
Challenges on the Way to Implement Goals of Sustainable Development - Reducing Inequalities

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Abstract:

Purpose: The aim of this paper is to assess the differentiation of the level of socio-economic and gender inequality in European Union countries. The empirical research was based on a database of indicators of sustainable development, from which indicators describing gender inequalities were selected.

Design/Methodology/Approach: The study used a synthetic measure based on the method of zero-based unitarisation, which allowed for the classification of European Union countries according to the level of studied inequalities.

Findings: The results show that the countries that joined the Union after 2004, with the exception of Greece and Italy, had the highest level of inequality (ranking 20th or higher). In contrast, the lowest level was characteristic of Finland and Belgium, the highly developed countries of Northern and Western Europe.

Practical Implications: The research findings presented are highly relevant to developing policies to eliminate socio-economic and gender inequalities. Properly functioning social protection systems can have a stabilising effect on the economy and promote socio-economic equality.

Originality/Value: The article contributes to the most recent European and global academic discussions concerning the need to eliminate inequalities, which are among the most serious social problems in the world.

Keywords: Gender inequalities, social and economic inequalities, sustainable development, zero unitarisation method.

JEL classification: C38, I24, Q01.

Paper Type: Research study.

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1. Introduction

Sustainable development is now one of the most discussed issues, important for further developing the world's countries. The term is defined in the literature, for example, as "the ability to generate and maintain prosperity and a decent standard of living for all citizens without reducing the future ability to sustain or increase current levels of wealth" (The Global..., 2012). There are two key concepts at the root of the idea of sustainable development: basic needs (whose satisfaction for the world's poorest should be a priority) and limited opportunities (resulting from the resources available to the Earth).

In 2015, the 2030 Agenda (UN, 2015) was adopted by all member states of the United Nations, which is a roadmap consisting of 17 Sustainable Development Goals (SDGs) and 169 tasks that countries must address to move the world towards a sustainable future (Barbier and Burgess, 2019; Cuaresma *et al.*, 2018). This document defines the desired directions of changes in the long-term perspective in the following spheres: social, economic and ecological, as well as ways of achieving them. Measuring progress towards and achieving sustainable development is an integral part of the EU Sustainable Development Strategy. Each of the Agenda's tasks has indicators to measure progress in achieving them, and national governments are responsible for reporting on them.

Inequalities of both a social, economic (poverty reduction) and gender nature are among the most important problems of the contemporary world and a constant element of media and political discussions (Carlsen, 2020). Inequalities between countries and within them are visible in every aspect of sustainable development, and every Goal of the 2030 Agenda strives for their reduction. However, this is particularly evident in the targets, SDG10 (Reduce inequality within and among countries) and SDG5 (Achieve gender equality and empower all women and girls) (United Nations, 2015; 2017). They emphasise the reduction of inequalities between and within countries in many dimensions, mainly those related to income, but also age, gender, education, and economic status.

Excessive levels of inequality can threaten economic growth (Rodrik, 1999; Easterly, 2002; OECD, 2015). Indeed, this is particularly the case where deepening poverty among those on the lowest incomes is at the root of inequality. Without sufficient resources to invest in skills and education, these people may not be able to achieve their potential, which is detrimental to overall economic growth. Furthermore, high inequalities harm society in many aspects of social and economic life, not only negatively affecting economic growth. Possible adverse effects include social exclusion, missed opportunities and even a decline in health (OECD, 2015).

Preventing and reducing inequality depends largely on the actions and reforms undertaken by the Member States. The role of the EU is to support and complement

national policies on social inclusion and social protection with policy recommendations and financial support for reforms.

The aim of this paper is to assess the variation in the level of socio-economic and gender inequality in the European Union countries in 2020. Empirical research was based on a database of sustainable development indicators, from which indicators describing inequalities were selected. In the scientific literature primarily focused on measuring the implementation of sustainable development, advanced measurement methods are used, among which the dominant ones are taxonomic methods (Rizos *et al.*, 2015; Cheba, 2019; Bąk and Cheba, 2020). This approach is used in this article. A taxonomic measure based on zeroed unitisation was used to classify the EU countries by inequality.

