Challenges and strategies for gender mainstreaming policy in smart city development in Indonesia

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ABSTRACT

The involvement and participation of civil society in developing smart cities is a major issue in implementing inclusive smart cities. However, gender issues are often forgotten in developing sustainable smart cities. This article examines two issues. First, the importance of gender issues integration in the development of sustainable smart cities in Indonesia. Second, the importance of gender mainstreaming policy in the development of smart cities in Indonesia. This is a desk study or literature study. Data were obtained from research results published in national and international journals. Data was obtained through accredited journal search engines, namely google scholar, SagePub and Researchgate. The research results show that development of smart city in Indonesia is not yet gender responsive, causing gender inequality gender and excluding women from development. To respond to this, thus there is a need for gender mainstreaming policies in developing smart cities through an overview of the challenges of gender mainstreaming in developing smart cities. Thus, this research recommends a gender mainstreaming strategy as a policy in developing smart cities in Indonesia. Gender mainstreaming policy in smart city development need to be to create a smart city life that is just, inclusive and involves women in development.

Keywords: Smart city; gender mainstreaming policy; gender issues; inclusive city; inclusive gender.

ABSTRAK

Keterlibatan dan partisipasi masyarakat sipil dalam pembangunan smart city menjadi isu utama dalam implementasi smart city yang inklusif. Namun, isu-isu gender seringkali luput dari perhatian dalam pembangunan smart city yang berkelanjutan. Artikel ini mengkaji tentang dua hal. Pertama, pentingnya memasukkan isu-isu gender dalam pembangunan smart city yang berkelanjutan di Indonesia. Kedua, pentingnya kebijakan pengarusutamaan gender dalam pembangunan smart city di Indonesia. Penelitian ini menggunakan metode studi literatur atau studi kepustakaan. Data diperoleh dari hasil penelitian yang dipublikasikan melalui jurnal nasional maupun internasional. Data didapatkan melalui mesin pencarian jurnal yang sudah terakreditasi, yaitu schoolar, SagePub dan Reseachgate. Hasil penelitian menunjukkan bahwa pembangunan smart city di Indonesia belum responsif gender sehingga menimbulkan ketidaksetaraan gender dan menyingkirkan perempuan dari pembangunan. Hal ini dapat menimbulkan potensi adanya ketidaksetaraan gender dalam pembangunan smart city. Untuk merespon hal tersebut maka perlu disusun kebijakan pengarusutamaan gender dalam pembangunan smart city, dengan cara mendeskripsikan tantangan pengarusutamaan gender dalam pembangunan smart city. Dengan demikian maka, penelitian ini dapat merekomendasikan strategi pengarusutamaan gender sebagai sebuah kebijakan dalam pembangunan smart city di Indonesia. Kebijakan pengarusutamaan gender dalam pembangunan smart city perlu diintegrasikan untuk menciptakan kehidupan smart city yang berkeadilan, inklusif dan melibatkan perempuaan dalam pembangunan.

Kata Kunci: Smart city; kebijakan pengarusutamaan gender; isu gender; kota inklusif; gender inklusif.

1. INTRODUCTION

Cities are structured based on a division of labor, reflecting traditional gender roles. So far, modern cities' planning and layout have been designed by and for men (King & Liu, 2020). The results of research on spatial and urban planning showed that 80% of the population in urban areas was more suitable for residence for heterosexual and non-disabled men (Coda, 2020). The planned and designed urban layout does not accommodate the needs and lives of women and other minority groups (Coda, 2020; Ghisleni, 2022; King & Liu, 2020). This happens because of women's lack of participation and representation in city-building (Hartley, 2021). Moreover, only 10% of women work in leading architectural firms and urban planning offices worldwide (King & Liu, 2020). Lately, the discussions about comfortable smart city which can improve the quality of live have been recognized as a concern of current design (Widiyastuti, Nupikso, Putra, & Intanny, 2021).

