

## GENDER INEQUALITY INDEX: CALCULATING ANALYSIS

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### Abstract:

*Gender inequality remains a persistent issue worldwide. In order to measure and track progress towards gender equality, the Gender Inequality Index (GII) was introduced by the United Nations Development Programme (UNDP) in 2010. The GII is a composite index that measures gender-based inequalities in three dimensions: reproductive health, empowerment, and labor market participation. This paper provides an overview of the methodology used to calculate the GII, including the selection of indicators and the weighting system. We also discuss the strengths and limitations of the GII as a measure of gender inequality, and highlight areas for future research.*

### Keywords:

*Gender Inequality Index, UNDP, composite index, reproductive health, empowerment, labor market participation*

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### Introduction:

Gender inequality is a persistent and pervasive issue that affects women and girls around the world. Gender inequality can take many forms, including unequal access to education, healthcare, political representation, and economic opportunities. To measure the extent of gender inequality, the Gender Inequality Index (GII) was developed by the United Nations Development Programme (UNDP). The GII takes into account three dimensions of gender inequality: reproductive health, empowerment, and economic activity. This paper aims to provide an overview of the GII and explain how it is calculated.

Transformations in gender roles and empowerment have enabled some countries and groups to improve environmental sustainability and equity, advancing human development. Our gender inequality index (GII), updated this year for 145 countries contribute to gender inequality. This is important because in countries where effective control of reproduction is universal, women have fewer children, with attendant gains for

maternal and child health and reduced greenhouse gas emissions. For instance, in Cuba, Mauritius, Thailand and Tunisia, where reproductive healthcare and contraceptives are readily available, fertility rates are below two births per women. But substantial unmet need persists worldwide, and evidence suggests that if all women could exercise reproductive choice, population growth would slow enough to bring greenhouse gas emission below current levels. Meeting unmet need for family planning by 2050 would lower the world's carbon emission an estimated 17 percent below what they are today.

The GII also to causes on women's participation in political decision making, highlighting that women lag behind men across the world, especially in Sub Saharan Africa, South Asia and the Arab states; this has important implications for sustainability and equity. Because women often shoulder the heaviest burden of resource collection and are the most exposed to indoor air pollution; they are often more affected than men by decisions related to natural resources. Recent studies several that not only is women's participation important but also how they participate and how much. And because women often show more concern for the environment, support pro environmental policies and voto for proenvironmental leaders, their greater involvement in politics and in nongovernmental organizations could result in environments gains, with multiplier effect across all the millennium development goals,

These arguments are not new, but they reaffirm the value of expanding women's effective freedoms. Thus, women's participation in decision-making has both intrinsic value and instrumental importance in addressing equity and environmental degradation.

### **Overview of the Gender Inequality Index:**

The Gender Inequality Index (GII) was first introduced in 2010 by the United Nations Development Programme (UNDP). The GII is a composite measure that takes into account three dimensions of gender inequality: reproductive health, empowerment, and economic activity. The reproductive health dimension includes indicators such as maternal mortality and adolescent fertility rates. The empowerment dimension includes indicators such as the percentage of seats held by women in national parliaments and the percentage of women

with higher education degrees. The economic activity dimension includes indicators such as the labor force participation rate and the percentage of women in managerial positions.

### **Calculating the Gender Inequality Index:**

To calculate the GII, each dimension is first standardized using a minimum and maximum value. The standardized values are then multiplied by a weight that reflects the relative importance of each dimension. The weights used are 0.33 for reproductive health, 0.33 for empowerment, and 0.33 for economic activity.

### **The formula used to calculate the GII is as follows:**

$$\text{GII} = (\text{reproductive health index} \times 0.33) + (\text{empowerment index} \times 0.33) + (\text{economic activity index} \times 0.33)$$

The reproductive health index is calculated using the following indicators: maternal mortality ratio, adolescent birth rate, and the percentage of women who have received antenatal care. The empowerment index is calculated using the following indicators: the percentage of parliamentary seats held by women, the percentage of women with higher education degrees, and the percentage of women who have completed secondary education. The economic activity index is calculated using the following indicators: the labor force participation rate for women and the percentage of women in professional and managerial positions.

Once the GII is calculated, it ranges from 0 to 1, with 0 representing no gender inequality and 1 representing maximum gender inequality.

### **Interpreting the Gender Inequality Index:**

The GII can be used to compare levels of gender inequality between countries and over time. A lower GII indicates a lower level of gender inequality, while a higher GII indicates a higher level of gender inequality. In 2021, the countries with the highest GII scores were Niger, Chad, and the Central African Republic, while the countries with the lowest GII scores were Norway, Switzerland, and Finland.

