, the pressing need to contextualise the 2030 Agenda by considering the specificities of very different local situations (Klopp & Petretta, 2017; Rieiro-García et al., 2023) requires that strategies and policies be tailored to the individual circumstances of urban and rural communities. This involves both the modernisation and support of the most vulnerable urban areas and rural communities and the rethinking of megacities to make them more sustainable and inclusive. In particular, SDG 11 (sustainable cities and communities) calls for cities to become more sustainable, resilient, inclusive, and safe, and includes among its targets affordable, accessible and sustainable transport, improved resource efficiency and air quality, and climate resilience. Urban sustainability implies a balance between the protection of the environment and the development of urban areas (Ahvenniemi et al., 2017), for which social and spatial planning play a key role (Bardal et al., 2021). As noted by Klopp and Petretta (2017), the SDGs and related targets put urban planning at the forefront and raise the question of how they can be integrated into urban policy and planning in order to

optimise resources and increase their potential for impact. Embedding the SDGs in comprehensive urban planning would provide an integrated sustainability approach that would improve both citizen well-being and urban sustainability (United Nations Economic and Social Council, 2018).

From this perspective, this study shows that women politicians can play 'a catalytic role' in urban sustainability. Our results suggest that women's formal political representation endows municipalities with gender-relevant values that favour the development of this integrated sustainability approach for urban planning through increased commitment to the 2030 Agenda. According to Kawgan-Kagan (2020), 'only when gender differences are considered in planning processes, it will be possible to improve the quality of living in urban areas by reducing urban space scarcity, local and global emissions, and noise exposure'. In this study, we confirm this statement by showing that the higher stakeholder orientation that women mayors and councillors bring to local management favours urban sustainability.

For citizens and other urban stakeholders, SDG information can enhance understanding of their city's challenges regarding sustainable development and urban sustainability and how local governments are addressing them. In this sense, by showing that women mayors and councillors lead to greater disclosure, our findings demonstrate that gender diversity in local governments is beneficial to society, providing valuable reasons to promote women's participation in politics at both local and national levels. In this way, our findings reveal a self-reinforcing loop between SDG 5 and the empowerment of women in the political sphere.

5.3. Limitations

It should be noted that this research is subject to some limitations, mainly related to the focus on a single country (Spain) and the small size of the sample (102 municipalities), slightly lower than Araujo and Tejedó-Romero (2018), which may have influenced the results and limited their generalisability.

6. Conclusions

Because of their closer proximity to citizens and their responsibility for the provision of public services related to the achievement of the

SDGs, local governments are particularly relevant for the achievement of the 2030 Agenda. Considering that a municipality's decision to commit to the 2030 Agenda and to disclose information on the SDGs can be explained as a result of the values and motivations of its key decision-makers (Marcuccio & Steccolini, 2005) and that within the scope of the 2030 Agenda 'the participation of women leaders could allow for an expansive interpretation of sustainable development' and, therefore, favour the achievement of the SDGs (Barrios et al., 2020), the aim of this study was to analyse the influence of the gender of elected officials in local councils on the degree of information about the initiatives developed to achieve the 2030 Agenda disclosed by Spanish local governments.

From the content analysis of the information regarding the SDGs disseminated on local councils' websites, it has been observed that SDG reporting is greater in local councils governed by women, while the gender diversity of the council's plenary has a positive but not significant effect. These effects hold irrespective of the political ideology of the governing party. Furthermore, it was observed that the tendency to disclose information on the SDGs is higher in municipalities governed by a woman with a higher degree of diversity in the plenary.

This study contributes to the increasing research on the effects of gender diversity on local governments' management by addressing two topics (the role of municipalities in achieving the 2030 Agenda and SDG reporting) that have not been analysed together before. Thus, we respond to recent calls from Shinbrot et al. (2019) to enhance understanding of the role of women in leadership positions in advancing towards the 2030 Agenda by providing empirical evidence regarding the local public sector. Specifically, the findings support the positive effect of women's participation in public leadership positions (mayors and councillors) on SDG commitment and reporting. Accordingly, we show that women and diversity lead to higher disclosure.

We also contribute to the literature by proposing a new way of measuring the contribution to the 2030 Agenda, specifically adapted to the role of local entities in this regard, evaluating the extent to which municipalities carry out and disclose information regarding to the achievement of the SDGs through an index calculated from the sum of 60 items of initiatives linked to the SDGs. This method could be applied to other countries and adapted to higher levels of government. On a practical level, our findings stress the importance of promoting gender diversity for the achievement of the 2030 Agenda and provide an important reason to foster women's participation in politics.

Future studies could extend the scope to other countries and broaden

the sample by including a higher number of municipalities. In addition, the analysis could be extended by considering the profiles of women mayors and councillors (age, educational background, etc.) as well as additional control variables.

Funding

Xunta de Galicia [Grant/Award Number: 2020 GPC GI-2016].

CRediT authorship contribution statement

The whole article is the result of a joint project and shared effort. The three authors have read and agreed to the manuscript.

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Declaration of competing interest

The authors report there are no competing interests to declare.

Data availability

Data will be made available on request.

Acknowledgments

We would like to express our sincere thanks to the anonymous reviewers and the editor, whose valuable suggestions and feedback throughout the review rounds helped us to make this document much stronger. We are indebted to them. Any errors are still ours.

Annex. The SDG disclosure index

SDG	Item description
SDG 1	The city council publishes the dining room grants for children living in families at risk of social exclusion.
SDG 1	Activities are carried out to collect food and clothes for people at risk of social exclusion.
SDG 1	AROE indicator data published
SDG 2	The municipality publishes data on the under-age population suffering from childhood obesity, updated at the end of the year.
SDG 2	Workshops, talks and training with experts on how to eat healthier and more sustainable food.
SDG 2	Local subsidies and grants are administered to entrepreneurs in agricultural activities.
SDG 2	The rate of underweight children at birth in the municipality is published.
SDG 2	The percentage of the population employed in agricultural activities compared to the rest of the sectors of the municipality is published.
SDG 2	The percentage or area devoted to agricultural uses in the municipality is published.
SDG 2	Campaigns are carried out to support the consumption of local and km 0 products.
SDG 2	Awareness-raising campaigns against childhood obesity are carried out through content and activities
SDG 3	Sports activities are developed for the population.
SDG 3	Activities on mental and emotional health are carried out.
SDG 3	Activities to prevent digital addictions are promoted.
SDG 3	Initiatives are promoted and awareness-raising activities are carried out to eradicate/reduce drug and alcohol consumption in the population.
SDG 3	City council death toll published
SDG 3	The number of deaths due to non-communicable diseases (cardiovascular or brain diseases) is published.
SDG 3	City council suicide death toll published
SDG 3	Life expectancy at birth is published.
SDG 3	Infant mortality rate (under 1 year) is published.

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SDG	Item description
SDG 3	Talks, workshops and activities are held to raise awareness about sexuality in order to prevent the transmission of diseases such as HIV and AIDS.
SDG 4	Digital skills training is provided for the general population.
SDG 4	Training in foreign languages (at least English) is provided.
SDG 4	Training courses, talks and workshops are given to people over 65 years of age.
SDG 4	The degree of coverage of the needs of the elderly is published (ratio of available places in residential homes and day centres/persons over 64 years of age).
SDG 4	The illiteracy rate of the municipality is published.
SDG 4	Statistics on the use of municipal libraries are published.
SDG 4	Campaigns are carried out to promote the use of public libraries and reading among the population.
SDG 5	The municipality has an updated and valid equality plan (as a company).
SDG 5	The municipality has an up-to-date equality plan in place (as a municipality).
SDG 5	By 2021, gender equality activities have been implemented. At least 10 activities in the last year to meet the indicator.
SDG 5	The number of reports of gender-based violence is published.
SDG 5	The percentage of protection orders adopted for victims of gender-based violence is published.
SDG 6	The report on water management in the municipality is published (litres saved, consumption, litres recycled...).
SDG 6	Annual water management plan published
SDG 6	Information on annual water quality inadequacies due to unjustified cause is published (on an annual basis).
SDG 6	Campaigns are conducted to raise awareness among the population about responsible water use.
SDG 6	Studies are carried out in relation to the presence of diseases and viruses in the wastewater of the municipality.
SDG 7	The municipality has an energy efficiency plan in place.
SDG 7	The municipality makes public the origin of the energy consumed by the municipality, both in municipal buildings and in public lighting.
SDG 7	Subsidies and aid for the energy transition are managed in neighbourhood communities, homes and companies.
SDG 7	Talks and workshops for the transition of the population to renewable energy sources are given.
SDG 7	Workshops, courses and talks are given on energy efficiency and energy saving in households.
SDG 7	Municipal energy production (production in CHP plants - self-consumption of photovoltaic installations - etc.) is published.
SDG 8	The city council manages the application for grants and subsidies for the creation of new companies.
SDG 8	The city council offers entrepreneurs advice and help with the formalities and management of the company in the first years of its life cycle.
SDG 8	Talks and training activities for the employment of the over 50s are given, and there are at least 5 activities per year.
SDG 8	Talks and training activities for the employment of people under 30 years of age are given, and there are at least 5 activities per year.
SDG 8	Job search and entrepreneurship programmes and courses for the unemployed and entrepreneurs.
SDG 11	Noise levels in the municipality are published.
SDG 11	Campaigns are carried out to promote the use of sustainable transport (bus, walking, taxi, electric scooter, bicycle...).
SDG 13,15	The municipality has an updated forest fire prevention plan, at least up to 2020.
SDG 13,15	Activities to clean up green areas/beaches/etc. are developed. With the aim of raising awareness among the population about caring for nature and recycling.
SDG 13,15	Activities with environmental commitments (planting a tree, etc.) are carried out.
SDG 13,15	The average amount of waste generated per inhabitant is published.
SDG 13,15	Household recycling promotion campaigns are carried out.
SDG 17	The municipality prepares and disseminates an annual CSR report.
SDG 17	The city council publishes the detailed list of payments to suppliers and creditors and outstanding invoices.
SDG 17	The municipality publishes the details of the financing, as well as the amounts repaid (at least source of financing and lender).
SDG 17	GDP per capita data released

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ARTICLE 3. THE 2030 AGENDA IN LOCAL ENTITIES: DOES THE GOVERNMENT'S IDEOLOGICAL COLOR MATTER?

a.- **Complete reference:** Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?. *Politics & Policy*, 51(5), 800-829. Publisher: WILEY. ISSN: 1747-1346. DOI: 10.1111/polp.12553

b.- **Quality indexes:** The journal in which this article is published corresponds to level 3 (quartile Q3 of the ESCI of Web of Science). In this case this journal is indexed in the ESCI in the category of Political Science. It has an impact factor of 1.3 in the 2022 ranking (latest available year), and it is placed in the third quartile in the category Political Science (position 170/315).