The layout of this article includes an introduction that outlines the paper's main purpose and explains the authors' main motivations for conducting research on inequality. The next part of the paper reviews the literature on inequality in the European Union countries. Then the statistical data used in the study is presented, and the research procedure used in the paper is described. The article has been concluded by presenting research results, discussion and conclusions resulting from the study.

2. Literature Review

Due to the interdisciplinary nature of sustainable development, many definitions exist in the literature. Generally speaking, the concept refers to achieving a balance in three main dimensions simultaneously, i.e., the economic dimension, meaning the pursuit of sustainable economic development, the social dimension, meaning the protection of public health and social inclusion, and the environmental dimension, placing great emphasis on protecting the environment and natural resources in such a way as not to jeopardise the ability of future generations to meet their needs (Bluszcz and Kijewska, 2015; Kijewska, 2016; Fleurbaey, 2015; Kates *et al.*, 2005; WCED, 1987).

For more than two decades, the EU has sought to promote action among the Member States to make social protection systems more responsive to socio-economic challenges and to combat social inequality, poverty and exclusion (Bąk and Perzyńska, 2021; Cuaresma *et al.*, 2018; Panek and Zwierchowski, 2016; Nolan and Marx, 2009; Babones, 2008; Elgar and Aitken, 2011; Sanchez and Perez-Corral, 2018).

Social inequalities are inherent in the functioning of societies. They persist despite often radical changes in the political system and the implementation of anti-poverty programmes. Reducing inequalities has been one of the most important objectives of sustainable development since the beginning of the financial crisis in 2007. It involves dealing with inequalities in the distribution of opportunities and wealth

between and within countries (SDG10). However, it depends on many heterogeneous aspects, making it difficult to make a proper analysis assessing the implementation of this objective by the European Union countries (Labella *et al.*, 2020). In a market economy, income is distributed unequally and consequently, the role of states or their organisations is to distribute the income in a secondary, 'fairer' manner (Nagaj, 2013).

According to Krzyminiewska (2013), social inequalities are considered not only in the context of social justice, affecting political stability, but also have a significant impact on the development dynamics of economies. According to Gore and Figueiredo (2003), social exclusion occurs in all societies, even the rich and most developed ones.

The importance of achieving SDG10 (Reduce inequality within and among countries) is due to the fact that significant disparities negatively affect sustainable development and slow down progress toward the other Sustainable Development Goals. Moreover, many inequalities hinder social cohesion and reduce equal access to education and health services.

When discussing the topic of social inequality, one cannot ignore the aspect of gender inequality, which is included in the fifth of the 17 Sustainable Development Goals. Many researchers draw attention to the negative impact of gender and racial inequalities on economic, organisational and labour market development (Steinmetz, 2012; Sparreboom, 2014; Galpin *et al.*, 2015). According to Deloitte's 2019 calculations, improving the state of gender equality in the European Union could boost GDP per capita by between 6.1pc and 9.6pc, representing between EUR 1.95 trillion and EUR 3.15 trillion (OECD, 2019).

Kupczyk (2018) highlights the relevance of the problem of gender inequality from the point of view of both social justice and economic and human resource management aspects in organisations. As the study of Andrijevic *et al.* (2020) shows, a rapid improvement of gender inequality is possible under the sustainable development scenario already in the immediate future. The proportion of girls growing up in countries with the highest gender inequality could be reduced to about 24% in 2030, compared to about 70% today.

Poverty in terms of economic inequality is a source of debate at the academic, political and social levels. That is due to both its significant impact on the development opportunities and quality of life of individuals, as well as on overall economic, economic and social performance (Nolan and Marx, 2009). Szarfenberg (2007) notes the impact of poverty on the lives of any person affected thereby. Lack of access to certain types of goods and services results in a lower chance of surviving most of one's life in good health, physical, mental and social fitness. Basic goods such as food, water, clothing, footwear, housing, or at least safe shelter, education or access to medicine are so essential that without a minimum amount of

these, the chances of a successful life are drastically reduced, and social exclusion occurs. There are many definitions of social exclusion. Depending on adopted assumptions or an area of science, they may focus on various issues. However, they have certain central elements in common. Gore and Figueiredo (2003) refer to the most important ones:

1. Social exclusion is a negative state or process.
2. It may be treated as an objective or subjective evaluation of people's quality of living, such as a feeling of inferiority or material deprivation.
3. Social exclusion can be identified as a description of the disempowerment of an individual, expressed both by low levels of well-being and by an inability to participate in social life and work.
4. It can also be regarded as a feature of particular societies, expressed through the attitude of social groups, in which individuals or groups are denied access to rights, services, goods or resources.