A smart city is an innovative city concept where all components, such as research centers, political actors, companies, associations, universities, and residents, collaborate to create services and policies that will improve the quality and sustainability of life through the use of information and communication technology (Nesti, 2020). With the collaboration of all parties, the smart city can overcome all the problems that exist in the city (Direktorat Jenderal Penataan Ruang Kementerian Pekerjaan Umum, 2015). Even though the smart city concept

launched has good goals, its implementation sharpens inequality or gaps (O'Dell, Newman, Huang, & Hollen, 2019). This condition occurs because of a need for more transparency, minimal community involvement, and ignoring the needs and preferences of diverse communities (O'Dell et al., 2019). This situation is inversely proportional to one of the main goals of a smart city, which is to create an inclusive city (Nesti, 2019). Therefore, creating inclusiveness in smart cities is still being debated (Granier & Kudo, 2016). One of the topics of discussion in creating an inclusive smart city is gender equality.

The issue of gender equality in smart city policy discussions is often ignored (Nesti, 2019). The communication between smart city experts and women-friendly city experts has never happened in smart city planning (Chang, Choi, An, & Chung, 2022). Women should be involved in urban design, planning, development, and urban infrastructure and services (Falu, 2018). Thus, women can enjoy a more inclusive and democratic city life. Twenty cities from twelve European member countries have implemented gender mainstreaming policies. Eight cities (Barcelona, Vienna, Bologna, Nantes, Lyon, Madrid, Gijon, and Ljubljana) support the pillars of European social rights through the political campaign Euricities, an inclusive city for all ('Gender Equality Lessons from Cities', 2022).

Indonesia has accommodated gender mainstreaming in national development as stipulated in the 2000 Presidential Instruction (Inpres) (Soleha & Afriyanni, 2021). This regulation was issued to address the problem of injustice and gender inequality in development (Nurdin, 2022). However, based on The Global Gender Gap Index 2020 report, Indonesia's gender gap index ranks 83 out of 153 countries (Wahyuni, 2019). BPS data also shows that the gender inequality index is still quite high (Tusianti, 2020). Even in 2019, the GPI level of 19 provinces in Indonesia is still below the national average GPA (Soleha & Afriyanni, 2021). These data show gaps in access, control, participation, and benefits received by men and women (Soleha & Afriyanni, 2021). This also occurs in developing smart cities in Indonesia, which still do not fully accommodate gender issues and gender mainstreaming in smart city development (Elanda, Wahyudi, & Alie, 2022).

Smart city development emphasizes community skills in information and communication technology. However, the problem is that women tend to use less information and communication technology (ICT) (Nesti, 2019), resulting in a digital gap between men and women (Rizkinaswara, 2020) and women's digital literacy levels tend to be low (Kuncorojati, 2022). To discuss, analyze and provide solutions or recommendations related to gender issues and gender mainstreaming policy in smart cities, it is necessary to conduct studies. So far, many studies on gender mainstreaming have been carried out in several regions, cities, and villages (Kusumawiranti, 2021; Soleha & Afriyanni, 2021). However, there has been no specific gender mainstreaming study on smart cities in Indonesia. Even though Indonesia is currently holding the 100 smart city movement (Devega, 2017). Gender mainstreaming in smart city development is important to create an inclusive city. Gender-inclusive urban design and planning can improve gender equality and reshape gender roles (Colson, 2022).

2. LITERATURE REVIEW

Technological developments and key spatial issues in urban areas are core components of urban spatial planning, and lately, every city is encouraged to become a

smart city or smart city (Rachmawati et al., 2021). The term smart city was introduced in the 90s (Madakam & Ramaswamy, 2013). Then the smart city concept has narrowed its meaning, becoming a green city, a knowledge city, a digital city, a low carbon city, an environmentally friendly city, and an information city (Aljowder, Ali, & Kurnia, 2019). Since then, the definition of a smart city has developed into an ideal city with a comprehensive urban system involving technological, social, environmental, and innovation aspects (Aljowder et al., 2019). Such a smart city concept applies to cities in Europe.

Cities in Europe that have become smart cities have been well-established in the fields of education, infrastructure, economy, policy, and politics (Widiyastuti et al., 2021). The background of cities in Europe applying the smart city concept is due to limited natural resources, so it is necessary to optimize renewable energy, utilize information and communication technology and create sustainable, livable cities (Giffinger & Gudrun, 2010; Lazaroiu G. & Roscia, 2012; Widiyastuti et al., 2021). This is different from the conditions in Indonesia. The development of smart cities in Indonesia begins with the trend of using technology in public services and government. This concept is better known as e-government (Widiyastuti et al., 2021).