The journal is also indexed in Scopus: CiteScore 1.8 (year 2022, latest available year). In this case, the journal is indexed in the categories Social Science-Political Science and International Relations (position 222/652), and Social Sciences-Sociology and Political Science (position 533/1415).

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d.- **Author's contribution:** In this article, the author of the Thesis has participated in the conceptualization of the subject of study, the election of the methodology, the data extraction, the empirical analysis, the writing, the project administration, and the incorporation of the changes suggested in the review process. The author of the Thesis contributed significantly to sections 1, 2, 3, 4 and 5 of this article.

e.- **The specific chapter of the Thesis in which the contents of the publication are reproduced:** This article is partially reproduced in the Introduction, Objectives and hypotheses, Methodology, Discussion and Conclusions.

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The 2030 Agenda in Spanish local entities: Does the government's ideological color matter?

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Funding information

Xunta de Galicia, Grant/Award Number: 2020 GPC GI-2016

Abstract

This article examines the influence of the political ideology of the governing party on the commitment of the city council to the Sustainable Development Goals (SDGs) and the disclosure of information in this regard. The effect of the level of political fragmentation in the city council is also analyzed. The results obtained through the content analysis of the information related to the 2030 Agenda disclosed on the websites of 102 municipalities during the period 2016–2021 reveal a significant influence of the ideological orientation of the ruling party, with a higher level of disclosure of SDG information in those municipalities governed by left-wing parties. Furthermore, political fragmentation limits the ability of left-wing governments to promote the SDGs as part of their political agenda. The findings reinforce the discussion on the influence of government ideology on public policy and enhance the understanding of the determinants of the contribution of public entities to sustainable development.

KEYWORDS

2030 Agenda, disclosure, Europe, local governments, local politics and policy, political fragmentation, political ideology, SDGs, Spain, sustainability reporting, sustainable development

Related Articles

Benveniste, Joseph, and Shlomo Mizrahi. 2023. “Accountability, Governance, and Institutional Change in Intergovernmental Relations: A Theoretical Framework.” *Politics & Policy* 51(2): 242–55. <https://doi.org/10.1111/polp.12520>.

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The concept of sustainability linked to economic development was first mentioned in the Brundtland Report, in 1987. Since then, economic actors have adopted various measures and commitments to achieve the global sustainability of the planet (De Iorio et al., 2022). The major milestone to date has been the adoption of the 2030 Agenda for Sustainable Development by the 193 member states of the United Nations in September 2015 (Schramade, 2017; United Nations General Assembly, 2015). The 2030 Agenda was established through an extensive negotiation process in which a wide range of actors from around the world actively participated (Caiado et al., 2018). It establishes a broad set of aspirational development goals, summarized in 17 Sustainable Development Goals (SDGs) and 169 actionable targets that address a wide range of issues relevant to sustainable development, such as poverty reduction, environmental protection, social equity, health, and education (Verboven & Vanherck, 2016).

To the extent that public awareness and media coverage of sustainability-related issues have spread significantly (Fleig & Tosun, 2017), these issues have experienced a "rise to political prominence" (Mazlum, 2004, p. 629). Governments, at all levels, are key actors in the design and implementation of policies and actions to fulfill the commitments of the 2030 Agenda (Martínez-Córdoba et al., 2020). They play a dual role: first, as policy makers, by developing public policies to protect the environment, promote economic growth, and improve the well-being of society; and second, as a model for other economic actors and social agents, implementing actions to reduce the negative impacts on the environment caused by their activities and promote social equity (Acuto et al., 2023; Grover et al., 2018; Škare & Golja, 2014). In particular, due to their proximity to citizens, local governments are called to play a significant role, directly or indirectly influencing the achievement of the SDGs (Bick & Keele, 2022; Martínez-Córdoba et al., 2020; Masuda et al., 2021).

However, there are "competing views" on sustainable development and how to address it (Söderbaum, 2017, p. 36), resulting in substantial variation in the importance of sustainable development issues on the political agenda (Spoon et al., 2014). Therefore, the extent to which and how sustainable development issues are integrated into public policy and public management depends on the ideology of the government (Aidt et al., 2018; Bick & Keele, 2022). Although it can be argued that political ideology may have less weight in this type of action at the local level due to its proximity to citizens' problems, it is no less true that current politics is highly polarized (Steiner, 2018). In general, a dichotomy between left wing and right wing is proposed and it is traditionally assumed that left-wing governments have a greater predisposition toward sustainability, social policies, and the welfare state than right-wing governments (Aguilera et al., 2021; Spoon et al., 2014; Ya Ni & Bretschneider, 2007).

Nevertheless, to the extent that the SDGs are fully accepted by different actors and constitute "a global imperative" (Tsalis et al., 2020, p. 1618), and citizens perceive sustainable development as a critical issue (Leiserowitz et al., 2005), right-wing governments cannot ignore them (Fleig & Tosun, 2017). Therefore, to understand how local governments conceive sustainable development, it seems interesting to examine whether differences in the governments' worldview and the values associated with their political ideology affect their commitment to



the SDGs or, on the contrary, the involvement in the 2030 Agenda transcends the political ideology of the governments.

Thus, in response to the calls by Aidt and others (2018) and Bick and Keele (2022) to deepen the current understanding of the determinants of the contribution of public entities to sustainable development, this article aims to analyze the influence of the political ideology of the governing party on the commitment of the city council to the SDGs and the disclosure of information about them. We also analyze the effect of the level of political fragmentation in the city council. To ensure the homogeneity of results, the study focuses on a single country (García-Sánchez et al., 2013). For this purpose, Spain was chosen because of its strong public commitment to the 2030 Agenda, for placing it at the center of the national government's management plans (Boto-Álvarez & García-Fernández, 2020), and because of the strong political polarization existing in Spain, although we are aware that this choice may affect the generalizability of the findings.

The results obtained through the content analysis of the information related to the 2030 Agenda disclosed on the websites of 102 municipalities over the period 2016–2021 (a balanced data panel of 612 observations) reveal a significant influence of the ideological orientation of the ruling party, with a higher level of disclosure of SDG information in those municipalities governed by left-wing parties. Furthermore, political fragmentation limits the ability of left-wing governments to promote the SDGs as part of their political agenda. Thus, those municipalities governed by left-wing parties and with low political fragmentation show lower levels of SDG disclosure.

The rest of the article is structured as follows: we next present the theoretical framework from which the research hypotheses are developed. We then describe the characteristics of the empirical study (sample, method, model, and variables) before presenting and discussing the main results of the study, along with those of some complementary analyses. Finally, we draw the conclusions and the implications of the results, including the limitations of the study and some future research avenues.

THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESES

According to the institutional theory, organizations (public and private) are pressured to adopt behaviors and values that are compatible with those considered desirable or appropriate in the institutional environment in which they operate “enforcing a formal coherence on the human activity” (Scapens, 1994, p. 306). These values represent “shared rules” that constitute a framework of common meanings accepted by the members of that institutional environment and are transmitted through routines and norms that regulate or prescribe accepted behaviors. Thus, social expectations about how organizations should behave assume the status of norms (Covaleski & Dirsmith, 1988). According to Scott (1994), there are three dimensions associated with the concept of institution: regulatory (institutions “regulate” behavior), normative (institutions act as “rules” that prescribe expected or socially acceptable behaviors), and cognitive (institutions represent a “framework of common meanings”).

From this perspective, the process through which the values associated with the concept of sustainable development are defined and established constitutes a process of institutionalization (Tolbert & Zucker, 1996). As a result, sustainable development is considered “a key concept of our time” (McAllister, 2012, p. 32) and public and private organizations are compelled to address the associated environmental and social challenges. Hence, the disclosure of sustainability information can be seen as an organizational response to the need to answer the demands for a greater commitment to sustainable development emanating from the institutional environment.



In this regard, some studies have analyzed the implementation of the 2030 Agenda at the local level from the perspective of institutional theory. For example, Göpfert and others (2019) examined the role played by municipal advisory committees in climate change-related decision making, in German cities, and Annesi and others (2021), through a case study based on a medium-sized Italian municipality (Lucca), examined the effect of external pressures from the Fridays For Future movement on the integration of climate change mitigation measures into local policies.

On the other hand, “the commitment to ‘leave no one behind’ should be seen as ideologically motivated” (Weber, 2017, p. 400). Given that, as noted by Annesi and others (2021), municipalities are complex systems characterized by a strong interplay between their various constituents, the political ideology of the ruling party is an influential factor that significantly determines the political agenda and decision making of local governments (Aguilera et al., 2021; García-Sánchez et al., 2013; Potrafke, 2010; Rodríguez Bolívar et al., 2018). In this sense, the political ideology of the ruling party is presumed to drive the local government's approach toward sustainability (Aidt et al., 2018; García-Sánchez et al., 2013).