Accessing new data sources and refining information on progress towards the 2030 Agenda goals so that everyone can benefit from them is a key part of its strategy. Monitoring trends in reducing inequalities and providing tools that can assess the impact of policies on the likelihood of achieving this goal are thus high on the agenda of the research community (Cuaresma *et al.*, 2018). The choice of the appropriate definition is of key importance for selecting proper indicators and the manners of their measurement. Researchers also indicate that the methods used to measure this issue significantly impact the way social policy is conducted (Rusnak, 2011; Panek and Czapiński, 2011).

In the social sphere, the Europe 2020 strategy defined inclusive growth as one of the European Union's three main priorities. One of the main goals is to reduce the number of Europeans at risk of poverty and social exclusion by 20 million by 2020. According to Eurostat, the number of such people in 2010 reached 115 million. European regional policies, which consume more than a third of the EU budget (OECD, 2007), have also focused on stimulating growth in relatively low-income areas to reduce regional disparities.

However, individual income redistribution policies remain the sole responsibility of national governments (Fredriksen, 2012). In the EU, children are at higher risk of poverty than the rest of the population. The at-risk-of-poverty-or-exclusion rate for children peaked in 2012 at - 28% and remained unchanged until 2014. In 2020, 24.2% of children (under 18) in the European Union were at risk of poverty or social exclusion, while the rate for adults was 21.7%. Significant inequalities in child poverty exist across the EU Member States: child poverty risk rates ranged from 12.1% to 41.5% in 2020 (Limani *et al.*, 2020; OECD, 2007).

Another group particularly vulnerable to poverty and social inequality because of their age is the elderly. There is a marked difference in the risk of social exclusion

between the two age groups in many countries. Thus, one group of countries has a relatively low risk of poverty among children (compared to other age groups) and a relatively high risk among the elderly. This group includes Cyprus, Denmark and Finland. The opposite is true in another group of countries, child poverty is much higher than poverty among the elderly population. This group includes the Czech Republic, Slovakia, Hungary, Luxembourg and Poland.

On the other hand, there is no clear pattern of age differentiation in the Baltic States, the Mediterranean countries and Ireland. In all those countries, the risk of poverty among children and older adults is high compared to the working-age population. In those countries, job salaries play a dominant role in household incomes, and the social security system plays a relatively limited role in reducing income inequalities (Ward *et al.*, 2009).

3. Statistical Material and the Method

The analysis presented in this paper is based on indicators from the Sustainable Development Indicators database on socio-economic inequalities and gender. The database provided by Eurostat contains 102 indicators describing 17 goals. There are 6 core indicators assigned to each goal, and the remaining 37 are applicable for monitoring more than one goal. Indicators relating to multiple areas defining gender and social inequalities are included in the goals, 5. Gender Equality and 10. Reduced Inequalities. The set of indicators selected for the study contains stimulants, i.e., such indicators, the increased values of which mean a positive result for a researched phenomenon and destimulants, the desired values of which are as low as possible.

The majority of indicators used in the research are destimulants, 6 are stimulants (X_{10S} , X_{11S} , X_{12S} , X_{13S} , X_{14S} , X_{15S}). The following indicators (diagnostic features) were taken into consideration in the research:

- X_{1D} – share of the population aged 18-24 with at most lower secondary education who were not involved in any education or training,
- X_{2D} – gender pay gap in unadjusted form; the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees,
- X_{3D} – gender employment gap (the gender employment gap is defined as the difference between the employment rates of men and women aged 20-64),
- X_{4D} – share of the inactive population due to caring responsibilities,
- X_{5D} – share of the population at risk of income poverty after social transfers,
- X_{6D} – relative median at-risk-of-poverty gap (the distance between the median equivalised total net income of persons below the at-risk-of-poverty threshold and the at-risk-of-poverty threshold itself, expressed as a percentage of the at-risk-of-poverty threshold),