The Indonesian government continues to encourage cities in each region to become smart cities concerning the issue of urban population growth due to high urbanization (Widiyastuti et al., 2021). Population growth in urban areas is expected to increase by 2.75% per year (the result of a temporary study on smart cities conducted by the Coordinating Ministry for Economic Affairs in 2017) (Haryanti, 2018). Data from the Central Statistics Agency also predicts that the population in urban areas will increase by 66.6% in 2035 (Haryanti, 2018). Under these conditions, the Indonesian government made a policy to create a safe, livable, and comfortable city in 2025 (Transformasi, n.d.) by making a move towards 100 smart cities starting in 2017 (Rizkinaswara, 2020) and becoming a sustainable smart city, technology-based competitiveness in 2045 (Widiyastuti et al., 2021).

Indonesia has determined a city component or indicator as a smart city. There are seven indicators in the development of smart cities in Indonesia, including smart economy, smart people, smart environment, smart mobility, smart living, smart governance, and smart infrastructure (Astutik & Gunartin, 2019; Direktorat Jenderal Penataan Ruang Kementerian Pekerjaan Umum, 2015; Elanda et al., 2022; Utomo & Hariadi, 2016). However, each city in Indonesia develops different models, concepts, and indicators according to the city's background, human resource potential, and natural wealth (Utomo & Hariadi, 2016).

In Indonesia, several smart city components still do not accommodate the SDGs components, including the issues of gender equality and inclusiveness. This is also supported by several studies conducted that the smart city framework only talks about the comfort of living and environmental issues and does not include social inclusion (DeAngelis, 2015). The development of smart cities in Indonesia still does not optimally incorporate gender equality and inclusivity (Elanda et al., 2022). The results of research on the manifestations of smart city development in Jakarta related to the SDGs show that the gender equality component is still focused on providing lactation space in public spaces. In

contrast, the inclusiveness component like the allignment of smart city to marginal communities still needs to be implemented (Wahyono, 2019). Therefore, it is important to develop a framework smart city to become a sustainable city by paying attention to social and economic justice by incorporating issues of gender and inclusivity (Simatupang, 2015).

3. METHOD

This research uses the method of literature study or library research by using data documents, magazines, historical histories, and reference books as well as research result on the problem study (T & Purwoko, 2018). Literature review in literature study research is not only the first step in compiling a research framework but as a source of research data that utilizes library sources (Ramanda, Akbar, & Wirasti, 2019). This study's data sources came from published studies/research in national and international journals. Research which is the data source in this study was obtained from the Google search engine by entering keywords. The keywords are "smart city", "gender mainstreaming and smart city", and "gender inclusive city".

The researcher also filtered the data to be used as a source of data in this study. The journal criteria included in this research data are:

1. Journal articles published in the last five years, starting in 2018-2022, in both international and national journals.
2. The journal article has compatibility with the discussion and results of the writing and is by following under the writing keywords.
2. Journals are collected through accredited journal search engines: Google Scholar, SagePub, and ReseachGate.
3. Enter keywords in the journal search engine by adding the word and. The keywords entered are by following under the title and discussion, for example, smart city and gender mainstreaming, smart city, and gender inclusive city.
4. The researcher chooses a journal article that can be accessed in full text so that the researcher can evaluate the journal article, starting from the abstract to the conclusion.

In the google scholar search engine, the researcher entered the keywords "smart city and gender mainstreaming," and there were 23,100 articles. Then the researchers sorted again based on the year of publication, so there were 9,990 articles. Furthermore, the researchers sorted based on accredited journal machines and found 78 articles. Of the 78 articles, the researcher assessed and selected 11 articles by following the discussion of this study. From the keyword "gender mainstreaming in the smart city," there is only 1 article that fits the criteria specified above. From the keywords "smart city and gender inclusive city," have been used material by following predetermined provisions. However, out of 15 existing articles, only seven have research related to this research. Of the seven articles, research was conducted in Indonesia 1, South Africa 1, Europe 1, and India 4, with one article discussing the city of Cairo, Egypt, and Quezon Philippines.