Political ideology refers to “an interrelated set of attitudes, behaviours and values about the goals of society and how they should be achieved” (Tedin, 1987, p. 65), that define the ideals of the rulers (Tetlock, 1983) and the city model they propose (Prado-Lorenzo et al., 2012). Citizens resort to these “ideological labels” to form an opinion about political parties (Spoon et al., 2014). According to Duran and others (2017), political ideology influences a party's attitude toward economic and socio-cultural issues. As mentioned above, the ideology of political parties is divided into two broad categories: left wing and right wing, with the traditional assumption that right-wing parties tend to focus on economic issues, while left-wing parties place more emphasis on sociocultural issues (Aguilera et al., 2021; Aidt et al., 2018; Cuadrado-Ballesteros et al., 2014). Thus, left-wing parties have a greater inclination toward sustainability, social policies, and the welfare state than right-wing parties (Aguilera et al., 2021; Spoon et al., 2014; Ya Ni & Bretschneider, 2007), which prefer actions of a more economic nature and prioritize efficiency criteria in management (Aidt et al., 2018; Martínez-Córdoba et al., 2020).

In this regard, according to data published by the League of Conservation Voters (LCV), since the 1990s, there has been a gap between the two main political parties in the United States (Democrats and Republicans) when it comes to voting regarding environmental provisions, which has increased exponentially over time, something that can be largely attributed to ideological issues. At the local level, Cuadrado-Ballesteros and García-Sánchez (2018) found that local governments tend to behave according to their ideology (left/right) when media pressure is high, as is the case with environmental and social issues (Fleig & Tosun, 2017). Therefore, it is suggested that the political ideology of the ruling party will influence the city council's commitment to the SDGs and the disclosure of information about them.

Furthermore, according to the theory of issue ownership (Petrocik, 1996), political parties tend to emphasize those issues that they “own,” as they are related to their ideological position (Spoon et al., 2014). In this sense, left-wing parties traditionally consider themselves as “owners” of the issues related to sustainable development. Consequently, although, aware of the relevance of addressing sustainability issues, right-wing parties may broaden their political agenda to include these concerns (Fleig & Tosun, 2017; Prado-Lorenzo et al., 2012), it may be difficult to change public's perception in this regard (Spoon et al., 2014).

Additionally, previous studies (Cuadrado-Ballesteros et al., 2014; García-Sánchez et al., 2013; García-Sánchez & Prado-Lorenzo, 2008; Guillamón et al., 2011; Ríos et al., 2013; Steurer et al., 2010) have observed that left-wing governments have a greater predisposition for transparency in terms of sustainability information and disclose more information on social issues than right-wing parties. Therefore, the following hypothesis is proposed:



Hypothesis 1. Municipalities in which the ruling party has a left-wing ideology are more likely to engage with the 2030 Agenda and disclosure information on their contribution to the SDGs.

The ability of the ruling party to pursue its political agenda is constrained by the degree of political fragmentation existing in the city council (Aguilera et al., 2021; Lazzarini & Musacchio, 2018). As a consequence of the rise of populist or “challenger” parties on both the right and the left of the spectrum of political ideologies and the subsequent decline in the vote share of “mainstream” parties, there is a widespread trend toward greater political fragmentation (Adam et al., 2022; Carozzi et al., 2022), associated with an increase in the number of parties with parliamentary representation (Hübscher et al., 2023). Political fragmentation complicates the formation of governments leading to government coalitions of parties with diverse interests and minority governments, making it difficult to reach consensus (Adam et al., 2022; Cuadrado-Ballesteros & García-Sánchez, 2018) and having a negative effect on the stability of governments (Carozzi et al., 2022).

Political constraints increase as the number of political parties increases (Aguilera et al., 2021). According to Tsebelis (1995), each political party represented in the plenary could be considered a “veto-player” whose agreement is necessary to adopt a decision, so the higher the political fragmentation of the city council, the higher the level of political constraint. Consequently, it will be more difficult for the party in government to impose its criteria, since it will have to reach consensus on decisions and gather the demands of other groups in public policies (Adam et al., 2022; Borge et al., 2008; Martínez-Córdoba et al., 2020; Rodríguez Bolívar et al., 2018). Moreover, a higher level of political fragmentation makes it difficult for the ruling party to set challenging goals (Rodríguez Bolívar et al., 2018).

On the other hand, as several authors point out (see e.g., Adam et al., 2022; Gaia & Jones, 2020), political fragmentation increases the level of political competition and, consequently, political parties feel more pressure to fulfill campaign promises and voters' demands as well as to disclose more information (Laswad et al., 2005; Tavares & da Cruz, 2020). In this sense, previous studies (Alt et al., 2006; Harrison & Sayogo, 2014; Ríos et al., 2013) showed a positive association between transparency and political competition. With these premises, we propose the following hypotheses to contrast the influence of political fragmentation on the performance of municipalities in relation to the 2030 Agenda and the disclosure of information on the SDGs:

Hypothesis 2. Municipalities where there is a higher level of political fragmentation are more likely to disclosure information on their contribution to the SDGs.

Figure 1 summarizes the research model.

METHODOLOGY

Sample

This study focuses on large Spanish cities based on their population size (Araujo & Tejedero-Romero, 2016; Martínez-Córdoba et al., 2020; Navarro-Galera et al., 2018). This criterion was chosen because municipalities with larger populations are more likely to elaborate and disclose environmental, social, and economic information, because of their greater scope and resources (Bearfield & Bowman, 2017; García-Sánchez et al., 2013). Following Rodríguez Bolívar and others (2014, 2021), we selected the larger cities in the country, according to the provisions of Article 121 of Law 57/2003, which defines large municipalities as those with a population of

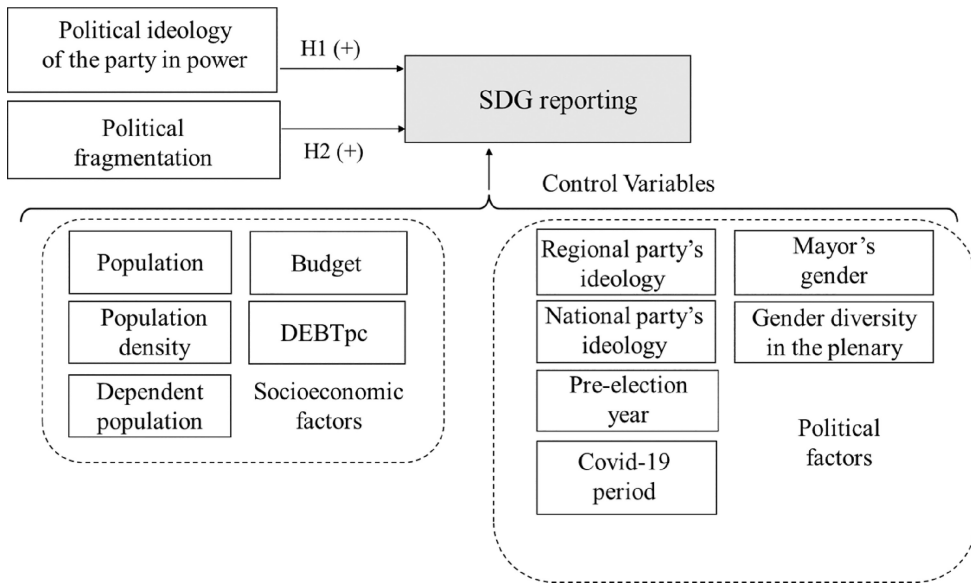


FIGURE 1 Research model.

more than 75,000 inhabitants and with special circumstances in economic, social, historical, or cultural terms.

Within the Spanish public sector, there are three levels of government: state government, regional governments (17 regional governments divided into 50 provinces and 2 autonomous cities), and local governments (8131 municipalities). Table 1 shows the number of municipalities selected for this analysis, their distribution among the different regions and autonomous cities, as well as their average population for the period analyzed.

As for the political parties that govern in the municipalities included in the sample, there is a wide range of political parties belonging to the two major political blocs: right-wing or conservative and left-wing or progressive. Thus, among the parties included in the right-wing bloc are the Popular Party (PP), Ciudadanos (Cs), and VOX, whereas the left-wing bloc is made up by the Spanish Socialist Party (PSOE), Unidas Podemos (UP), and Izquierda Unida (IU) as well as several regional parties, such as Partido Regionalista de Cantabria (PRC), Convergencia i Unió (CIU), and Partido Nacionalista Vasco (PNV), among others (Simón, 2020). Appendix 2 shows the names of the main political parties governing the municipalities included in our study.

Institutional setting

Although from 1975 to 2015 local politics in Spain was dominated by two major national parties—PP (center right) and PSOE (center left)—with some regional parties playing a leading role in their area of influence (Carozzi et al., 2022), as a result of the arrival of new political parties (mainly Cs, UP, and VOX), “in the space of three years, from 2016 to 2019, striking and unprecedented changes took place in the Spanish political landscape” (Simón, 2020, p. 3), with many municipalities with minority or coalition governments.

In Spain, local elections take place on the same day in all municipalities. The mayor is appointed by the councilors and requires a majority. In case that the winning party in the elections has not obtained an absolute majority, a negotiation process takes place for a mayor to

TABLE 1 Sample municipality distribution by regions.

Region	LGs (<i>n</i>)	Population average by LGs (<i>i</i>)	Population average by region (<i>ii</i>)	<i>i/ii</i> (%)
Andalucía	21	3,770,920.50	8,417,232.17	44.80
Aragón	1	670,850.17	1,316,830.67	50.94
Asturias	3	569,874.83	1,026,531.33	55.51
Canarias	5	924,639.17	2,140,002.50	43.21
Cantabria	1	172,464.33	581,870.00	29.64
Castilla y León	5	822,167.17	2,410,014.83	34.11
Castilla-La Mancha	5	501,530.17	2,037,927.17	24.61
Cataluña	16	3,684,856.50	7,649,591.50	48.17
Ceuta	1	84,519.67	84,519.67	100.00
C. Valenciana	8	1,847,460.67	4,997,406.67	36.97
Extremadura	2	246,485.50	1,071,959.83	22.99
Galicia	6	922,911.33	2,704,261.67	34.13
Islas Baleares	1	412,853.33	1,141,023.00	36.18
La Rioja	1	151,232.83	317,226.33	47.67
Madrid	16	5,274,163.67	6,624,465.33	79.62
Melilla	1	86,392.33	86,392.33	100.00
Murcia	3	759,642.83	1,489,544.00	51.00
Navarra	1	200,088.67	651,397.17	30.72
País Vasco	5	962,354.67	2,204,175.50	43.66
Total	102	22,065,408.33	46,952,371.67	47.00

be elected by a majority with the support of other parties. Otherwise, the party with the most votes appoints the mayor, who governs in minority. In this sense, Carozzi and others (2022) found that municipalities with a higher level of political fragmentation are less likely to have a single-party majority. Councilors from the same party tend to vote in blocks, so that negotiations and alliances take place between parties rather than with councilors.

