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Ranking of High Human Development Countries with Respect to Variables Relating with Female Living Standards by Using MOORA Method

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Abstract

Various indices are being formed for comparing the standards of countries and by using these indices, the development status of countries are being compared with each other and at the same time, the features of countries that need to be developed are also specified. While these indices are calculated for certain variables, indicators are created separately for women and men. In this study, it is aimed to rank the countries as per the living standards of women. This ranking has been done by using MOORA method, which is one of the multi criteria decision making methods. MOORA is used with many different algorithms. Among these, the most widely used one, Ratio System Approach is used for this study. As a result of the analysis, ranking of living standards provided to women by countries within Human Development Index's high human development category have been determined.

Keywords: MOORA, women, Human Development Index, ranking

1. Introduction

It is known that specifying the living standards in countries and complying with these standards, has an increasing impact on the reasons for these countries' being preferred for living. In order to compare existing standards of countries, various indices are created. Part of them are indices that are formed with the help of data which are collected by official institutions each year and part of them are indices which are formed by individuals for helping to compare the countries with each other.

Human Development Reports, which is declared within the frame of United Nations Development Programme in year 1990 for the first time, are the reports that are regularly shared with the public each year and which are mostly used as reference in the sorting of all countries (United Nations Development Programme Human Development Index, 2018). In these reports, there are indices which are formed by using the variables of countries relating with economy, life expectations, and education and Human Development Index (HDI) values, which are created by bringing these indices together as being used to compare all the countries with each other with respect to development. As per the results of indices, in HDI reports covering 188 countries, there are four categories under which countries are gathered: very high human development, high human development, medium human development and low human development.

While development indices are calculated, various criteria are considered. By using these indices, it is possible to compare development status of countries with each other. Development of countries, which is related with various variables, is also related with the individuals', in those countries, to have equal rights. Therefore, while majority of indices are calculated, in order to reveal gender inequality status, indicators are created separately for males and females. Women's rights and living standards of women are topics relating to which investigations are made for tens of years and regarding which proposals are made for improvements.

Women's having equal rights, their having adequate shares within national income, and even their having equal right to speak as men, would create differences in the development levels of countries.

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Development of a community is possible through the development of all individuals, without making any discrimination as per gender. HDI, has formed various indicators separately for men and women. In the literature, there are many researches that are conducted by using HDI regarding the living standards of women and their places in the community. In his study, Sharma (1997) has criticized HDI and he has proposed that more vital contributions should be made to the index for ensuring that sensitivity relating with gender differences is shown in a recognizable way. Mihci and Taner (2014) have compared development performances of Middle Eastern and North African countries with Turkey. In this comparison, they have used gender-base data and as a result they have determined that increasing the development relating with women would cause changes to occur in the development ranking of the relevant country. In the study they realized, Dijkstra and Hanmer (2000), have defended that in fact, the results of Gender- Related Development index, being created by UNDP, did not realize an adequate measurement. Starting from this point on, in order to reveal gender inequality, they have created an index being composed of socioeconomic variables and they have compared the index scores they have obtained with the results of index being formed with HDI. By analyzing Gender Gaps in Life Expectancy values for the period between the years of 1947 and 2010, Liu et al, (2013) have analyzed the relationship between social development indicators and death rates as per gender.

They have compared the results they obtained from here with HDI values and they have found out that Japanese women reached to the life standards of men. By using the variables relating with assets, health, schooling, and empowerment for 14 Sub-Saharan African countries, Batana (2013) has conducted a study to reveal the power of women. In his study, he has used Gender-related development index and HDI data. As a result of his study, he has reached to the conclusion that power of economic indicators of countries and economic power of women were directly proportional. In their study, Booysen et al (2011) have defended that between the years of 1996 and 2001, development situation of women in Southern Africa started to decline.Starting from this opinion onwards and by using HDI values, they have presented a projection for South African countries depending on gender. In their study, Maniyalath and Narendran (2016) have focused on female entrepreneurs. Starting from the fact that in previous studies it was revealed that there was an inverse relationship between national income and number of female entrepreneurs, and by using the data for 2012 being obtained from Global Entrepreneurship Monitor, they have investigated whether there is a criterion that can be used to reveal the ratio of HDI regarding female entrepreneurship. As a result of the study, even though it was determined that there is a relationship between national income and female entrepreneurship, it was found out that there are many different socioeconomic variables having influence on development ratio.