4. FINDINGS AND DISCUSSION

4.1. Gender Mainstreaming Challenges in Smart City Development

Gender mainstreaming is a policy and program used to achieve gender equality and justice and can overcome the problem of gender inequality (Wiasti, 2017). Gender mainstreaming in the context of smart city development understands and views smart city planning from the perspective of men and women because each has different experiences and needs in an urban environment (Chang et al., 2022). The development of smart cities in Indonesia has implemented different smart city concepts in each city (Elanda et al., 2022; Utomo & Hariadi, 2016). However, the concept of smart cities in Indonesia still has not implemented gender mainstreaming in smart city development (Elanda et al., 2022). Therefore, the development of smart cities in Indonesia must apply a gender mainstreaming approach to promote citizen participation by bringing the issue of equality and providing equal opportunities. It is not easy to mainstream gender in developing smart cities in Indonesia. In the following, the challenges of gender mainstreaming in developing smart cities in Indonesia will be presented.

4.1.1. There is no specific regulation on gender mainstreaming in smart city development

The Government of Indonesia has sought gender equality by issuing regulations regarding gender mainstreaming through Presidential Regulation Number 9 of 2000 (Soleh, 2017) then appeared Minister of Home Affairs Regulation Number 15 of 2008 concerning General Guidelines for Implementation of Gender Mainstreaming, which was updated in Minister of Home Affairs Regulation Number 67 of 2011 (Badan Perencanaan Pembangunan, 2021). However, in reality, the implementation of gender mainstreaming is still experiencing problems and is not optimal, thus widening gender inequality and social inequality (Hasanah & Musyafak, 2018; Kertati, 2021). Based on The Global Gender Gap Index 2020, Indonesia occupies 85th out of 153 (Erlina & Normadilla, 2020; Soleha & Afriyanni, 2021). BPS data also shows Indonesia's IKG (Gender Inequality Index) is still high (Erlina & Normadilla, 2020; Tusianti, 2020). These data show that there are still disparities between men and women accessing, benefiting, controlling, and participating in development (Dini et al., 2020; Soleha & Afriyanni, 2021).

In general, the concept and definition of a smart city in Indonesia still do not accommodate gender issues. Components of the smart city concept in Indonesia include smart living, smart environment, smart people, smart mobility, smart economy, smart infrastructure, and smart government (Astutik & Gunartin, 2019; Direktorat Jenderal Penataan Ruang Kementerian Pekerjaan Umum, 2015; Utomo & Hariadi, 2016). Cities in Indonesia that have implemented several smart city concepts have yet to explain the smart city concept in policy documents. Only the city of Magelang has explicitly explained it in the RPJM (Pratama, 2018). Thus, it is necessary to create a smart city concept in regional policy documents and include issues of gender equality and gender mainstreaming in the components of the smart city concept and regional policy documents.

4.1.2. The representation of women in designing smart cities is still low

The representation of women in local heads and legislatures in Indonesia continues to increase every period but is still relatively low (Cakra Wikara Indonesia, n.d.; Kurniawan,

2013; Women Reseach Institute, n.d.). Affirmative action in laws and regulations provides a 30% quota for women, further increasing women's involvement in politics, especially in legislative seats (Kurniawan, 2013). The following table will show the representation of women in the legislature:

Table 1
Data on the Involvement of Women and Men in the DPR and DPRD

No	Year	DPR		DPRD	
		Men	Women	Men	Women
1	1999	91,2%	8,8%	-	-
2	2004	88,18%	11, 82%	-	-
3	2009	82,14%	17,86%	73,48%	26,52%
4	2014	82,68%	17,32%	74,24%	25,76%
5	2019	79,13%	20,87%	69,12%	30,88%

Source: Central Bureau of Statistics

The data shows that women's representation increased from 1999 to 2009. In 2014, the percentage of women's representation decreased. In 2019 it increased again due to the 2016 legislation regarding affirmative action with a 30% quota for women. Women's involvement in regional head elections has also increased despite the affirmative policies' absence (Cakra Wikara Indonesia, n.d.). During the four simultaneous regional elections starting in 2015, 2017, 2018, and 2020, the average percentage of women's candidacy was 8.6%, while the average percentage of women being elected was 8.9% (Cakra Wikara Indonesia, n.d.). The data shows that there are still few female regional heads, so this is a challenge for gender mainstreaming in smart city development (Sangiuliano, n.d.). The involvement of women in politics, both as legislators and regional heads, will bring women's perspectives and interests to the development of smart cities.