Model

The model represented by Equation (1) was developed to estimate the effects of the political ideology of the ruling party and the political fragmentation of the plenary on the city council's commitment to the SDGs and the disclosure of SDG information.

$$\begin{aligned}
 SDGRI_{i,t} = & \beta_0 + \beta_1 * MIDEO_{i,t} + \beta_2 * HHI_{i,t} + \beta_3 * IDNEQ_{i,t} + \beta_4 * IDREQ_{i,t} \\
 & + \beta_5 * PREEL_{i,t} + \beta_6 * PCOVID_{i,t} + \beta_7 * MGEN_{i,t} + \beta_8 * WCOUN_{i,t} \\
 & + \beta_9 * DEBTPC_{i,t} + \beta_{10} * BUDGET_{i,t} + \beta_{11} * PDEP_{i,t} + \beta_{12} * PDEN_{i,t} + \beta_{13} * LNPOPU_{i,t} + \mu_i + \varepsilon_{i,t}
 \end{aligned}
 \tag{1}$$

where *i* and *t* represent the city council and the year, respectively; μ is the unobservable heterogeneity; and ε is the linear estimation disturbance or residual. Furthermore, the numerical variable Year was included to control the time effect. Because of the censored nature of the dependent variable, the analysis is performed using Tobit regression for panel data.

Method

This study focuses on data corresponding to the period 2016–2021, which spans from the entry into force of the 2030 Agenda until the last year for which data is available. The information needed to perform the analysis was obtained from the websites of the city councils through content analysis, a method widely used in social research (Alcaraz-Quiles et al., 2015; Dade & Hassenzahl, 2013; García-Sánchez et al., 2013).

Each coauthor of this study conducted the data extraction process individually. Subsequently, the data were compared, discussed, and differences were harmonized. To avoid biases, a procedure was defined to extract the data, which consists of the following steps, summarized in Figure 2:

1. Each author analyzes the home webpage of the city council and consults each specific area looking for the information of the item to be validated.

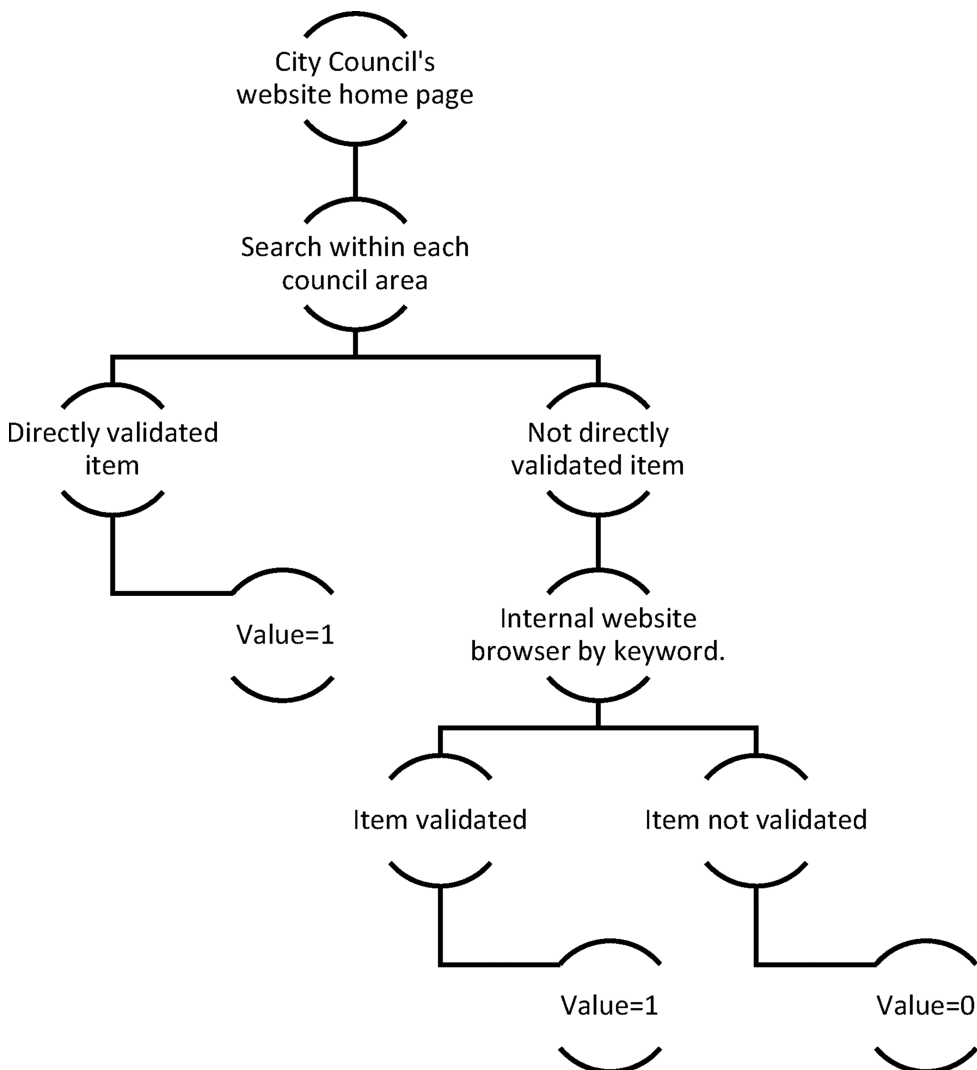


FIGURE 2 Data collection methodology.

2. If the item can be validated without using the website search engine, a value of 1 will be assigned for the years that can be validated, and 0 otherwise.
3. If the item cannot be found directly, the internal search engine is used by searching for keywords previously agreed by the authors. If the search results provide information on the item to be validated, a value of 1 will be assigned in the corresponding years, and 0 otherwise.

VARIABLES

Dependent variable: Level of SDG reporting

We measure the commitment of municipalities to the SDGs through the level of information on the SDGs disclosed by the municipality. To assess this, we developed an index called the Sustainable Development Goals Reporting Index (SDGRI), which is based on 60 items. A similar approach has been used in previous studies, such as Sol (2013), Alcaide Muñoz and others (2017), and Izzo and others (2020), among others.

Thus, following previous studies (e.g., Martínez-Córdoba et al., 2020), a script was developed based on the list of the 17 SDGs and their corresponding 169 targets, from which we selected the 60 most relevant items for municipalities which fall under the direct competence of municipalities and may therefore be affected by local governance (Annesi et al., 2021). These items were organized according to the specific SDG to which each item was most related (Appendix 1). Considering that, due to the geographical diversity of the Spanish territory (inland and coastal regions), municipalities face different challenges in relation to SDG13, SDG14, and SDG15 depending on their geographical location, the items related to these three SDGs were grouped together (SDG13-15) to favor the homogeneity of the analysis. Furthermore, given that SDG9, SDG10, SDG12, and SDG16 do not fall under the direct responsibility of municipalities due to their broad scope, but of higher levels of government (Annesi et al., 2021), namely regional governments, and also to avoid duplication, because some of their related targets are already included in other SDGs (e.g., SDG11 and SDG17), these four SDGs were not considered separately in the SDGRI index.

As mentioned above, for each municipality and each year, a value of 1 was assigned if information was provided on the item, and a value of 0 otherwise. Then, the results were averaged according to the following formula:

$$SDGRI_{i,t} = \left(\frac{\sum_{n=60}^{j=1} Item}{60} \right) * 100.$$

Independent and control variables

The independent variables of the model represented in Equation (1) refer to the political ideology of the governing party of the city council and the level of political fragmentation of the city council plenary. Political ideology (MIDEO) is a dummy variable that takes the value of 1 if the governing party is left oriented (i.e., communist, socialist, social democratic, and other left-wing political parties), and 0 if the governing party is right oriented (i.e., conservative, centrist, Christian democratic, and other right-wing political parties). As for political fragmentation (HHI), following previous studies (Alcaide Muñoz et al., 2022; Guillamón et al., 2011; Navarro et al., 2010), the Herfindahl-Hirschman Index is used.

In line with other studies (see e.g., García-Sánchez et al., 2013; Martínez-Córdoba et al., 2020; Navarro-Galera et al., 2018) to avoid biased results, the model includes a set of control variables representing political-institutional, organizational, and socioeconomic

factors that condition local government activity. As for the political-institutional factors, two additional variables were included that represent the political ideology of the governing parties of the remaining levels of government (national [IDEON] and regional [IDEOR]). Both the regional and national government influence and guide local government decision making, so an ideological alignment could favor the ruling party of the city council to implement its political agenda (Araujo & Tejedo-Romero, 2018; Bastida et al., 2009; Rodríguez Bolívar et al., 2018). In addition, through the pre-election variable (PREEL), we measure the effect of proximity to municipal elections because the election calendar may induce opportunistic behavior by the ruling parties (Aidt et al., 2018) and that transparency in municipalities tends to be higher during the year previous to elections (Tejedo-Romero & Araujo, 2020).