X_{7D} – income distribution (It is calculated as the ratio of total income received by the 20 % of the population with the highest income (the top quintile) to that received by the 20 % of the population with the lowest income (the bottom quintile)),

X_{8D} – share of young people (aged 15 to 29) neither in employment nor in education and training,

X_{9D} – share of the population at risk of poverty or social exclusion,

X_{10S} – tertiary educational attainment; share of people aged 25 to 34 who have completed tertiary studies; female,

X_{11S} – tertiary educational attainment; share of people aged 25 to 34 who have completed tertiary studies; male,

X_{12S} – share of seats held by women in national governments,

X_{13S} – share of positions held by women in senior management positions,

X_{14S} – employment rate (the share of the population aged 20 to 64 who are employed),

X_{15S} – income share received by the bottom 40% of the population.

Most indicators are characterised by moderate to high variation (Table 1). Only for the indicator X_{14S} – employment rate (the share of the population aged 20 to 64 who are employed) the coefficient of variation is below 10%. It is worth mentioning that the majority of stimulants are characterised by left-handed asymmetry, which means that the countries with values of indicators above the average prevail. In the case of stimulants, it is a positive situation from the point of view of the studied phenomenon. Only for two stimulants the asymmetry coefficient has positive values, and these are X_{11S} (tertiary educational attainment; male), X_{12S} (share of seats held by women in national governments), with the strength of this asymmetry being negligible.

In the case of destimulants, a strong right-handed asymmetry prevails (except for the indicator X_{2D} – gender pay gap in unadjusted form; the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees), which is positive as well, because for the majority of member states unfavourable values of features from the point of view of inequalities are below the EU average.

Table 1. Selected descriptive parameters for the researched indicators

Symbol	Mean	Coefficient of variation (%)	Asymmetry
X_{1D}	8.68	38.79	0.41
X_{2D}	12.92	41.89	-0.29
X_{3D}	9.74	52.27	0.64
X_{4D}	24.27	54.90	0.68
X_{5D}	14.81	28.03	0.57
X_{6D}	22.34	24.38	0.15
X_{7D}	4.82	24.55	1.06
X_{8D}	10.94	36.52	0.56

X_{9D}	21.13	24.40	0.64
X_{10S}	49.86	19.18	-0.27
X_{11S}	35.57	23.71	0.28
X_{12S}	32.49	41.47	0.07
X_{13S}	19.93	36.17	-0.14
X_{14S}	74.29	7.06	-0.70
X_{15S}	21.61	10.41	-0.49

Source: Own elaboration.

One of the basic objectives of multivariate statistical analysis is to build a ranking of studied objects (EU countries) based on a set of characteristics describing them. When constructing a ranking based on quantitative characteristics, it is necessary to normalise them in terms of size and deprive them of denominators. Many normalisation methods of quantitative features found in the literature serve this purpose (Kukuła, 2012). According to Jarocka (2015), selecting the normalisation procedure in the ranking construction process impacts the result of evaluations obtained. While selecting the research methods, the following proposals must be considered (Kukuła, 2000):

- deprivation of the denominators in which the characteristics are expressed;
- bringing down the order of magnitude of variables to the state of comparability;
- quality of the lengths of the intervals of variation of the values of all standardised characteristics (constancy of the interval) and equality of the lower and upper limits of their intervals of variation;
- possibility of normalisation of features assuming positive and negative values or only negative ones;
- possibility of normalising features assuming values equal to zero;
- non-negativity of values of normalised features;
- existence of simple formulas unifying the nature of variables.

The zero unitarisation method meets all those proposals. It is characterised by good results regarding the degree of conformity of the classification with the relevant cluster structure (Jarocka, 2015; Korzeniewski, 2018). Since the indicators proposed in the paper are measured in different units of measurement and on different scales, therefore, in order to unify them, the method of zeroed unitisation was used, applying the following transformations:

$$\text{for the stimulant } z_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \quad \max_i x_{ij} \neq \min_i x_{ij} \quad (1)$$

$$\text{for the destimulant } z_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \quad \max_i x_{ij} \neq \min_i x_{ij} \quad (2)$$

This way of normalisation results in all the values of the normalised variables belonging to the interval $[0,1]$. The synthetic measure of development (z_i) is constructed as the arithmetic mean of normalised values of diagnostic features:

$$z_i = \frac{1}{n} \sum_{j=1}^k z_{ij}, \quad (3)$$

where: n – number of objects (states),
 k – the number of diagnostic features.

