

A Survey of Sub-provincial Disparities of HDI in Iran

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Abstract: Regional disparities of human development within many developing countries like Iran are serious obstacles to their integrated development. To adopt efficient policies in order to reduce existent disparities, it is necessary to measure development level of regions in the status quo. In this way, Human Development Index (HDI) is one of the efficient and widely used methods to measure human development of regions and countries. The aim of this study is to investigate sub-provincial disparities of human development in Iran. Meanwhile calculating HDI, this paper addresses two criticisms on HDI including substitution possibilities between its three indices and its common application at aggregated levels which may conceal wide regional disparities and blur the picture of human development within a country. To overcome these shortcomings, it was defined a simple set of fuzzy rules to determine the development level (DL) at sub-province level. Fuzzy classification of DL considerably reduces the substitution possibilities between individual components of HDI and directly reflects the effect of each component on overall DL, and analyzing human development at sub-province level reveals interregional and intraregional disparities more precisely. Based on suggested fuzzy classification, it was defined seven categories for DL including: very high, high, medium-high, medium, low-medium, low and very low. Results showed that a large number of sub-provinces lie in the lower levels of development, and revealed very stark differences of human development among sub-provinces. This study highlights the importance of reducing disparities in Iran to pave way for greater national integration and sustainable development.

Key words: Regional disparities, developing countries, Human Development Index (HDI), Development Level (DL), Iran.

INTRODUCTION

There are large regional inequalities within many countries (Krugman, 1999); these Inequalities have increased during the past two decades in a high proportion of regions in the world (Arocena and Senker, 2003). Regional inequalities represent an ever-present development challenge in most countries, especially those with large geographic areas under their jurisdictions (Shankar and Shah, 2003). The most dramatic expressions of regional imbalance are found in the Third World (Bjorvatn, 1999) and many developing countries are also facing the problem of increasing regional disparity (Hu, 2002). Large regional disparities represent serious threats as the inability of the state to deal with such inequities creates potential for disunity and, in extreme cases, for disintegration (Shankar and Shah, 2003). Regional disparities have been of interest to researchers and there has been considerable empirical research on the nature and causes of differences in regional output and growth (Chen and Groenewold, 2010). Regional integration is likely to be a more pronounced policy in the future decades (Bjorvatn, 1999).

In Iran, regional disparities have been growing at an alarming rate leading to serious problems including migration with its associated problems from backward provinces to the more developed ones (Noorbakhsh, 2002). The Human Development Report for Iran in 1999 reflects such disparities and reiterates that one of the major human development policies in the country's Third Plan is to "pay attention to the spatial planning as a long-term framework for social justice and regional balance" (Plan and Budget Organization of the Islamic Republic of Iran and United Nations, 1999, p. 141). This report observes wide regional disparities within 26

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provinces of Iran in terms of HDI and its gender adjusted indices and the human poverty index. After dividing provinces into higher, medium and lower groups according to the value of their HDI, the report highlights the extent of regional disparities and the need to deal with them: "The level of deprivation seen in the third group and the vast areas covered by the provinces in the second group suggest that special disparity-reducing measures need to be taken" (Ibid, p. 20). The report concludes the analysis of regional disparities in human development by stating that "An improvement in human development in the I.R. of Iran as a whole requires not only a higher rate of economic growth but also a more equitable distribution of health and education facilities" (Ibid, p. 23). The Law of the Fourth Economic, Social and Cultural Development Plan of the Islamic Republic of Iran (2005-2009) states that "In order to establish justice and social stability, to reduce social and economic disparities, to reduce the gap between income deciles and to secure fair distribution of income in the country, as well as to alleviate poverty and deprivation, enabling the poor, via allocation of effective and targeted allocation of the social security resources and payment of subsidy, government is bound to prepare and implement comprehensive plans for eradicating poverty and promoting social justice on the basis of the ..." (Management and Planning Organization of Iran, 2005, p. 136). Overall, two factors are accounted as main causes of spatial inequality in Iran: (1) The centralized and sectoral nature of the political, administrative and social structure of Iran, which began in the mid-19th century with the entry of capitalism and which was institutionalized during the 1920s; and (2) The planning of the national economy according to principles of regional efficiency based on natural resources, along with the capital-oriented policy which expanded via organizational planning from 1949 onwards (Amir Ahmadi, 1986).