Nowadays when human development, being measured with many different criteria, and ranking of countries being done in accordance, are important, in this study which is conducted to see the ranking of countries only as per the living standards of women, with the help of variables that are measured for women and which reveal their place, welfare, and standards in the community, a ranking is formed for high human developed countries and this ranking is compared with HDI ranking of countries. In this way, with the help of difference between the ranking of HDI and the ranking being formed by means of variables relating with women, an opinion has been reached relating with the place of women's welfare in HDI.

2. MOORA (Multi Objective Optimization On Basis Of Ratio Analysis)

MOORA, which is one of the decision making methods with many criteria as being frequently used in recent years both due to its easiness of application and easiness of interpretation, has been first used in the study conducted in year 2006 by Brauers and Zavadskas relating with the privatization in the passage economy (Brauers & Zavadskas, 2006). When compared with other decision making techniques, MOORA method provide different advantages. Comparison of this method with the other decision making methods with many criteria is given in Table 1.

Table 1. Comparison of multi criteria decision making methods

MODM	Computational Time	Simplicity	Stability
MOORA	Very less	Very simple	Good
AHP	Very high	Very critical	Poor
TOPSIS	Moderate	Moderately critical	Medium
VIKOR	Less	Simple	Medium
ELECTRE	High	Moderately critical	Medium
PROMETHEE	High	Moderately critical	Medium

Source: Brauers, W., & Zavadskas, E. (2012). Robustness of MULTIMOORA: A Method for Multi Objective Optimization. *Informatica, 23*(1), 1-25

MOORA method applications which began to be used more often in recent years in the studies where ranking is done, both due to quickness of processing and due to having good reliability, are also frequently seen in the studies where regional superiorities are compared with each other. Brauers et al (2010) have ranked regional developments with economic, demographic, and social variables for local regions of Lithuania. Brauers et al (2011), have ranked European Union member countries as per their performances to reach 2000-2008 Lisbon strategies by using fuzzy MULTIMOORA technique. Again, Brauers et al (2014) have ranked 20 European countries by using different criteria measuring the construction sector during the economic recession period in years 2008-2009.

MOORA, which is used with many different algorithms, is seen as Ratio System Approach, Reference Point Approach, Significance Coefficient, Total Multiplication Form, and MULTI MOORA applications in the literature. Among these, the most widely used ones are Ratio Method and Reference Point Approach (Önay, 2014, s. 246). Since in this study, ratio method is used to rank the high human developed countries as per gender, only the methodology relating with the ratio method has been explained.

2.1. Ratio System Approach

Steps relating with the process to be followed when applying Ratio System are given below.
Step 1: First of all, decision matrix that is obtained for different values of different observations and which is shown with Equation 1 is created (Tamrin & Zahrim, 2017, s. 15866).

$$X = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ \dots & \dots & \dots & \dots \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \quad (1)$$

Step 2: While *i=1,2, …, m* are number of alternatives and *j= 1,2, …,n* are number of criteria, normalization process is realized and x_{ij}^* values are calculated with the help of Equation 2. (Yıldırım & Önay, 2013, s. 69)

$$x_{ij}^* = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}} \quad (2)$$

Step 3: Normalized values are optimized by making additions in case the criteria are maximized and by subtracting, in case the criteria are minimized. The process being followed up is shown with Equation 3.

$$y_i^* = \sum_{j=1}^{g} x_{ij}^* - \sum_{j=g+1}^{n} x_{ij}^* \quad (3)$$

In Equation 3 *g*, denotes number of maximized criteria and *(n-g)* denotes number of minimized criteria (Chakraborty, 2011, s. 1157).
Step 4: Row numbers are given as per the size of y_i values that are obtained with the help pf Equation 3.