In terms of organizational factors, the gender of the mayor (MGEN) and gender diversity in the municipal plenary (WCOUN) were considered. Both factors have a direct impact on the decisions of the city council and, specifically, on the type of sustainable decisions and actions performed. Previous studies show that women's participation in the public sphere favors the development of social policies and the promotion of the welfare state (Balaguer-Coll & Ivanova-Toneva, 2021; Funk & Philips, 2019), as women tend to be more empathetic, more sensitive to the environment, and have a greater aversion to inequalities (Rodríguez Bolívar et al., 2018). Furthermore, several studies show a positive influence of women leaders on the information transparency of public entities (Araujo & Tejedo-Romero, 2018; Herrero-Gutiérrez et al., 2021).

As socio-economic variables, the annual budget (BUDGET) and debt per capita (DEBTPC) were included, due to their strong influence on municipal management and the development of sustainable actions and policies (Chen & Han, 2019; García-Sánchez et al., 2013). In addition, three variables representing population factors were included: the percentage of dependent population (PDEP), the total population of the municipality (LN-POPU), and the population density (PDEN). Previous studies have documented a positive relation between these variables and the sustainable performance of municipalities (Alcaraz-Quiles et al., 2015, 2017; Ariza Marín et al., 2021; Garas et al., 2016; Homsy & Warner, 2015; Navarro-Galera et al., 2018).

Finally, considering that in 2020 there was a radical change in the management models of municipalities as a consequence of the COVID-19 pandemic (Martínez-Córdoba et al., 2021), which forced them to redesign the way they provide services to citizens and formulate policies to cope with the new conditions (Padeiro et al., 2021) as well as to increase transparency (Hartanto & Siregar, 2021), the variable PCOVID was included to measure the impact that this period had on the local governments' management with respect to the 2030 Agenda and the disclosure of information in this regard.

Table 2 describes the independent and control variables used in this study, including other studies that have used them.

RESULTS AND DISCUSSION

Descriptive statistics and correlations

Table 3 summarizes the descriptive statistics for the variables included in the analysis. It can be observed that, in the period studied, most local governments have a left-wing political ideology (.6732) and present a high level of political fragmentation, as indicated by the low index of political party concentration (.1542). Furthermore, it can be observed that there is ideological coincidence between the party governing the municipality and that of the regional and national governments for approximately half of the municipalities included in the sample. The

TABLE 2 Independent variables and control variables for hypothesis testing.

Variable	Acronym	Definition	Measurement	Previous studies
<i>Independent variables</i>				
Political ideology of the governing party	MIDEO	Ideology of the mayor	0 = Right; 1 = Left	Grimmelikhuijsen and Welch (2012), Tavares and da Cruz (2020), Gaia and Jones (2020), Benito et al. (2021), Giacomini et al. (2021), Alcaide Muñoz et al. (2022)
Political fragmentation of the city council	HH	Herfindahl-Hirschman Index as an indicator of political fragmentation	$HHI = (\text{Governing party councilors})^2 / (\text{Total councilors in plenary session})^2$	Guillamón et al. (2011), Tavares and da Cruz (2020), Ríos et al. (2018), Gaia and Jones (2020), Alcaide Muñoz et al. (2022)
<i>Control variables</i>				
National ideology	IDNEQ	Local government's ideology coincides with state government	0 = No-ideological coincidence; 1 = Ideological coincidence	Araujo and Tejedro-Romero (2018), Rodríguez Bolívar et al. (2018)
Regional ideology	IDREQ	Local government's ideology coincides with regional government	0 = No-ideological coincidence; 1 = Ideological coincidence	Araujo and Tejedro-Romero (2018), Rodríguez Bolívar et al. (2018)
Preelection year	PREEL	The year studied is prior to a municipal election year	0 = No year prior to municipal elections; 1 = Year prior to municipal elections.	Ríos et al. (2018), Tejedro-Romero and Araujo (2020)
COVID-19 periods	PCOVID	The year under study is affected by the COVID-19 pandemic	0 = Years before 2020; 1 = Years 2020 and later.	Padeira et al. (2021)
Gender of councilor	MGEN	Gender of mayor	0 = Male; 1 = Female	Guillamón et al. (2011), Araujo and Tejedro-Romero (2016)
Gender diversity of the city council	WCOUN	Percentage of women councilors in the plenary	(Women councilors/Total councilors) * 100	Rodríguez Bolívar et al. (2018)
Level of debt	DEBTpc	Debt at the end of the year	Debt/Total population	Benito et al. (2021)
Budget	BUDGET	Approved annual expenditure budget	Millions of euros	Tirado-Valencia et al. (2016)
Population	LNPOPU	Population resident in the municipality	Logarithm of the population	Tavares and da Cruz (2020), Ríos et al. (2018), Puroñ-Cid and Rodríguez Bolívar (2018), Gaia and Jones (2020)
Dependent population	PDEP	Percentage of population dependent on the municipality	Population under 15 and over 65/Population aged 16–64 years	Navarro-Galera et al. (2019)
Population density	PDEN	Population density of the municipality, in number of inhabitants per km ² of municipal area	Number of inhabitants/municipal extension (km ²)	Cabaleiro-Casal and Buch-Gómez (2020)

number of female mayors is very low (27.5%), and female councilors account for 45.64% of the total number of councilors.

It can also be seen in Table 3 that the disclosure of information related to the 2030 Agenda (SDGDI) has an average of 36.62%, a value that ranges between 10% and 82%. Figure 3 shows the annual evolution of the values obtained for the dependent variable, observing an increasing trend in the value of the index. This level of disclosure is higher than that obtained by Gaia and Jones (2020), who found that the level of transparency of English local councils in relation to biodiversity information was 15.87% and that 49% of them did not disclose biodiversity-related information. However, in their study of 106 large cities from ten European countries,

TABLE 3 Descriptive statistics.

Variables	Mean	Std. dev.	Min	Max
SDGRI	36.6666	11.0154	10.0000	81.6666
MIDEO	.6732	.4694	.0000	1.0000
HHI	.1542	.0926	.0093	.5486
IDEON	.6667	.4717	.0000	1.0000
IDEOR	.5539	.4794	.0000	1.0000
PREEL	.1666	.3729	.0000	1.0000
PCOVID	.3333	.4717	.0000	1.0000
MGEN	.2745	.4466	.0000	1.0000
WCOUN	45.6407	4.9161	28.0000	66.6700
BUDGET	259.4561	571.4493	51.6637	5416.9280
DEBTPC	554.6808	696.8143	.0000	4266.5360
PDEP	52.8529	5.4485	36.0000	67.0000
PDEN	2989.7500	3540.7460	40.0000	19,808.000
LNPOPU	11.91835	.6844	11.1980	15.0199

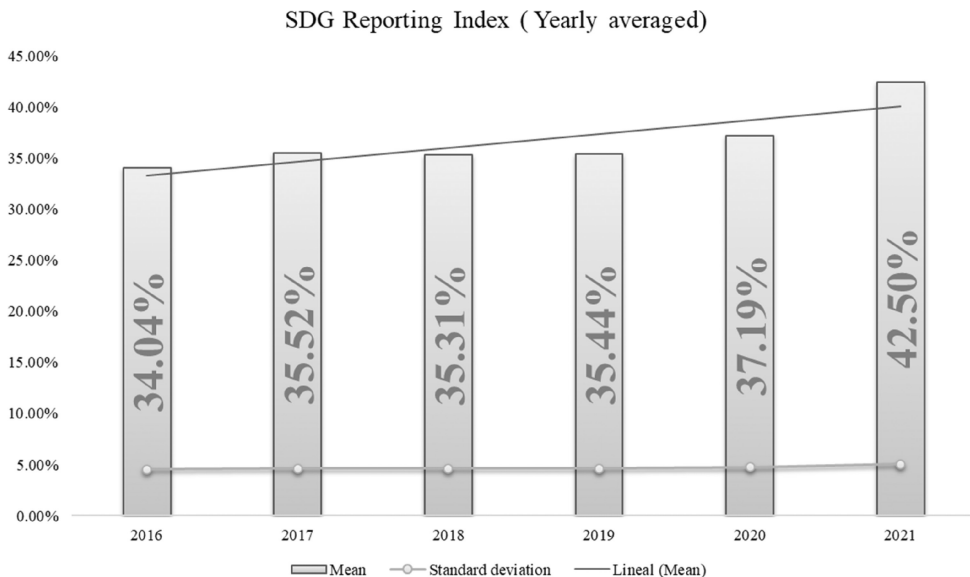


FIGURE 3 SDG reporting index temporal tendency.



Alcaraz-Quiles and others (2020) found a higher overall level of sustainability information disclosure in all countries: Denmark (44.4%), Finland (49.43%), Ireland (70.33%), Italy (56.73%), Netherlands (48.43%), Norway (58.8%), Portugal (42.92%), Spain (48.32%), Sweden (38.3%), and the UK (57.96%).

Table 4 shows the correlation between the variables included in the model. As can be seen, there are no significant multicollinearity problems between the variables.

Main results

Table 5 shows estimation results of Equation (1). Regarding the political ideology of the municipality's governing party, a significant positive effect is observed (coeff. = .0145492), with a confidence level of 90%, which allows us to accept Hypothesis 1. Therefore, it can be affirmed that city councils led by left-wing parties are more likely to implement actions related to the achievement of the SDGs and to disclose information in about them than city councils led by right-wing parties. This finding supports the idea that left-wing parties traditionally consider themselves "owners" of issues related to sustainable development (Spoon et al., 2014) and their "ideological closeness" to these issues favors the city council's commitment to the SDGs and the disclosure of information about them.

In this case, our result is consistent with the findings obtained by Guillamón and others (2011), Sol (2013), and Garrido-Rodríguez and others (2019), who observed that left-wing ruling parties promote transparency in Spanish municipalities, as well as with the results obtained by Ríos and others (2013) and Citro and others (2021) for a pool of more than 90 countries. Moreover, our result is in line with those obtained by Grimmekhuijsen and Welch (2012) and Kraah and Mertens (2020), who found that Dutch municipalities and Ghanaian municipalities governed by left-wing parties were more transparent than those governed by right-wing parties. As regards sustainability, our result is consistent with those obtained by Spoon and others (2014), who found that left-wing parties promote the inclusion of green issues in the political agendas of Western European countries, and by García-Sánchez and Prado-Lorenzo (2008), who showed that the fact that the local government was governed by a party with a right-wing ideology negatively affected the level of implementation of Local Agenda 21.