Based on the value of the synthetic measure, countries can be divided into four groups characterised by a similar level of inequality. The division was made based on the formulas:

- group 1: $z_i \geq \bar{z} + S_z$,
- group 2: $\bar{z} + S_z > z_i \geq \bar{z}$,
- group 3: $\bar{z} > z_i \geq \bar{z} - S_z$,
- group 4: $z_i < \bar{z} - S_z$.

where:

z_i – indicator value, \bar{z} – arithmetic mean of the synthetic variable z_i , S_z – standard deviation of the statistical variable z_i .

4. Study Results

Based on the values of 15 indicators (described in Section 3 Statistical material and method) characterising the level of socio-economic and gender inequality in the 27 European Union countries in 2020, a ranking of EU countries was created (Table 2). A higher level of the measure indicates a lower level of inequality. Based on the ranking, countries were divided into four typological groups (I-IV), with countries in group I having the lowest level of inequality and countries in group IV having the highest.

In 2020, the highest level of socio-economic and gender inequality was found in Romania. The decisive factors were mainly indicators: X_{6D} (relative median at-risk-of-poverty gap), X_{10S} (tertiary educational attainment), or which Romania obtained the highest and the lowest value among the EU member states. A similar high level of inequalities is observed in the Czech Republic. The country achieved the highest values for the indicators: X_{7D} (income distribution) and X_{9D} (share of the population at risk of poverty or social exclusion). Italy, Greece and Lithuania also belong to group IV.

The most numerous typological group is group II consisting of 9 countries, followed immediately by group III, comprising 8 countries. Group I, which had the lowest social and gender inequality level in 2020, consists of the three Baltic states

(consecutively Sweden, Belgium, and the Netherlands) and further Slovenia and Austria. The main influence on Sweden's first position in the ranking came from two indicators: X_{4D} (the share of an inactive population due to caring responsibilities) and X_{14S} (the employment rate), in which the country achieved the best results. In the remaining countries of Group I, the measure differed only slightly, indicating similar social and gender inequality levels. It is worth noting that both the first and the last place in the ranking are characterised by a significant difference in the values of the measure compared to the positions of neighbouring countries.

In order to show the differences in the level of the examined indicators in particular groups, average values in groups were calculated (Figures 1-4). Their detailed analysis may explain why, for example, countries that seem to have a different socio-economic situation, e.g., Finland and Bulgaria, have been placed in group two. In the case of indicators of a stimulant nature (Figures 1 and 2), one can clearly see a decrease in average values of indicators when moving to the next typological group. The opposite is true for the destimulant indicators (Figures 3 and 4), with an increase in the average value of the indicators.

Table 2. *Values of the synthetic variable, rank and typological groups of the European Union States in 2020*

Ranking position	Country	Indicator value	Group
1	Sweden	0.7625	I
2	Belgium	0.6971	
3	Netherlands	0.6939	
4	Slovenia	0.6810	
5	Austria	0.6729	
6	France	0.6699	II
7	Ireland	0.6663	
8	Finland	0.6504	
9	Slovakia	0.6207	
10	Bulgaria	0.5850	
11	Latvia	0.5847	
12	Germany	0.5782	
13	Denmark	0.5763	
14	Estonia	0.5718	III
15	Portugal	0.5573	
16	Spain	0.5404	
17	Luxembourg	0.5399	
18	Malta	0.5315	
19	Poland	0.5185	
20	Cyprus	0.5114	
21	Croatia	0.4851	
22	Hungary	0.4832	

23	Lithuania	0.4375	IV
24	Greece	0.4283	
25	Italy	0.3849	
26	Czechia	0.3693	
27	Romania	0.2832	

Source: Own elaboration.