3. Application

Human development index, which is calculated each year, enable for ranking to be done as per development of countries. As it is known, many indicators are used in the calculation of this index. By evaluating these indicators together, characteristics of countries such as their welfare levels, social status, economic situations, and livability, can be considered all together. However, when consideration is made only with regards to women, a ranking through which their welfare levels, social status, places in the economy, and the countries where they can live with easiness, shall enable for the countries to be evaluated from a different respect. In this study, ranking of countries as per the living standards of women, will be made.

In this way, the ranking of countries within high human development category will be revealed with regards to the opportunities they provide to women. Thus, variables that are gathered from the databases of World Health Organization, UNDP, and World Bank, as relating with women for year 2015 are shown in Table 2. These variables are named as "criteria" in MOORA method.

Table 2. Names and Definitions of Criterias

Criteria No	Defination of Criteria
C1	Prevalence of obesity, female (% of female population ages 18+)
C2	Self-employed, female (% of female employment) (modeled ILO estimate)
C3	Maternal Mortality (deaths per 100000 live births)
C4	Adolescent birth rate (births per 1000 women ages 15-19)
C5	Share of seats in parliament (% held by women)
C6	15-60 adult mortality (per 1000 alive at age 15) female
C7	Mean years of Schooling
C8	Estimated Gross National Income per Capita (2011 PPP$)
C9	Labor Force Participation Rate
C10	Age-Standardized Suicide Rates-female (per 100000 population)

Variables can be shortly explained as stated below:

Prevalence of obesity, female (% of female population ages 18+): It is defined as the ratio of women ,being aged 18 or above, as having body mass indices, which are obtained by dividing weights in terms of kilograms to the square of heights in terms of meters, over 30 kg/m^2. This situation is accepted as an indicator of obesity (The World Bank, 2017).

Self-employed, female (% of female employment) (modeled ILO estimate): Self-employed workers denote people working on their own or with a few partners. This variable shows the ratio of those working in their own business to the number of all female workers being registered (The World Bank, 2017).

Maternal Mortality (deaths per 100000 live births): It shows the ratios of death incidents of women, taking places within 42 days following the pregnancy period, not originating from an accident or from an external factor (World Health Organization, 2018).

Adolescent birth rate (births per 1000 women ages 15-19): It shows annual birth numbers for 1000 women between the ages of 15-19, being named as fertility rate(World Health Organization, 2018).

Share of seats in parliament (% held by women): It shows the ratio of female politicians among the total politicians in the parliamentary (UNDP, 2016, s. 215).

15-60 adult mortality (per 1000 alive at age 15) female: This variable shows the death rate of adult women in the age group of 15-60 (United Nations, 2017, s. 31).

Mean years of Schooling: It denotes the average years of education of all adult women being aged 25 or above, regardless of their education levels (UNDP, 2016).

Estimated Gross National Income per Capita (2011 PPP$): It shows the share of women in the Gross National Income, being calculated for the active population (UNDP, 2016).

Labor Force Participation Rate: This variable shows how much place women have within the labor force of a country. The values being obtained denote adult women who are aged 15 or above and who work in the provision of services (The World Bank, 2017).

Age-Standardized Suicide Rates-female (per 100000 population): It shows the ratio of women dying by giving damage to themselves among 100000 people, being weighted as per people's ages (World Health Organization, 2018).

As it is previously stated, the ranking will be done for the countries being specified in high human development category in the report that is declared by Human Development Index(UNDP, 2016). In this category, there are 55 countries in total.

However, among these countries as many variables relating with Palau, Antigua and Barbuda, Grenada, Saint Kitts and Nevis, Dominica and Seychelles for year 2015 could not be reached, they are taken out of the study. Thus, 49 countries that are included in the ranking and which are named as "alternatives" in MOORA method and their alternative numbers which will be used during the analysis are given in Table 3.