However, our results contrast with those obtained by Aidt and others (2018), who, in the case of national governments, documented a negative effect of left-wing governments on genuine wealth per capita, as an indicator of progress toward sustainable development; Giacomini and others (2021), who found that political ideology makes no difference in environmental transparency in Italian local governments; and Ribeiro and others (2017) and Tavares and da Cruz (2020), who found that the political ideology of the governing party of municipality does not affect transparency in Portuguese local governments.

Regarding political constraints, the results show that the level of political fragmentation in a municipality does not affect the municipality's commitment to the SDGs or the disclosure of information on this regard (coeff = -.0211371). Therefore, we cannot accept Hypothesis 2. In our case, the existence of a high number of political parties represented in the city council plenary does not seem to influence the political agenda of the governing party regarding the SDGs or the disclosure of information on the city council's contribution to the 2030 Agenda. This result coincides with those obtained by Guillamón and others (2011), García-Sánchez and others (2013), Tejedo-Romero and Araujo (2020), and Alcaide Muñoz and others (2022), for Spanish municipalities, and by Gaia and Jones (2020), for English local councils, who also found no evidence of a significant effect of greater political fragmentation on local government transparency. However, our result differs from the results of Navarro and others (2010), who observed that a greater political fragmentation leads governing parties to disclose more information on sustainability in the Spanish local context, and Tavares and da Cruz (2020), who found that higher levels



TABLE 4 Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 SDGRI	1.0000													
2 MIDEO	.1366***	1.0000												
3 HHI	-.0981**	-.1888***	1.0000											
4 IDEON	.1212***	.0246	.0908**	1.0000										
5 IDEOR	.2942***	.1316***	-.0900**	-.0907**	1.0000									
6 PREEL	-.0551	-.0062	-.0574	.3162***	.0572***	1.0000								
7 PCOVID	.2042***	.0197	.0908	.5000***	-.0907	-.3162***	1.0000							
8 MGEN	.1403***	.1710***	-.0069	.0155	.1543***	-.0098	.0155	1.0000						
9 WCOUN	.0503	.0287	-.0060	.1124***	.0706*	-.0755*	.1147	.1793***	1.0000					
10 BUDGET	.3797***	.0015	-.1352***	.0159	-.0333	-.0082*	-.0984**	.0711*	.0455	1.0000				
11 DEBTPC	-.0607	.0205	-.0096	-.0917**	-.0455	-.0727*	.0190	-.0249	-.0016	-.0433	1.0000			
12 PDEP	.2074***	-.0476	-.0400	.1076***	.0615	.0113	.0688*	.1061***	-.0446	.0361	.0489	1.0000		
13 PDEN	.2416***	.1770***	.1322***	.0057	.1350***	-.0017	.0059	.2136***	.0607	.2632***	-.0018	.2177***	1.0000	
14 LNPOPU	.4406***	.0573	-.1461***	.0089	-.0011	-.0028	.0097	-.0342	-.0962**	.7291***	-.0271	.1172***	.2652***	1.0000

Note: Significance: *** $p < .01$; ** $p < .05$; * $p < .10$.



TABLE 5 Main results.

Variable	Coeff. (Std. dev.)
MIDEO	.0145492* (.0079688)
HHI	-.0211371 (.433525)
IDEON	.0098079 (.0197719)
IDEOR	.0636446*** (.0073149)
PREEL	-.0081091 (.0228025)
PCOVID	.042342** (.0196863)
MGEN	.0145181* (.0083612)
WCOUN	.0003931 (.0007471)
DEBTPC	-.0000040 (.0000051)
BUDGET	.0000256*** (.0000092)
PDEP	.0024481*** (.0006789)
PDEN	.0000010 (.0000011)
LNPOPU	.0508038*** (.0078086)
Constant	-.458806*** (.1067421)
Year controlled	
Rho =	.0242739
Log likelihood =	628.13574
p-Value =	.0000

Note: Significance: *** $p < .01$; ** $p < .05$; * $p < .10$.

of competition, measured as the margin of victory, increased the information transparency in Portuguese municipalities, although minority executives did not affect transparency. Likewise, Navarro-Galera and others (2018), in their analysis of 91 municipalities from nine European countries, found that in the case of Southern countries (i.e., Spain and Portugal) the fact that local governments were governed by parties with absolute majority favors transparency.

With respect to the control variables, the level of SDG disclosure is higher in municipalities with a female mayor and in those located in regions where a left-wing party governs. In addition, larger municipalities, with higher budgetary levels, are more likely to disclose more SDG information. There is also a strong impact of the COVID-19 pandemic on SDG disclosure, whereby the level of SDG information disclosed by municipalities was higher in the years affected by the COVID-19 pandemic (i.e., 2020 and 2021).

Complementary analysis

According to Ames and Keck (1997, p. 2), the adoption of sustainability policies has been “polycentric,” with interactions at the national and subnational levels. Therefore, an ideological alignment between the ruling party of a city council and those of the regional government and the state government could favor the ruling party of the city council to implement its political agenda, while the fact that the regional government and/or the state government are led by a party of opposite ideology could negatively influence the ability of the municipality's ruling party to implement its political agenda (Araujo & Tejedro-Romero, 2018; Bastida et al., 2009; Rodríguez Bolívar et al., 2018). Consequently, the political ideology of the party leading the regional government and/or the national government may moderate the influence of the ideology of the party governing the municipality on its commitment to the 2030 Agenda and the disclosure of information on the SDGs.

On the other hand, although in our case the level of political fragmentation in a municipality does not affect the municipality's commitment to the SDGs and the disclosure of information in this regard, it has been shown that political fragmentation of the city council limits the ability of the ruling party to pursue its ideological agenda (Aguilera et al., 2021). Thus, to contrast the possible existence of these moderating effects, Equation (2) is proposed. This equation is a variant of Equation (1) that incorporates the interaction of the variables IDEON*MIDEO, IDEOR*MIDEO, and MIDEO*HHI.

$$\begin{aligned}
 \text{SDGRI}_{i,t} = & \beta_0 + \beta_1 * \text{MIDEO}_{i,t} + \beta_2 * \text{HHI}_{i,t} + \beta_3 * \text{MIDEO}_{i,t} * \text{HHI}_{i,t} + \beta_4 * \text{IDNEQ}_{i,t} \\
 & + \beta_5 * \text{IDNEQ}_{i,t} * \text{MIDEO}_{i,t} + \beta_6 * \text{IDREQ}_{i,t} + \beta_7 * \text{IDREQ}_{i,t} * \text{MIDEO}_{i,t} + \beta_8 * \text{PREEL}_{i,t} \\
 & + \beta_9 * \text{PCOVID}_{i,t} + \beta_{10} * \text{MGEN}_{i,t} + \beta_{11} * \text{WCOUN}_{i,t} + \beta_{12} * \text{DEBT}pC_{i,t} + \beta_{13} * \text{BUDGET}_{i,t} \\
 & + \beta_{14} * \text{PDEP}_{i,t} + \beta_{15} * \text{PDEN}_{i,t} + \beta_{16} * \text{LNPOPU}_{i,t} + \mu i + \varepsilon_{i,t}
 \end{aligned} \tag{2}$$

Table 6 shows the results of the estimation of Equation (2). First, we again observe a significant effect of the political ideology of the ruling party of the city council on SDG reporting (coeff. = .0537946), at a 95% confidence level, but no evidence is found that political fragmentation has a significant effect on SDG reporting (coeff. = .1056318). However, even though this second variable (HHI), individually, does not have a significant effect on the disclosure of information, it does have a significant negative moderating effect on the influence of the political ideology of the governing party on the municipality commitment to the 2030 Agenda and the disclosure of information on the SDGs (coeff. = −.1889865), at a confidence level of 95%. Thus, those city councils governed by left-wing parties and with low political fragmentation show a lower level of SDG disclosure. Therefore, it can be said that political fragmentation limits the ability of left-wing governments to promote the SDGs as part of their political agenda. In this case, our findings are in line with the results obtained by Aguilera and others (2021), who also document a negative moderating effect of political fragmentation on the influence of political ideology.

As noted by Simón (2020), fragmentation and electoral volatility increase ideological differentiation giving rise to polarization. According to the study on affective polarization conducted by Gidron and others (2019) with data from 20 countries (including the United States, the UK, Germany, Greece, France, and Portugal) between 1996 and 2015, Spain is one of the most polarized countries, a situation that has been accentuated in recent years with the emergence of new political parties (Miller, 2020), which has led parties to try to maximize the differences with their rivals to avoid losing votes, so that they are far apart in their ideological positions. Thus, there are currently two large antagonistic blocs on the Spanish political scene: Cs-PP-VOX on the right and UP-PSOE and most regionalist

TABLE 6 Complementary results.

Variable	Coeff. (Std. dev.)
MIDEO	.0537946** (.0215966)
HHI	.1056318 (.068665)
MIDEO*HHI	-.1889865** (.0836385)
IDEON	.0170355 (.0223475)
IDEON*MIDEO	-.0060955 (.0159182)
IDEOR	.069295*** (.0123757)
IDEOR*MIDEO	-.007421 (.0152869)
PREEL	-.0114834 (.0228147)
PCOVID	.0424643** (.0196495)
MGEN	.0139041* (.0083456)
WCOUN	.0004995 (.000746)
DEBTPC	-.0000034 (.0000051)
BUDGET	.0000259*** (.0000092)
PDEP	.0025555*** (.0006789)
PDEN	.0000010 (.0000011)
LNPOPU	.0510089*** (.0077982)
Constant	-.5015704*** (.1082463)
Year controlled	
Rho = .0244373	
Log likelihood = 630.77637	
p-Value = .0000	

Note: Significance: *** $p < .01$; ** $p < .05$; * $p < .10$.

parties on the left (Simón, 2020). This polarizing attitude prevents the achievement of major state agreements as the opposing party's policies and initiatives are perceived negatively by the opposite ideological bloc. At the local level, fragmentation tends to be greater, with many cases of minority or coalition governments (Simón, 2020). According to Carozzi and others (2022), in the period 1975–2014, there were 1,055 successful no-confidence votes in Spanish municipalities that involved a change of the ruling party. This figure has increased markedly in the last 20 years, with cases of municipalities (e.g., Badalona) that have had four mayors in the last four years.