4.1.3. Women's mastery of technology is still low

Smart cities rely on technological sophistication in providing services to the community, improving the quality of human life, realizing sustainable urban life, and becoming inclusive cities (Sucitawathi, Joniarta, & Dewi, 2018). However, the vision and mission of the smart city will only succeed if there is a digital divide or digital divide between men and women (Wahyuningtyas & Adi, 2016). Gender inequality exists due to women's low access to technology (Limilia & Prihandini, 2018). Based on PayScale research, female employees in each company in the IT field are a maximum of only 30%, and the higher you go (in strategic positions), the fewer women there will be (Widjajani, Rahayu, & Romas, 2013). Other data also states that internet use in Indonesia is still dominated by male users, as much as 51.43%, and women, as much as 48.57% (Limilia, 2018). The data above shows that women's mastery and use of technology in Indonesia still need to improve. This will be a challenge in mainstreaming gender in smart city development.

4.1.4. There is no gender analysis in smart city development

Gender analysis in smart city development is needed to assess whether gender discrimination and inequality occur (Nesti, 2019). This gender analysis framework will assess

needs, planning, budgeting, impact assessment, and evaluation in smart city development (Nesti, 2019). Two gender analysis studies have been carried out in the development of smart cities, namely regarding technology acceptance between men and women using TAM (Technology Acceptance Model) analysis (Lynawati & Gunawan, 2017) and UTAUT (Unified Theory of Acceptance and Use of Technology) (Gunawan & Sinaga, 2018). The two studies only focus on the acceptance and use of smart city technology (Gunawan & Sinaga, 2018; Lynawati & Gunawan, 2017). Gender analysis to make policies related to gender mainstreaming in smart city development has not yet been carried out.

4.1.5. Women's lack of fund owning

Economic factors are one of the causes of the technological gap between women and men in Indonesia. In general, women are marginalized because they do not have purchasing power and access to modern communication tools (Wahyuningtyas & Adi, 2016). Apart from the high price of the device, the high price of internet packages also makes women reluctant to use technology such as smartphones (Limilia, 2018). Therefore, the economic factor is a challenge for gender mainstreaming policy in the development of smart city in Indonesia so that women can own and use technology, which is the basis for smart city development.

4.2. Gender Mainstreaming Strategy in Smart City Development

The strategy to accelerate gender mainstreaming in Indonesia through gender-responsive planning and budgeting has not yet been implemented in smart city development. Therefore, it is important to identify barriers to gender mainstreaming. By owning paying attention to the challenges of gender mainstreaming, the next step is to formulate a strategy for gender mainstreaming in smart city development. Several strategies need to be implemented in accommodating gender mainstreaming policies in smart city development, including:

4.2.1. Integrating regulations on gender mainstreaming in smart city development

The first thing that needs to be done is to integrating gender mainstreaming policy in smart city development. The research results of smart city development reseach show that in developing smart cities, gender-responsive policies are needed, using a gender approach or a gender lens (MacAya, Dhaou, & Cunha, 2021; Sangiuliano, n.d.). Gender-blind policies and laws will ignore societal power relations (patriarchal culture) (MacAya et al., 2021). Therefore, it is important to integrating and implementing gender mainstreaming policy in the development of smart cities to create a gender-inclusive city. A gender-inclusive city is a sustainable city that can provide a sense of security and health and is easily accessible to vulnerable groups (people with disabilities, parents, women, youth representatives, residents of unequal areas, and the informal sector) (MacAya et al., 2021).

4.2.2. Increasing the role and representation of women in smart city planning

One of the obstacles or challenges to gender mainstreaming in smart city development is that women's active participation in urban planning is still low (Sangiuliano, n.d.). Women's active participation in urban planning can be done through their involvement in formulating policies, such as being legislature members. In addition, through his role as an academic and architect. Academics and architects are groups that can provide input and can influence