We can safely argue that developing countries already suffering from poverty, poor health, high levels of illiteracy, low economic growth, and political instability would be much more prone to corruption than developed countries (Desta, 2006). As typically rich regions have better educated and better skilled labor, the gulf between rich and poor regions widens (Shankar and Shah, 2003). However, if there are no conditions for a sustainable human development (such as, high inequality in income distribution or a low access to education institutions and health services), an environmentally friendly sustainable development may not take place (Distaso, 2007). The Millennium Development Goals (MDGs), endorsed by heads of states from 189 member countries of the United Nations, encompass measurable targets in seven areas for the developing world: (i) eradicate extreme poverty and hunger; (ii) achieve universal primary education; (iii) promote gender equality and empower women; (iv) reduce child mortality; (v) improve maternal health; (vi) combat HIV/AIDS, malaria, and other diseases; and (vii) ensure environmental sustainability. Progress on the majority of these goals is to be measured on the basis of education and health indicators (Gupta and Cui, 2008). These MDGs have moved to the center stage of the development debate and reducing poverty and deprivation has become a central challenge for policy makers (Klasen, 2008).

To be able to design policies of balanced development, one should have a tool for measuring development level of regions in the status quo. Without this tool, it is difficult to formulate a policy for development because it is impossible to tell whether the society is on a development path or not. Measuring development has been a matter of debate for nearly half a century (Noorbakhsh, 2002). In the early development literature, income per capita was traditionally used for measuring human development (Despotis, 2005). This conventional way of assessing development by economic indicators has been challenged many times during this period (Noorbakhsh, 2002). As early as 1954 a report by the United Nations on social policy and planning regarded economic growth as a requirement for better living standards rather than the ultimate policy aim (United Nations, 1954). One of the drawbacks to the interpretation of development as economical growth is that economical growth considers only economical dimension. In fact, Development is a more complex and different concept that is necessarily related to human life quality. So, for decades, the concept of human development has been developing upon this idea that income is not all the life and global development cannot be measured only by GDP (Soltanpanah *et al.*, 2010). In an attempt to consider different aspects of life when measuring human development, the United Nations Development Program (UNDP) introduced in 1990 the Human Development Index (HDI), which ever since is published annually in the Human Development Report (UNDP, 2000). HDI is one of the most important criteria for measurement of development rate and achievement of MDGs, by which not only one can determine rank and place of each country in global society for human development rate, but also one can measure distance of each country against MDGs by reviewing trend of this index. This is a suitable criterion to evaluate macro plans of each country and exerting some modifications if necessary (Soltanpanah *et al.*, 2010). The UNDP's HDI is based on three dimensions considered as three essential choices of the people. These are health, education and income (Foster *et al.*, 2003; Sanusi, 2008). The growing global focus on the MDGs has further highlighted the importance of making tangible progress in key education and health indicators (Gupta and Cui, 2008). A number of studies confirm that investments in human

resource development, especially primary education and preventive health-care, yield significant gains in productivity and income (Mundle, 1998). In this regard, a number of international and bilateral development agencies have endorsed a human rights orientation in the provision of health care and education in developing countries (Gauri, 2004).