According to Miller (2020), polarization in Spain mainly affects identity issues (ideological or territorial) rather than specific public policies, such as public services. Among the issues that foster ideological polarization are environmental issues. Thus, left-wing parties exhibit a strong critical awareness of climate change, whereas the denial of the existence of climate change is often linked to conservative ideologies, particularly in the case of those parties leaning toward extreme positions on the left–right political spectrum. As a result, initiatives linked to environmental and social issues (e.g., immigration) are likely to be highly controversial, making it difficult to advance discussions on specific policies, spending, or investment decisions (Miller, 2020). Moreover, in this context, a high degree of political fragmentation may cause governments to adopt certain policies or renounce others for “fear of playing into the hands” of their political rivals in the city council (Kanbur & Myles, 1992), which would explain the moderating effect of political fragmentation on the influence of left-wing political ideology on SDG disclosure by Spanish municipalities.

The political ideology of the party that led the regional government has a significant impact on SDG disclosure (coeff. = .069295), at a confidence level of 99%, but no significant effect of political ideology of the party that led the national government party ideology was found (coeff. = .0170355). These results may be due to the fact that in Spain the competencies related to many of the items considered in the analysis are assigned to the regions which are responsible for their management. Furthermore, no evidence was found of a significant moderating effect of the ideological alignment between the ruling party of a city council and those of the regional government and the state government on the ability of the former to implement its political agenda regarding the 2030 Agenda and the disclosure of information on the SDGs. This finding could be explained by the higher level of political fragmentation at the local level in Spain. Indeed, as Boto-Álvarez and García-Fernández (2020) noted, although Spain is committed to the 2030 Agenda at the highest level and the Spanish government approved an action plan for the implementation of the 2030 Agenda in 2018, political fragmentation and political instability at all levels of government have hindered effective support for its implementation.

Again, a significant effect of the COVID-19 pandemic on SDG disclosure was found (coeff. = .0424643) at a confidence level of 95%, indicating that the level of disclosure of SDG information by city councils was higher in the years marked by the COVID-19 pandemic (2020 and 2021). Likewise, SDG disclosure is higher in large municipalities (coeff. = .0510089), where the mayor is female (coeff. = .0139041), and where the percentage of dependent population is higher (coeff. = .002555), as well as in those with a larger budget (coeff. = .0000259).

Post hoc analysis

To confirm the robustness of the obtained results on the main model, three variations of Equation (1) are proposed, subdividing the dependent variable (SDGRI) into three variables, according to the ESG classification criteria: environmental (SDGRI_E), social (SDGRI_S), and governance (SDGRI_G). From there, Equations (3)–(5) are proposed, with the same independent and control variables included in Equation (1).

$$\begin{aligned}
 \text{SDGRI}_{E_{i,t}} = & \beta_0 + \beta_1 * \text{MIDEO}_{i,t} + \beta_2 * \text{HHI}_{i,t} + \beta_3 * \text{IDEON}_{i,t} + \beta_4 * \text{IDEOR}_{i,t} \\
 & + \beta_5 * \text{PREEL}_{i,t} + \beta_6 * \text{PCOVID}_{i,t} + \beta_7 * \text{MGEN}_{i,t} + \beta_8 * \text{WCOUN}_{i,t} \\
 & + \beta_9 * \text{DEBTPC}_{i,t} + \beta_{10} * \text{BUDGET}_{i,t} + \beta_{11} * \text{PDEP}_{i,t} + \beta_{12} * \text{PDEN}_{i,t} + \beta_{13} * \text{LNPOPU}_{i,t} + \mu_i + \varepsilon_{i,t}
 \end{aligned} \tag{3}$$

$$\begin{aligned}
 \text{SDGRI}_{S_{i,t}} = & \beta_0 + \beta_1 * \text{MIDEO}_{i,t} + \beta_2 * \text{HHI}_{i,t} + \beta_3 * \text{IDEON}_{i,t} + \beta_4 * \text{IDEOR}_{i,t} \\
 & + \beta_5 * \text{PREEL}_{i,t} + \beta_6 * \text{PCOVID}_{i,t} + \beta_7 * \text{MGEN}_{i,t} + \beta_8 * \text{WCOUN}_{i,t} \\
 & + \beta_9 * \text{DEBTPC}_{i,t} + \beta_{10} * \text{BUDGET}_{i,t} + \beta_{11} * \text{PDEP}_{i,t} + \beta_{12} * \text{PDEN}_{i,t} + \beta_{13} * \text{LNPOPU}_{i,t} + \mu_i + \varepsilon_{i,t}
 \end{aligned} \tag{4}$$



$$\begin{aligned}
 \text{SDGRI}_{i,t} = & \beta_0 + \beta_1 * \text{MIDEO}_{i,t} + \beta_2 * \text{HHI}_{i,t} + \beta_3 * \text{IDEON}_{i,t} + \beta_4 * \text{IDEOR}_{i,t} \\
 & + \beta_5 * \text{PREEL}_{i,t} + \beta_6 * \text{PCOVID}_{i,t} + \beta_7 * \text{MGEN}_{i,t} + \beta_8 * \text{WCOUN}_{i,t} \\
 & + \beta_9 * \text{DEBTPC}_{i,t} + \beta_{10} * \text{BUDGET}_{i,t} + \beta_{11} * \text{PDEP}_{i,t} + \beta_{12} * \text{PDEN}_{i,t} + \beta_{13} * \text{LNPOPU}_{i,t} + \mu_i + \varepsilon_{i,t}
 \end{aligned}
 \tag{5}$$

Table 7 depicts the results of the estimation the three proposed equations in comparison with the main model. Considering the independent variables of the main model, there is a positive effect of political ideology of the party governing the city council on the disclosure of social information (coeff. = .0116559) and governance information (coeff. = .0042964), at a confidence level of 95%. In terms of political competition, it only affects the disclosure of social information, which decreases when there is a greater degree of political fragmentation in the city council (coeff. = -.0553707).

As for the control variables, only the ideology of the regional government party has a significant and positive effect on the disclosure of environmental (coeff. = .0236643), social (coeff. = .0323895), and governance information (coeff. = .0076049). The political orientation of the national government or the electoral calendar cannot be shown to have a significant impact on the disclosure of environmental, social, and governance information.

The impact of the COVID-19 pandemic period (2020 and 2021) has been found to be significant (coeff. = .091056), at a 95% confidence level, indicating that the municipalities disclosed more governance information during the year affected by the COVID-19 pandemic. Municipalities governed by a female mayor tend to disclose more social (coeff. = .0097693) and environmental (coeff. = .0064717) information, with 95% and 99% confidence, respectively, while gender diversity in the plenary has no significant effect.

In addition, larger municipalities (coeff. = .0232513), with a higher percentage of dependent population (coeff. = .0027424), and population density (coeff. = .000002) tend to disclose more social information, with a confidence level of 95%. Larger municipalities also disclose more environmental (coeff. = .0174522) and governance (coeff. = .0116629) information, while municipalities with higher population density (coeff. = -.0000007) also tend to disclose more governance information. Finally, municipalities with higher budget show a tendency to disclose more social information (coeff. = .0000288), with a confidence level of 99%.

CONCLUSIONS

Municipalities play a significant role in the achievement of the SDG, as they are key actors in the provision of services and the enactment of policies linked to the 2030 Agenda (Bick & Keele, 2022; Martínez-Córdoba et al., 2020; Masuda et al., 2021). Through the disclosure of SDG information, local governments can demonstrate to citizens how they are involved in achieving the 2030 Agenda commitments and the actions that they have implemented to move toward the achievement of the SDGs.

However, the extent to which sustainable development issues are integrated into public policy is influenced by the political ideology of the government (Aidt et al., 2018; Bick & Keele, 2022). Thus, this article analyzes the influence of the political ideology of the governing party on the commitment of the city council to the SDGs and the disclosure of information about them. The results obtained for a sample of 102 municipalities with more than 75,000 inhabitants for the period 2016–2021 reveal a significant influence of the political ideology of the ruling party, with a higher level of disclosure of SDG information in those municipalities governed by left-wing parties. Furthermore, political fragmentation plays a moderating role, limiting the ability of left-wing governments to promote the SDGs as part of their political agenda. Thus, those city

TABLE 7 Post hoc analysis.