### **Objectives of the Research**

- 1) To study the Gender Equality, Reproductive Choice & Women Participation in decision making.
- 2) To study the Gender Inequality Index Dimensions and Indicators
- 3) To study the Computing Gender Inequality Index

### **Research Methodology:-**

The research methodology used to calculate the Gender Inequality Index (GII) typically involves a combination of quantitative and qualitative methods. The data used to calculate the index is collected from a variety of sources, including national statistics agencies, international organizations, etc.

### **Gender Equality:-**

Women's economic opportunities and empowerment remain severely constrained. Access to reproductive healthcare has been improving in most regions but not fast enough to achieve Millennium Development Goal 5 (to improve maternal health). Indicators under the target of universal access to reproductive health care include the adolescent birth rate, antenatal care and unmet need for family planning.

Last year's (2010) HDR introduced the Gender Inequality Index (GII) for 138 countries. This year it covers 145 countries, and our updated estimates confirm. That the largest losses due to gender inequality are in Sub-Saharan Africa, followed by South Asia and the Arab States. In sub-Saharan Africa the biggest losses arise from gender disparities in education and from high maternal mortality and adolescent fertility rates. In South Asia women lag behind men in each dimension of the GII, most notably in education, national parliamentary representation and labour force participation. Women in Arab state are affected by unequal labourforce participation. (around half the global average) and low education at attainment. All the low HDI countries have high gender inequality across multiple dimensions of the 34 low HDI countries included in the 2011 GII, all but form also have a GII score in the worst quartile, by contrast, only one very high HDI country and one high HDI country included in the GII perform as badly.

### **Reproductive Choice :-**

Poor reproductive health is a major contributor to gender inequality around the world. Lack of access to reproductive health services results in debilitating outcomes for women children- and to fatalities in excess of those caused by the most devastating natural disasters. An estimated 48 million women give birth without skilled assistance, and 2 million give birth alone. An estimated 150000 women and 1.5 million children die each year between the onset of labour and 48 hours after birth.

For the bottom 20 countries in the GII the population weighted maternal mortality ratio average about 327 deaths per 10000 live births, and the adolescent fertility rate

averages 95 births per 1000 women ages 15-19 both roughly double the global averages of 157 deaths and 49 births. In these countries contraceptive use is low averaging only 46.4 percent. More broadly, an estimated 215 million women in developing countries have unmet need for family planning.

Every country, developed or developing that offers women a full range of reproductive health options has fertility rates at or below replacement. Cuba, Iran, Mauritius, Thailand and Tunisia have fertility rates of less than two births per women. And Addis Ababa's is also less than two births per women, while Ethiopia rural fertility rate remains above six. In much of rural Bangladesh, despite widespread poverty, fertility is now at the replacement rate. And family sizes have fallen as rapidly in Iran as they have in china but without government limits on family size.