Table 3. Names of the High Human Development Countries

Alternatives	High Human Development	Alternatives	High Human Development	Alternatives	High Human Development
A1	Belarus	A18	Tonga	A34	Maldives
A2	Oman	A19	Samoa	A35	Iran, Islamic Rep.
A3	Barbados	A20	Panama	A36	Georgia
A4	Uruguay	A21	Mauritius	A37	Turkey
A5	Bulgaria	A22	Trinidad and Tobago	A38	Venezuela, RB
A6	Kazakhstan	A23	Costa Rica	A39	Sri Lanka
A7	Bahamas, The	A24	Serbia	A40	Albania
A8	Malaysia	A25	Cuba	A41	Lebanon
A9	Mexico	A26	Bosnia and Herzegovina	A42	Fiji
A10	Azerbaijan	A27	Macedonia, FYR	A43	Mongolia
A11	Brazil	A28	Peru	A44	St. Lucia
A12	Algeria	A29	Thailand	A45	Jamaica
A13	Armenia	A30	Ecuador	A46	Suriname
A14	Ukraine	A31	China	A47	St. Vincent and the Grenadines
A15	Jordan	A32	Dominican Republic	A48	Belize
A16	Colombia	A33	Libya	A49	Uzbekistan
A17	Tunisia				

As a result of discussions held with sociologists who are specialized in their fields, in order for the living standards of women to be improved, it is recommended for C2, C5, C7,C8 and C9 criteria to be maximized and for C1, C3, C4, C6 and C10 criteria to be minimized.

Starting from this point on, values that are obtained by the normalization of criteria and results for y^*value which is calculated from the optimization process

Table 4.Results that are obtained from MOORA Method

Optimization	min	max	min	min	max	min	max	max	max	min	
Country	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	y^*
A1	0,128	0,009	0,01	0,062	0,196	0,16	0,178	0,175	0,157	0,157	0,2
A2	0,163	0,041	0,043	0,027	0,055	0,108	0,115	0,224	0,087	0,038	0,142
A3	0,151	0,045	0,068	0,138	0,132	0,114	0,159	0,168	0,18	0,003	0,21
A4	0,148	0,092	0,038	0,19	0,129	0,115	0,132	0,208	0,16	0,183	0,046
A5	0,118	0,033	0,028	0,128	0,137	0,127	0,162	0,185	0,14	0,14	0,117
A6	0,109	0,098	0,03	0,094	0,135	0,188	0,175	0,233	0,191	0,279	0,131
A7	0,185	0,084	0,2	0,1	0,112	0,181	0,172	0,233	0,2	0,012	0,124
A8	0,086	0,103	0,1	0,046	0,089	0,123	0,15	0,244	0,142	0,099	0,274
A9	0,159	0,125	0,095	0,213	0,273	0,123	0,123	0,152	0,131	0,061	0,153
A10	0,113	0,276	0,063	0,202	0,114	0,13	0,154	0,157	0,179	0,032	0,338
A11	0,123	0,096	0,11	0,227	0,073	0,144	0,121	0,152	0,162	0,079	-0,078
A12	0,168	0,136	0,351	0,036	0,173	0,129	0,099	0,057	0,048	0,038	-0,209
A13	0,111	0,163	0,063	0,078	0,072	0,107	0,169	0,079	0,158	0,052	0,23
A14	0,126	0,053	0,06	0,082	0,081	0,169	0,169	0,082	0,151	0,18	-0,08
A15	0,209	0,014	0,145	0,079	0,078	0,142	0,145	0,046	0,041	0,07	-0,321
A16	0,129	0,188	0,16	0,17	0,14	0,136	0,114	0,145	0,167	0,061	0,099
A17	0,166	0,072	0,155	0,023	0,21	0,111	0,1	0,066	0,072	0,119	-0,053
A18	0,265	0,237	0,311	0,051	0	0,155	0,165	0,056	0,152	0,096	-0,269
A19	0,268	0,141	0,128	0,085	0,041	0,144	0,145	0,049	0,067	0,081	-0,263
A20	0,133	0,106	0,236	0,252	0,123	0,121	0,154	0,207	0,146	0,032	-0,038
A21	0,075	0,061	0,133	0,097	0,078	0,144	0,132	0,15	0,135	0,108	0
A22	0,125	0,056	0,158	0,107	0,212	0,187	0,162	0,3	0,152	0,131	0,175
A23	0,146	0,068	0,063	0,191	0,224	0,092	0,13	0,142	0,135	0,058	0,149
A24	0,106	0,094	0,043	0,064	0,229	0,12	0,154	0,137	0,125	0,16	0,246
A25	0,147	0,078	0,098	0,154	0,329	0,114	0,172	0,071	0,123	0,122	0,138
A26	0,089	0,09	0,028	0,029	0,13	0,101	0,117	0,099	0,099	0,055	0,233
A27	0,107	0,085	0,02	0,06	0,224	0,108	0,133	0,129	0,127	0,09	0,312
A28	0,117	0,222	0,17	0,166	0,15	0,147	0,126	0,127	0,19	0,084	0,13
A29	0,06	0,21	0,05	0,151	0,041	0,16	0,115	0,184	0,181	0,224	0,087
A30	0,119	0,202	0,16	0,257	0,28	0,133	0,123	0,118	0,141	0,108	0,087
A31	0,031	0,146	0,068	0,025	0,159	0,11	0,108	0,153	0,183	0,276	0,24
A32	0,164	0,113	0,231	0,332	0,128	0,182	0,118	0,132	0,151	0,076	-0,341
A33	0,193	0,151	0,023	0,021	0,108	0,15	0,115	0,102	0,162	0,081	0,171
A34	0,053	0,106	0,17	0,023	0,04	0,09	0,093	0,102	0,165	0,259	-0,09
A35	0,156	0,166	0,063	0,09	0,021	0,098	0,127	0,073	0,047	0,084	-0,057