When the UNDP launched the HDI for the first time in 1990, its major goal was to focus attention away from income towards a more comprehensive measure of human development. UNDP did not deny, of course, that per capita income is one of the main determinants of a country's level of human development. But it proposed to treat income as only one out of three factors - the other ones currently being life expectancy at birth as a proxy for health achievement and adult literacy together with educational enrolment as a proxy for educational attainment. What is more, income is not privileged as *primus inter pares*, i.e. it is not given a higher weight than the two other factors. Rather, all three variables are aggregated via a simple arithmetic average into the HDI and are thus treated equally (Neumayer, 2001). Since the introduction of HDI, the index has become a major technique for measuring human welfare. The growing popularity of the technique indicates that the HDI is a huge success. It has become an annual event to produce HDI for countries of the world by the UNDP. In addition, country-based human development reports are also produced to focus on the status of the human development indices within nations of the world. With this approach, human development is seen not only in terms of the income of the people but also in terms of other welfare variables which also directly influence quality of human beings. By way of interpretation, the higher the HDI, the higher the quality of human life and the lower the level of deprivation and poverty among the people. To the authors of this index, the implication is that human development is higher if more people are educated and if people lead a longer life as a result of better medical service, better sanitation and dependable access to clean drinking water (Sanusi, 2008).

As much as the HDI has introduced new way of development thinking, it has also been faced with a number of criticisms. Some of the major criticisms on HDI are as follows. (1) It neglects several other dimensions of human well-being, such as human rights, security, political participation etc. (Anand and Sen, 1992; Ranis *et al.*, 2005; Grimm *et al.*, 2008). (2) It implies and quantifies implied substitution possibilities between the three indices, for example, a decline in life expectancy can be offset by a rise in GDP per capita in ways some researchers found questionable (Kelley, 1991; Ravallion, 1997; Srinivasan, 1994; Grimm *et al.*, 2008; Herrero *et al.*, 2007; Sanusi, 2008). This scheme masks trade-offs between various dimensions since it suggests that you can make up in one dimension the deficiency in another. Such a reductionist view of human development is completely contrary to the UNDP's own definition (Sagar and Najam, 1998). (3) The HDI uses an arbitrary weighting scheme of the three components (Kelley, 1991; Ravallion, 1997; Srinivasan, 1994; Grimm *et al.*, 2008). Foster *et al.* (2003) argued that attaching equal values to the three-dimensions may blur the picture of human development within a country. (4) It only looks at the average achievements and, thus, does not take into account the distribution of human development within a country (Sagar & Najam, 1998; Grimm *et al.*, 2008). The first report admitted that "all three measures of human development suffer from a common failing: they are averages that conceal wide disparities in overall population" (UNDP, 1990, p. 12). Sagar and Najam (1998) discussed the international implications of the HDI formulation and how the UNDP calculations gloss over global inequities. More troubling from their perspective is the HDI's lack of serious treatment of inequities at the national level, while consistently paying lip-service to their importance. However, the HDI is today widely used in academia, in the media, and in policy circles to measure and compare progress in human development between countries and over time (Grimm *et al.*, 2008). Perhaps the single most powerful attribute of the human development concept is the centrality that it invests in the notion that each of its three dimensions is equally essential in determining the level of human development. In fact, the reports have made considerable effort to defend the decision of giving equal weight to the three variables, despite criticism in the literature (Sagar and Najam, 1998).

This paper focuses on disparities of human development index at sub-province level in Iran. The sub-provincial level analysis of HDI has a main advantage; it allows a better depiction of the nature of the inequality than analysis at more aggregated levels like provincial or national levels. This study also addresses two major criticisms on HDI: substitution possibilities between its three indices and its common application to calculate HDI in aggregated levels which may conceal wide regional disparities and blur the picture of human development within a country. In response to these shortcomings, this article is an attempt to evaluate HDI at sub-province level by applying a simple fuzzy classification of human development, which provides a fresh look at the existing regional development differences in Iran and reduces full substitutability of three components of HDI. Unfortunately, it is not possible to study previous trends of HDI at sub-province level in Iran; because, data about components of this index are not available for all sub-provinces for previous years.