#### **Women's Participation Decision Making:-**

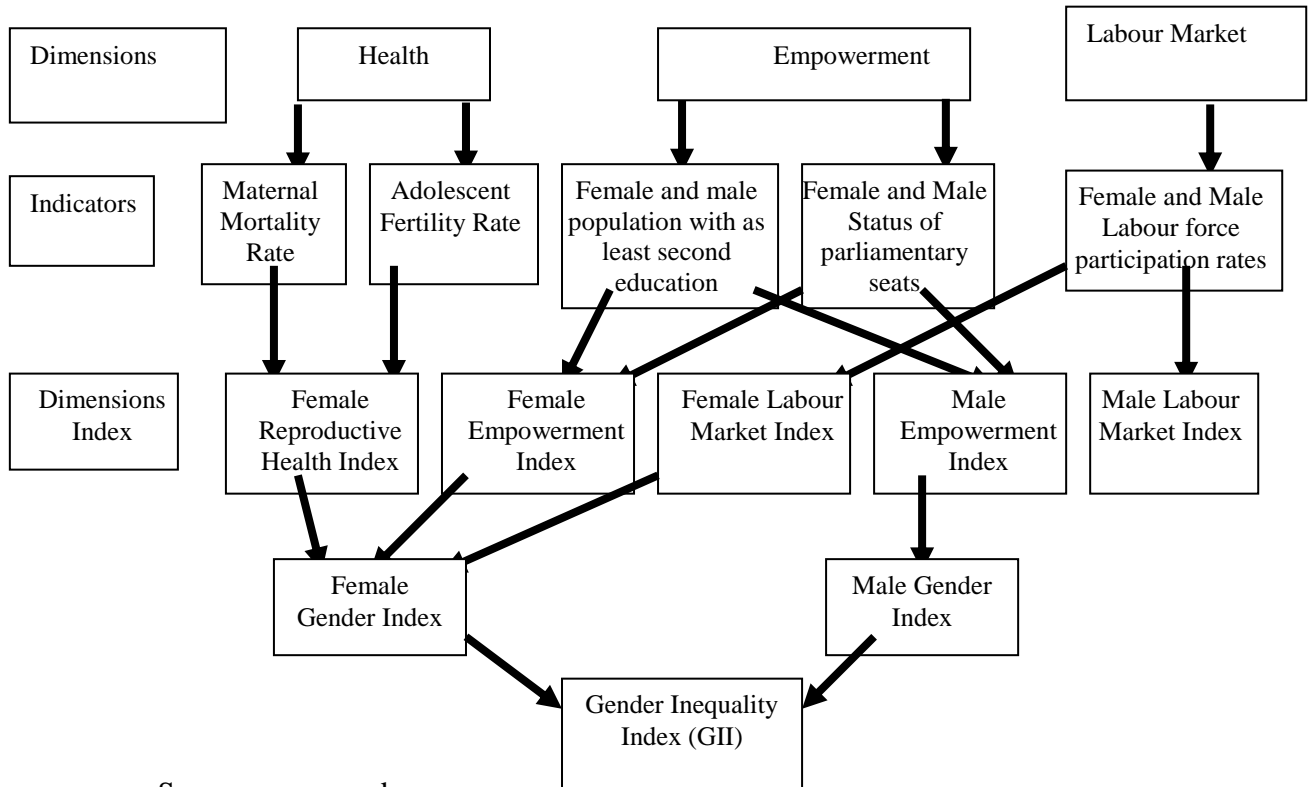
Gender inequalities are also reflected in women's low participation in national and local political form. This has ramifications for sustainability it, as some research suggests, women express more concern for the environment, support more proenvironmental policy and vote for proenvironmental leaders.

- 1) Countries with higher female parliamentary representation are more likely to set aside protected land areas, as a study of 25 developed and 65 developing countries reveals.
- 2) Countries with higher female parliamentary representation are more likely to ratify international environmental treaties, according to a study of 130 countries with about 92 percent of the world's people.
- 3) Of the 49 countries that reduced carbon dioxide emissions between 1990 and 2007, 14 were very high HDI countries, 10 of which had higher than average female parliamentary representation.

But women continue to be underrepresented in national parliaments, on average occupying only 19 percent of seats and according for just. 18 percent of ministers, higher positions are even more elusive; only 7 of 150 elected heads of state and only. 11 of 792 heads of government are women. The situation is similar in local government.

**Gender Inequality Index (GII) Indicators:-**

**Fig. No. 01**



Source: [www.undp.org](http://www.undp.org)

The Gender Inequality Index (GII) reflects gender based disadvantage in three dimensions-reproductive healths, empowerment and the labour market for as many countries as data of reasonable quality allow. The index shows the loss in potential human development due to inequality between female and male achievements in these dimensions. It varies between 0- when women and men fare equally and 1, where one gender fares as poorly as possible in all measured dimensions

**Computing the Gender Inequality Index:-**

There are five steps to computing the GII

**Step 1: Treating Zeros and Extreme Values:-**

Because a geometric mean cannot have a zero values, a minimum value must be set for all component indicators. The minimum is set at 0.1 percent for adolescent fertility rate, share of parliamentary seats held by women, attainment at secondary and higher education levels, and labour market participation rate. Female parliamentary representation of



countries reporting zero is coded as 0.1 percent because even in countries without female members of the national parliaments, women have some political influence.

Because higher maternal mortality suggest poorer maternal health, for the maternal mortality ratio the maximum value is truncated at, 1000 deaths per 10000 births and the minimum value is truncated at 10. It is assumed that countries where maternal mortality ratios exceed 1000 do not differ in their inability to create conditions and support for maternal health and that countries with 1-10 deaths per 100000 births are performing at essentially the same level and that differences are random.

**Step 2 : Aggregating across dimensions within each gender group using geometric means :**

Aggregating across dimensions for each gender group by the geometric mean makes the GII association sensitive.