A36	0,114	0,22	0,09	0,134	0,076	0,098	0,184	0,087	0,165	0,044	0,253
A37	0,19	0,145	0,04	0,093	0,1	0,113	0,105	0,152	0,088	0,137	0,016
A38	0,139	0,146	0,238	0,269	0,114	0,138	0,145	0,165	0,148	0,032	-0,097
A39	0,034	0,171	0,075	0,05	0,033	0,114	0,154	0,086	0,087	0,387	-0,129
A40	0,036	0,218	0,073	0,073	0,139	0,077	0,142	0,105	0,116	0,07	0,392
A41	0,18	0,071	0,038	0,042	0,021	0,078	0,124	0,083	0,068	0,058	-0,029
A42	0,171	0,161	0,075	0,152	0,108	0,212	0,163	0,067	0,107	0,125	-0,13
A43	0,111	0,17	0,11	0,053	0,097	0,2	0,15	0,125	0,163	0,268	-0,037
A44	0,13	0,107	0,12	0,183	0,139	0,166	0,141	0,114	0,182	0,047	0,038
A45	0,162	0,125	0,223	0,202	0,112	0,153	0,145	0,094	0,166	0,009	-0,105
A46	0,164	0,369	0,388	0,156	0,171	0,184	0,123	0,149	0,117	0,367	-0,329
A47	0,15	0,037	0,113	0,173	0,087	0,195	0,165	0,108	0,162	0,012	-0,082
A48	0,152	0,095	0,07	0,223	0,089	0,201	0,157	0,076	0,162	0,058	-0,124
A49	0,091	0,099	0,09	0,06	0,11	0,2	0,177	0,055	0,139	0,151	-0,011

With the ranking of y^* values, which are shown in Table 4, from the biggest to the smallest ones, countries will be sorted from those where the living standards of women are good to the countries where they are lower. In this study it is aimed to compare this ranking with the ranking of countries in high human development category in HDI reports within themselves. Therefore, in Table 5, ranking relating with female living standards being obtained as a result of MOORA application for countries and ranking of HDI high human development countries are shown.

Table 5. Female Standards Rankings and HDI Rankings of High Human Developed Countries

Country	Female Standarts Ranking	HDI Ranking	Country	Female Standarts Ranking	HDI Ranking
Albania	1	20	St. Lucia	26	37
Azerbaijan	2	23	Turkey	27	17
Macedonia, FYR	3	26	Mauritius	28	10
Malaysia	4	8	Uzbekistan	29	49
Georgia	5	16	Lebanon	30	21
Serbia	6	13	Mongolia	31	36
China	7	34	Panama	32	9
Bosnia and Herzegovina	8	25	Tunisia	33	41
Armenia	9	28	Iran, Islamic Rep.	34	15
Barbados	10	3	Brazil	35	24
Belarus	11	1	Ukraine	36	29
Trinidad and Tobago	12	11	St. Vincent and the Grenadines	37	43
Libya	13	45	Maldives	38	48
Mexico	14	22	Venezuela, RB	39	18
Costa Rica	15	12	Jamaica	40	38