Figure 1. The average values of the indicator X_{12S} for particular typological groups

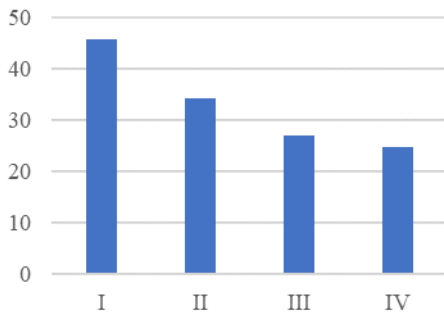


Figure 2. The average values of the indicator X_{14S} for particular typological groups

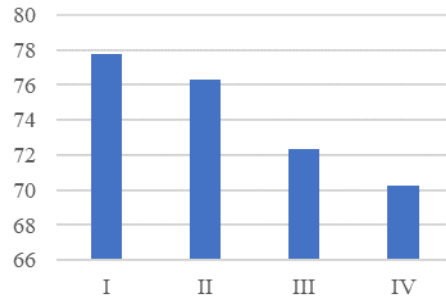


Figure 3. The average values of the indicator X_{7D} for particular typological groups

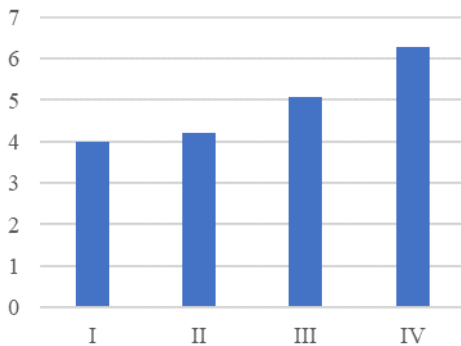
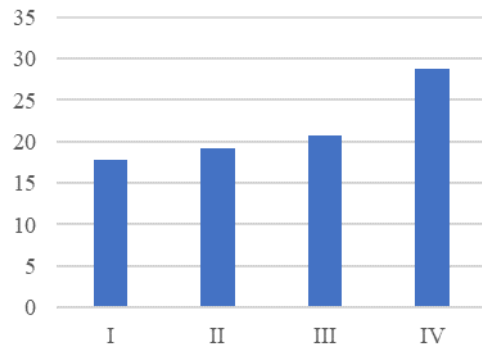


Figure 4. The average values of the indicator X_{9D} for particular typological groups



Source: Own elaboration.

5. Discussion and Conclusions

Researchers around the world conduct research on socio-economic inequality and gender inequality. A ranking of the world's countries in terms of gender inequality was provided, for example, by Carlsen (2019) based on his research. His results are similar to those obtained in this paper. The Scandinavian countries, i.e., Norway, Sweden, Denmark and Finland, as well as the Netherlands, ranked highest. Romania emerged as one of the worst EU countries in terms of inequality. An interesting situation concerns Bulgaria, which was ranked last among European countries in Carlsen's ranking, and 10th in the authors' ranking. One of the reasons for this situation is the good level of indicators describing income inequality, i.e., income distribution and income earned by the poorest 40% of the population, which were not considered in studies focusing only on gender inequality.

In a ranking examining the achievement of Goal 10 Reducing Inequalities, compiled by Labella *et al.* (2020), Sweden and Romania also ranked first and last, respectively. In contrast, in the ranking for 2019, Romania ranked penultimate, surrendering last place to Bulgaria. Sweden is in the first place as in the other rankings. It is worth noting that this is another study in which the Scandinavian countries score best and the countries of Southern and Eastern Europe perform worst.

In order to eliminate inequalities between and within the EU Member States, many challenges remain. The efficient fight against inequality problems is important for implementing sustainable development goals and the future of the European Union. While well-functioning social protection systems can stabilise the economy and promote socio-economic equality, inadequate or inefficient systems can exacerbate inequalities (Bąk and Perzyńska, 2021).

The inequality problem, without exception, but to a varying degree, affects all countries of the European Union. The issue of inequality is gaining importance concerning its tendency to deepen in various EU regions, including, in most cases, developed countries. In the long term, inequalities also pose a threat to long-term and sustainable development. Therefore, it is important to conduct detailed research on this topic. The results obtained in this paper raise the need for in-depth research to identify the causes of inequality in individual countries. Hence, the next stage of analysis will be to consider detailed data on inequality in relation to other sustainable development goals.

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