For women and girls the aggregation formula is

$$G_F = \sqrt[3]{\left[ \frac{1}{MR} \right]^{1/2} \left[ \frac{1}{FR} \right]^{1/2} \left[ \frac{PR_F}{SE_F} \right]^{1/2} \cdot L_{FPR_F}}$$

And for men and boys the formula is

$$G_M = \sqrt[3]{\frac{(PR_M \cdot SE_M)^{1/2} \cdot LF}{PR_M}}$$

The Rescaling by 0.1 of the maternal mortality ratio in the aggregation formula for women and girls is needed to account for the truncation of the maternal mortality ratio minimum at 10. This is a new adjustment introduced in human development report 2011.

**Step 3 : Aggregating across gender groups, using a harmonic mean the female and male indices are aggregated by the harmonic mean to create the equality distributed gender index.**

$$G_M = \text{HARM} \left( G_F, \frac{\left[ (G_F)^{-1} + (G_M)^{-1} \right]}{2} \right)$$

Using the harmonic mean of geometric means within groups captures the inequality between women and men adjusts for association between dimensions.

**Step 4: Calculating the geometric mean of the arithmetic means for each indicator**

The reference standard for computing inequality is obtained by aggregating female and male indices using equal weights (thus treating the genders equality) and the aggregating the indices across dimensions

$$-- G_{FM} = \sqrt[3]{\text{Health} \cdot \text{Empowerment} \cdot \text{LFPR}}$$

$$\text{Where Health} = \left[ \frac{1}{\frac{0}{MR} + \frac{1}{FR}} \right]^{1/2}$$

$$\text{Empowerment} = \sqrt{\frac{PR_F \cdot SE_F + PR_M \cdot SE_M}{2}}$$

and

$$\text{LFPR} = \frac{\text{LFPR}_F + \text{LFPR}_M}{2}$$

Health should not be interpreted as an average of corresponding female and male indices but as half the distance from the norms established for the reproductive health indicators-fewer maternal deaths and fewer adolescent pregnancies.

**Step 5: Calculating the Gender Inequality Index:-**

Comparing the equality distributed gender index to the reference standard yields the GII,

$$1 - \frac{\text{HARM}(G_F, G_M)}{G_{FM}}$$

Example: Lesotho

	Health		Empowerment		Labour Market
	MM	AFR	PR	ASH	LMPR
	R			E	
Fe male	530	73.5	0.229	10.24 3	0.719



Ma	na	na	0.771	0.203	0.787
le					

$$\frac{+M}{2} \sqrt{\frac{0}{530} + \frac{73.5}{73.5}} + 1 = \frac{0.50}{8} \sqrt{\frac{0.229.0243 + 0.771}{2}} = \frac{0.719 + 0.787}{2} = 0.743$$

Note :na = not applicable

Using the above formulas, it is straightforward to obtain

$$G_F 0.134 = \sqrt[3]{\sqrt{\frac{0}{30} + \frac{1}{3.5}} \cdot 0.229.0243.0719}$$

$$G_M 0.675 = \sqrt[3]{\frac{0.771 \cdot 0.203}{.0787}}$$

$$G_{F, M} 0.492 = \sqrt[3]{0.508 \cdot 0.316 \cdot 0.743}$$

$$HARM (G_F, G_M) 0.230 = \left[ \frac{1}{0.134} + \frac{1}{0.675} \right]^{-1}$$

GII 1- 0.230/0.492

GII : 0.532

### India's Gender Inequality Index and Related Indicators

o.	Dimensions & Indicators		o.	Dimensions & Indicators	
	Gender Inequality Index			Labour Force Participation (%)	
	Rank (2011)	1		Female (2009)	2.8
	Value (2011)	29		Male (2009)	1.1
i		.617	i		
	Maternal Mortality Ratio (2008)	2		Reproductive Health	
	Adolescent Fertility Rate (2011)	30		Contraceptive prevalence rate, any method (% of married women's ages 15-49) (2005-09)	4.0
	Seats in National Parliament (% Female) (2011)	8		At least one antenatal visit (%)	5.0
	Population with at	0.7	i	Births attended by skilled health	

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	least secondary education (% age 25 and old)		ii	personal (%) (2005-09)	3.0
	Female (2010)	6.6	v	Total Fertility rate (2011)	.5
i	Male (2010)	0.4		India Human Development Index (2013)	36

Source: HDR 2011

**Conclusion:**

The Gender Inequality Index (GII) is an important tool for measuring gender inequality around the world. By taking into account the dimensions of reproductive health, empowerment, and economic activity, the GII provides a comprehensive view of gender inequality. The GII can be used to track progress towards gender equality and identify areas where further action is needed to address gender inequality.

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