policies made by the government. Unfortunately, the number of female academics in Indonesia still needs to be higher than men. This can be seen by comparing the number of male and female lecturers based on the type of higher education status.
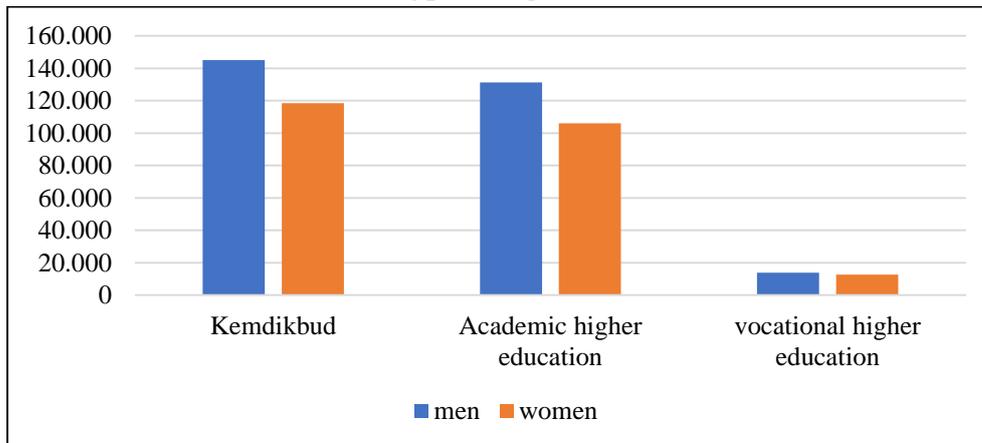

Figure 1. Comparison of the Number of Male and Female Lecturers Based on Higher Education Status (Source: Higher Education Statistics, 2020).

With fewer female academics than male academics, the possibility of female academics being involved in smart city development planning is getting smaller. On the other hand, the number of female architects in Indonesia is still small compared to men, and there is a gap in the income between male and female architects (Humas UPI, 2021). This occurs because (1) senior architects are dominated by men; (2) women tend to occupy administrative positions in the field of architecture; (3) the majority of female professional architects are still juniors (Marshall, 2019). Based on these data, it is important to increase the role and representation of women in smart city development through their roles in legislatures, academics, and architects.

4.2.3. Improving women's skills in mastering technology

Currently, technology is a tool that can empower women and can bring change to women's lives. However, women still need to catch up in mastering technology (Angraini, Nurhayati, Lukitasari, Bodromurti, & Surida, 2021). In the following, a comparison of the use of technology between men and women will be presented.
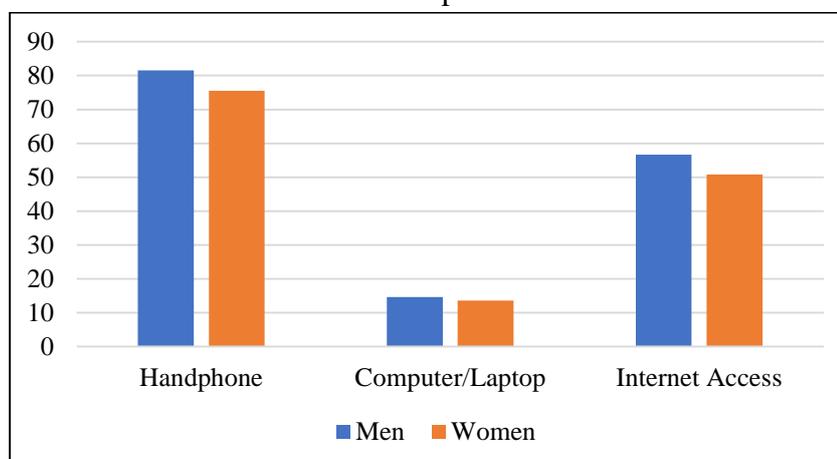

Figure 2. Comparison of Technology Use Based on Gender (Source: National Socioeconomic Survey (Susenas) 2020).

Technology is a tool that is relied upon in the development of smart cities. Women can enjoy benefits, access, participate and control the development of smart cities if women can master and use technology. Therefore, it is necessary to empower women as intelligent citizens (Sangiuliano, n.d.). Empowering women in technology can minimize the digital divide between men and women (Limilia, 2018; Limilia & Prihandini, 2018; Wahyuningtyas & Adi, 2016).

4.2.4. Involving academics in conducting gender analysis in smart city development

Gender analysis is needed in the planning stage of smart city development. Gender analysis is an important part of the smart city development stage because it can map the existing gender problems in smart city development in Indonesia. In addition, gender analysis is also used to formulate the GBS (Gender Budget Statement), which is a requirement for implementing ARG (Gender Responsive Budget) (Albarran et al., 2021). Academics are a group considered capable of conducting gender analysis objectively using methods whose data validity and reliability can be accounted for. The results of this gender analysis can be used as reference material and recommendations for making a policy. If gender analysis is not carried out, it will be challenging to implement gender mainstreaming in smart city development.