Oman	16	2	Belize	41	46
Cuba	17	14	Sri Lanka	42	19
Kazakhstan	18	6	Fiji	43	35
Peru	19	31	Algeria	44	27
Bahamas, The	20	7	Samoa	45	47
Bulgaria	21	5	Tonga	46	44
Colombia	22	39	Jordan	47	30
Thailand	23	32	Suriname	48	40
Ecuador	24	33	Dominican Republic	49	42
Uruguay	25	4			

It is found out that the best country where women can live with regards to the living standards is Albania. However, Albania ranks in 20th row among high human developed countries. Similarly, while it is determined that Azerbaijan is the second country with respect to the living standards of women, HDI high human development ranking of this country is 23. While coming to the end of the list, variations are seen in the ranking of countries. HDI high human developed country rankings of countries of Jordan, Suriname and Dominican Republic which come out in the last rows, are also at the end rows. HDI ranking of Jordan, which ranks as the 47th country in the sorting according to the female living standards, is 30, while HDI ranking of Suriname is 40 and that of Dominican Republic is 42.

In order to investigate the existence of a relationship between the ranking that is done for countries with regards to female living standards and ranking of HDI high human development countries, Spearman's Rho Correlation Coefficient has been calculated and the results, which are shown in Table 6, have been obtained.

Table 6. Examination of the Correlation between Female Living Standards and HDI High Human Development Rankings

			female	hdi
Spearman's rho	female ranking	Correlation Coefficient	1,000	0,488**
		Sig. (2-tailed)	.	0,000
		N	49	49
	hdi ranking	Correlation Coefficient	0,488**	1,000
		Sig. (2-tailed)	0,000	.
		N	49	49

** Correlation is significant at the 0.01 level (2-tailed).

Spearman's rho correlation coefficient which is shown in Table 6, reveals that there is a positive low level of relationship between the rankings of countries in high human development categories and female living standards that are established by using MOORA method. As the rankings in Table 5 are examined, it is seen that countries which rank in the last rows of sorting of HDI high human development countries, are also at the last rows of ranking done as per female living standards.

Conclusion

Rankings being done in order to reveal the development of countries, area realized by examining variables under many different headings such as economic, social, technological developments and cultural developments. While these rankings show the development levels of countries, they also reveal the features to be developed by making comparison with the other countries.

Starting from this point on, this study has been realized to reveal the difference of ranking improving the lives of women from the ranking of development in case such a ranking for improving the lives of women exists and to specify the countries where women can live most comfortably with respect to living standards.

In this study, Ratio System approach of MOORA method, that is one of the multi-criteria decision making methods, which is started to be used significantly in recent years, has been used. In this way, by using the data which are specified only for women and which are obtained from databases of The World Bank, UNDP, United Nations Development Programme and World Health Organization, ranking has been done regarding the improvement of living standards of women.

As per the results being obtained, differences have been observed among the female living standards of countries and HDI high human development rankings. It is seen that five countries, being Albania, Azerbaijan, Macedonia, Malaysia and Georgia, which are ranked in the top five rows with regard to the wellness of female lives, are in the middle rows in the ranking that is done with regards to HDI. From this point onwards, it could be stated that women are not adequately represented within HDI outcomes. In the ranking that is done by using the variables relating with women, it is specified that the five countries ranking in the last rows were Samoa, Tonga, Jordan, Suriname and Dominican Republic.

When HDI ranking of these countries are examined, it is seen that they ranked in the last rows of the list, again. This situation reveals that countries' being in the last rows of HDI ranking, is an indicator of their also ranking in the last rows with regards to women's potential to live in welfare.

Using more number of variables relating with gender differences in the development reports that are used for the ranking of countries, or increasing their weights, and announcing the rankings, shall initiate the relevant countries to make reforms regarding gender inequalities. On the other hand, countries that provide equality or development by making reforms relating with gender inequalities, will be at higher rows in the rankings.