Equation	SDGRI_Equation (1) Coeff. (Std. dev.)	SDGRI_Equation (3) Coeff. (Std. dev.)	SDGRI_S Equation (4) Coeff. (Std. dev.)	SDGRI_G Equation (5) Coeff. (Std. dev.)
MIDEO	.0145492* (.0079688)	-.0013915 (.0037187)	.0116559** (.0052879)	.0042964** (.0022681)
HHI	-.0211371 (.433525)	.0213409 (.0189493)	-.0553707** (.0269456)	.0129796 (.0115574)
IDEON	.0098079 (.0197719)	.0020622 (.0059845)	.009499 (.010362)	-.0017718 (.0049665)
IDEOR	.0636446*** (.0073149)	.0236643*** (.0034135)	.0323895*** (.0048541)	.0076049*** (.002082)
PREEL	-.0081091 (.0228025)	.0027411 (.0068898)	-.0082227 (.0119414)	-.0025794 (.0057258)
PCOVID	.042342** (.0196863)	.0077003 (.0059224)	.0155768 (.01029)	.091056*** (.0049389)
MGEN	.0145181* (.0083612)	-.0017285 (.0039018)	.0097693** (.0055483)	.0064717*** (.0023798)
WCOUN	.0003931 (.0007471)	.0000749 (.0003487)	.0002979 (.0004958)	.0000202 (.0002127)
DEBTPC	-.0000040 (.0000051)	.0000006 (.000002)	-.000004 (.000003)	-.00000001 (.000001)
BUDGET	.000256*** (.0000092)	-.000006 (.000004)	.0000288** (.000006)	.0000003 (.000002)
PDEP	.0024481*** (.0006789)	-.0001438 (.0003169)	.0025796*** (.0004505)	.0000208 (.0001932)
PDEN	.0000010 (.0000011)	.0000001 (.0000005)	.000001** (.0000007)	-.0000007** (.0000003)
LNPOPU	.0508038*** (.0078086)	.0169716*** (.003644)	.0223247*** (.0051816)	.0114708*** (.0022225)
Constant	-.458806*** (.1067421)	-.1014739** (.0496468)	-.270246*** (.0706795)	-.0872347*** (.0303426)

(Continues)



TABLE 7 (Continued)

Equation	SDGRI Equation (1) Coeff. (Std. dev.)	SDGRI_E Equation (3) Coeff. (Std. dev.)	SDGRI_S Equation (4) Coeff. (Std. dev.)	SDGRI_G Equation (5) Coeff. (Std. dev.)
Year controlled				
<i>Rho</i>	.0242739	.0045212	.0111575	.0168276
<i>Log likelihood</i>	628.13574	1097.2254	859.31455	1397.9324
<i>p-Value</i>	.0000	.0000	.0000	.0000

Note: Significance: *** $p < .01$; ** $p < .05$; * $p < .10$.

councils governed by left-wing parties and with low political fragmentation show a lower level of SDG disclosure. This could be due to the fact that, given that party councilors tend to vote as a block, in municipalities with a high degree of political fragmentation, the diversity of ideologies and political polarization make it difficult to reach consensus.

This study contributes to the literature on the influence of government ideology on public policy by providing empirical evidence that the ideology of the ruling party of city councils affects their commitment to the SDGs and the disclosure of information on the actions implemented to achieve them; and showing that this influence is moderated by the level of political fragmentation existing in the city council. In this sense, we considered two factors (political ideology and political fragmentation) that have previously been shown to influence public management and decision making but had not yet been applied to sustainability disclosure under Agenda 2030. Thus, our findings contribute to the theory of issue ownership and institutional theory by demonstrating that the fact that political parties consider themselves as “owners” of the 2030 Agenda outweighs pressures from the institutional environment regarding the implementation of actions aimed at achieving the SDGs and the dissemination of information about them.

From a practical viewpoint, this study provides additional insights on how to measure the progress of local governments in achieving the 2030 Agenda, by using a reporting index based on 60 items fully related to the SDGs, which also allows us to assess how municipalities implement policies related to the 2030 Agenda.

Finally, this study is subject to two main limitations. First, the small sample (102 municipalities) may not yield conclusive results, since in municipalities with less than 75,000 inhabitants, the lack of resources may reduce the disclosure of information on the subject. Second, the fact that the study focuses on a single country (Spain), a country where politics is strongly polarized, may bias the results, and limit their generalizability. Future studies could extend the analysis to other countries, consider municipalities of less than 75,000 inhabitants, and include more information items and control variables.

ACKNOWLEDGMENTS

The authors are deeply grateful to both the anonymous reviewers and the editors at *Politics & Policy*, whose feedback and suggestions throughout the review process have helped to make this paper much stronger. We are deeply indebted to them. We still accept responsibility for any remaining mistakes.

FUNDING INFORMATION

Xunta de Galicia [Grant/Award Number: 2020 GPC GI-2016].

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How to cite this article: Rieiro-García, Manuel, Cristina Aibar-Guzmán, and Beatriz Aibar-Guzmán. 2023. “The 2030 Agenda in Spanish Local Entities: Does the Government's Ideological Color Matter?.” *Politics & Policy* 51(5): 800–829. <https://doi.org/10.1111/polp.12553>.

APPENDIX 1

SUSTAINABLE DEVELOPMENT GOALS REPORTING INDEX—SDGRI

SDG	Item description
SDG 1	The city council announces lunchroom scholarships for children living in families at risk of social exclusion
SDG 1	The city council collects food and clothing for people at risk of social exclusion
SDG 1	The city council manages grants and subsidies for agricultural entrepreneurs
SDG 2	The rate of low-birth-weight babies born in the municipality is published
SDG 2	The AROPE index results are disclosed
SDG 2	The city council reports updated year-end statistics on underage obese population
SDG 2	There are workshops, lectures, and trainings sessions with experts in healthy and sustainable eating
SDG 2	The ratio of population employed in agricultural activities compared to other sectors of the municipality is published
SDG 2	The proportion of land used for agricultural purposes in the municipality is published
SDG 2	There are campaigns to promote the consumption of km 0 and local products
SDG 2	There are campaigns to raise awareness about childhood obesity
SDG 3	Sports activities are organized for the population
SDG 3	There are activities on emotional and mental health
SDG 3	There are activities for the prevention of digital addictions in the adolescent population
SDG 3	The city council develops initiatives and awareness-raising activities to eradicate/reduce drug and alcohol consumption among the population
SDG 3	The number of deaths in the municipality is published
SDG 3	The number of deaths due to non-transmissible diseases (e.g., cardiovascular, or cerebral) is published

SDG	Item description
SDG 3	The number of deaths due to suicide in the municipality is published
SDG 3	The city council publishes the data on life expectancy at birth
SDG 3	The city council publishes the infant mortality rate (under 1 year)
SDG 3	The city council conducts talk, workshops, and activities to raise awareness about sexuality to prevent the transmission of diseases, such as HIV and AIDS
SDG 4	The city council promotes training in digital skills of the population
SDG 4	The council offers foreign language training
SDG 4	The council offers training courses, talks, and workshops for active aging
SDG 4	The city council publishes the degree of coverage of the needs of the elderly (ratio of available places in residences and day centers/people over 64 years of age)
SDG 4	The city council publishes the rate of illiterate people in the municipality
SDG 4	The city council publishes statistical data on the use of municipal libraries
SDG 4	The city council organizes campaigns to promote the use of municipal libraries
SDG 5	The city council has published a gender equality plan for its employees
SDG 5	The city council has published a gender equality plan for the population
SDG 5	The city council publishes the percentage of protection orders adopted for victims of gender violence
SDG 5	The city council publishes the number of complaints of gender violence
SDG 5	Annual gender equality activities have been carried out. At least 10 activities in the last year to meet the minimum indicator
SDG 6	The municipality promotes the use of more sustainable transport (on foot, by cab, by electric scooter, by bicycle, by bus...)
SDG 6	The municipality's noise level is made public
SDG 6	Municipal energy production (production in cogeneration plants, photovoltaic installations for self-consumption, etc.) is disclosed
SDG 6	There are workshops, training courses, and conferences on energy efficiency and household energy savings
SDG 6	Talks and workshops for the transition of the population to renewable energies are given
SDG 7	The city council manages grants and subsidies for energy transition in communities, homes, and businesses
SDG 7	The city council discloses the origin of the energy used in the municipality, both in municipal buildings and in public lighting
SDG 7	There is an energy efficiency plan in place in the municipality
SDG 7	The city council investigates the presence of diseases and viruses in the municipality's wastewater
SDG 7	The municipality organizes activities to raise public awareness of responsible water use
SDG 7	The city council releases annual data on water quality deficiencies caused by unjustified reasons
SDG 8	During the first years of the company's life, the city council helps entrepreneurs with procedures and management
SDG 8	Each year, the city council carries out at least five training activities for the employment of people over 50 years of age
SDG 8	Each year, the city council organizes at least five lectures and training activities for people under 30 years of age
SDG 8	The city council offers courses and programs for job seekers and entrepreneurs
SDG 8	Various activities are organized to raise public awareness of the importance of caring for nature and recycling



SDG	Item description
SDG 11	The city council publishes the annual water management plan
SDG 11	The city council publishes a report on water management that includes information on savings, consumption, liters recycled, etc.
SDG 13–15	The city council manages applications for subsidies for the creation of new companies
SDG 13–15	The city council has an updated fire prevention plan
SDG 13–15	Environmentally friendly activities are carried out (e.g., planting a tree)
SDG 13–15	There are campaigns to promote household recycling
SDG 13–15	The average amount of waste generated per inhabitant is published
SDG 17	The city council prepares and discloses an annual CSR report
SDG 17	The city council publishes GDP per capita data
SDG 17	The city council publishes a detailed list of payments to suppliers and creditors and outstanding invoices
SDG 17	The city council publishes the details of the financing, as well as the amounts reimbursed (at least the financing source and the lender)

APPENDIX 2

RULING PARTIES IN SPANISH MUNICIPALITIES

Right-wing or conservative	Left-wing or progressive
Ciudadanos (C's)	Bloque Nacionalista Gallego (BNG)
Partido Popular (PP)	Bloque Nacionalista Valenciano (BNV)
	Convergencia i Unió (CIU)
	Euskal Herria Bildu (eh Bildu)
	Izquierda Unida (IU)
	Partido Nacionalista Vasco (EAJ-PNV)
	Partido Socialista Obrero Español (PSOE)
	Unidas Podemos (UP)

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The concept of sustainability in economic development emerged in the Brundtland Report in 1987. In 2015, the UN's 2030 Agenda for Sustainable Development became a major global milestone. Local governments, due to their proximity to citizens, play a crucial role in achieving the Sustainable Development Goals (SDGs). However, in Spain, the disclosure of sustainability information is voluntary and influenced by socioeconomic and political factors. This study analyses data from 102 municipalities between 2016 and 2021. The results show a growing commitment to the SDGs, especially after the COVID-19 pandemic, with larger municipalities, female mayors and left-wing governments showing higher SDG disclosure. This research advances our understanding of local government sustainability efforts and their determinants.