4.2.5. Declaring gender responsive planning and budgeting in smart city development

Gender-responsive budgeting is planning, programming, and budgeting activities that impact the development of gender equality and justice (Meria, Hakim, Hasnah, Nursa, & Hadi, 2022; Yeselin & Mar'iyah, 2021). Gender-responsive budget (AGR) does not intend to specialize or allocate special funds for women. This AGR is intended to analyze the different needs of men and women. The AGR system aims to accommodate these differences, including overcoming discrimination (Ulfa, Zainuddin, Khalil, Muazzinah, & Nashriyah, 2022; Yeselin & Mar'iyah, 2021). The use of technology by women is still relatively low. One of the reasons is the low economic level of women, so they cannot access technology (Angraini et al., 2021). Data on cellular phone (HP) ownership also shows that more men own cell phones than women (Angraini et al., 2021). The data will appear in the diagram below:
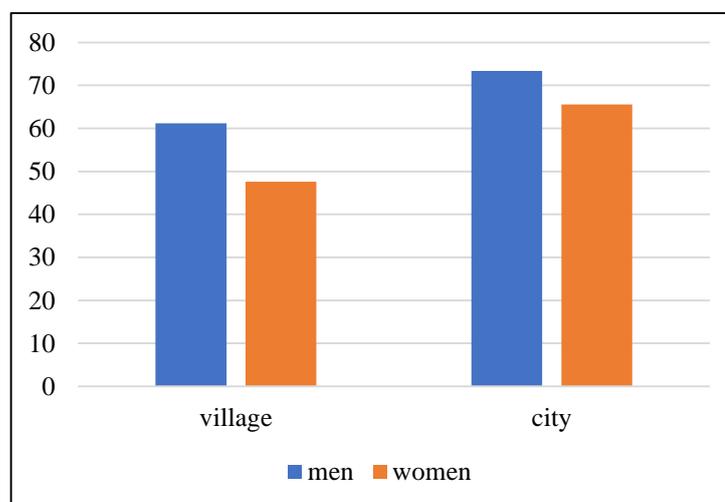

Figure 3. Cellular Phone Ownership by Region and Gender (Source: National Socioeconomic Survey (Susenas) 2020).

The data shows inequality in technology ownership in the form of cellular phones (HP). The gap in cellphone ownership in rural areas is sharper than in urban areas. Economic factors are one of the factors that influence HP ownership (Angraini et al., 2021). The poverty rate in rural areas is higher than in urban areas. Based on BPS data for 2020, the poverty rate in rural areas is 13.20%, while in urban areas, it is only 7.88% (Pryanka, 2021). HP ownership is assumed that the better the economic level, the greater the HP ownership. Therefore, the ARG approach can reduce the gap between women and men in technology ownership in developing smart cities in Indonesia.

5. CONCLUSION

A smart city is designed to solve urban problems. Smart cities are also considered to create inclusive, sustainable, safe, and live able city for all people to live in, including vulnerable groups. One of the vulnerable groups living in urban areas is women. So, to realize this inclusive city, input from women's experiences is needed. So far, smart city development ignores gender issues and has not become a component of the smart city concept in Indonesia. Gender equality and inclusive are on the SDGs agenda so that gender and inclusiveness issues should be included in the development of smart cities in Indonesia. One approach that can be taken in advocating for women and men to have equal opportunities, participate, and be involved in making decisions and evaluating the development of smart cities is through gender mainstreaming.

Gender mainstreaming should be implemented in all development and government programs, including in developing smart cities. Mapping challenges or obstacles to gender mainstreaming in smart city development must be done first so that the implementation of gender mainstreaming can run optimally. Challenges or obstacles in gender mainstreaming in smart city development include (1) the absence of regulations or rules governing gender mainstreaming specifically in smart city development; (2) women's mastery of technology is still low; (3) participation and involvement of women in designing smart cities are low; (4) women lack funds to access technology; (5) there is no gender analysis in smart city development. To overcome challenges or obstacles to gender mainstreaming in smart city development, a gender mainstreaming strategy is needed. These strategies are (1) making special regulations regarding gender mainstreaming in smart city development; (2) increasing women's skills in using technology; (3) increasing women's representation and active participation of women in smart city development; (4) planning a gender-responsive budget so that women can have access to technology and (5) conducting gender analysis in smart city development. A gender mainstreaming strategy is needed so that smart cities can become inclusive and just cities.

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