References

Batana, Y. (2013, June). Multidimensional Measurement of Poverty Among Women in Sub-Saharan Africa. Social Indicators Research, 112(2), 337-362.

Booysen, A., Fourie, F., & Botes, L. (2011, March). The development status of women in South Africa: Patterns and progress in the provinces. Development Southern Africa, 28(1), 99-119.

Brauer, W., Zavadskas, E., & Kildienė, S. (2014). Was the Construction Sector in 20 European Countries Anti-Cyclical during the Recession Years 2008-2009 as measured by Multicriteria Analysis (MULTIMOORA)? Procedia Computer Science, 31, 949 – 956.

Brauers, W. K., & Zavadskas, E. K. (2006). The MOORA method and its application to privatization in a transition economy. Control and Cybernetics, 35(2), 445-469.

Brauers, W., & Zavadskas, E. (2012). Robustness of MULTIMOORA: A Method for Multi-Objective Optimization. Informatica, 23(1), 1-25.

Brauers, W., Baležentis, A., & Baležentis, T. (2011). Multimoora for the EU member states updated with fuzzy number theory. Technological and Economic Development of Economy, 17(2), 259-290.

Brauers, W., Ginevičius, R., & Podvezko, V. (2010). Regional development in Lithuania considering multiple objectives by the MOORA method. Technological and Economic Development of Economy, 16(4), 613-640.

Chakraborty, S. (2011, June). Applications of the MOORA method for decision making in manufacturing environment. The International Journal of Advanced Manufacturing Technology, 54(9-12), 1155-1166.

Dijkstra, A., & Hanmer, L. (2000). Measuring socio-economic gender inequality: Toward an alternative to the UNDP gender-related development index. Feminist Economics, 6(2), 41-75.

Liu, Y., Arai, A., Obayashi, Y., Kanda, K., Boostrom, E., Lee, R., & Tamashiro, H. (2013). Trends of gender gaps in life expectancy in Japan, 1947–2010:Associations with gender mortality ratio and a socialdevelopment index. Geriatrics Gerontology International , 13, 792-797.

Mıhcı, H., & Taner, M. (2014). Comparative Human Development and Gender Equality Performance Analysis of Middle Eastern and North African Countries with Turkey. International Journal of Economics and Financial Issues, 4(4), 859-869.

Maniyalath, N., & Narendran, R. (2016). The human development index predicts female entrepreneurship rates. International Journal of Entrepreneurial Behavior & Research, 22(5), 745-766.

Önay, O. (2014). MOORA. B. Yıldırım, & E. Önder içinde, Çok Kriterli Karar Verme Yöntemleri. İstanbul: Dora Yayıncılık.

Sharma, S. (1997, February). Making the Human Development Index (HDI) gender-sensitive. Gender and Development, 5(1), 60-61.

Tamrin, K., & Zahrim, A. (2017, July). Determination of optimum polymeric coagulant in palm oil mill effluent coagulation using multiple-objective optimisation on the basis of ratio analysis (MOORA). Environmental Science and Pollution Research, 24(19), 15863-15869.

The World Bank. (2017, December 10). Databank. December 10, 2017 tarihinde Gender Statistics: http://databank.worldbank.org/data/reports.aspx?source=gender-statistics adresinden alındı

UNDP. (2016). Human Development Report 2016. Washington: UNDP.

United Nations. (2017). World Mortality Reports 2015 Highlights. New York: United Nations.

United Nations Development Programme Human Development Index. (2018, 2 12). About Human Development. 2 12, 2018 tarihinde What's human development?: http://hdr.undp.org/en/humandev adresinden alındı

World Health Organization. (2018, February 15). World Health Organization. February 15, 2018 tarihinde Global Health Observatory (GHO) data: http://www.who.int/gho/en/ adresinden alındı

Yıldırım, B., & Önay, O. (2013, December). Bulut Teknolojisi Firmalarının Bulanık AHP-MOORA Yöntemi Kullanılarak Sıralanması. İ.Ü. İşletme Fakültesi İşletme İktisadı Enstitüsü Yönetim Dergisi, 24(75), 59-81.

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