Until the point of finalization of this research, the existence of any other research that evaluated HDI at sub-province level in Iran has not been determined. The rest of this paper is organized as follows. Section 2 presents the methodology of the paper and brief description of HDI. Evaluating human development level of sub-provinces of Iran and intraregional inequalities are discussed in section 3, and Conclusions are provided in last section.

MATERIALS AND METHODS

The basic idea of this study is to evaluate HDI at sub-province level in Iran and explore regional (sub-provincial) disparities of human development. This will allow us to get a clear idea of the heterogeneity and inequality in human development which exists within this country. The concept of a region in this research corresponds to the second subdivision level of Iran named sub-province or Shahrestan. A national survey involving all sub-provinces (336 sub-provinces) was conducted to obtain needed data. The study depends on primary data mainly collected from the detailed results of the last population and housing census (2006) and other related data published by Statistical Centre of Iran, and statistical yearbooks of provinces of Iran.

The HDI is calculated as follows: for two of the HDI's three components a transformed variable is derived from basic data. For the income component a log transformation is applied, in effect discounting higher incomes due to supposed diminishing marginal utility. For the educational component the transformed variable consists of two-thirds of the percentage rate of literate adults among all adults and one-third of the combined first-, second- and third-level educational gross enrolment ratio in per cent. The health/longevity component is directly measured by life expectancy at birth in years (Neumayer, 2001). For each variable a maximum and a minimum is defined. An index is then calculated as follows:

$$X \text{ index} = (\text{actual value} - \text{minimum value}) / (\text{maximum value} - \text{minimum value})$$

X = (Income, Health, Education).

$$\text{HDI} = (1/3) (\text{Income index} + \text{Health index} + \text{Education index}).$$

For each dimension, the value of the index is computed on a scale of 0–1 where 0 corresponds to the minimum, and 1 to the maximum assigned value for the corresponding indicator. The overall HDI is then determined as the arithmetic average of the three indices (Sagar and Najam, 1998); the HDI as well lies between zero and one and sub-provinces are ranked according to how close their HDI is to one (Neumayer, 2001). Communities with an HDI of less than 0.5 have low level of human development; those between 0.51 and 0.80 medium level and those above 0.80, high level (UNDP, 1997; Sanusi, 2008).

Heretofore, there has been a common approach to calculate HDI at aggregate levels in many countries. In this regard, it should be reminded that analysis of inequality at a very aggregate level might lead to bad conclusions (Cameron, 2002). In Iran, the HDI has been studied at most for province level. Analysis of provincial disparities of human development is necessary in the way of adopting national policies for integrated development, yet identifying the real needs of regions and determining development priorities call for studies on smaller geographical units of the country. In the absence of such studies, we cannot get clear idea of the development or backwardness of regions. So, this article attempts to explore sub-provincial disparities of human development throughout the country.

The other critique of the HDI is substitution possibilities between various dimensions. "If a country's level of human development depends upon progress on all three dimensions, then certainly a better strategy to estimate national HDIs would be through a product of the three component indices. In this scheme, a poor performance on any index would be reflected directly in the overall HDI and therefore good performance on the HDI would require good performance on all dimensions simultaneously" (Sagar and Najam, 1998, p. 251). We suggest that one way to restrict the substitutionary between three dimensions of HDI would be to use a fuzzy scale for determining the level of human development. We constructed fuzzy evaluation process as follows. First, we classified each component index of HDI into three levels according to UNDP's three class intervals including less than 0.5, between 0.51 and 0.80, and above 0.80. Each sub-province was putted in relevant intervals based on its performance on each component. Then, we defined simple fuzzy rules to determine final development level. Based on these rules, for example, if I_1 , I_2 and I_3 for a typical sub-province are less than 0.5, then its development level will be very low; now, if I_1 and I_2 are less than 0.5 and I_3 lies between 0.51 and 0.80, the development level will be low; so, one level improvement on each component will improve overall human development level as much as one level. In like manner, we can define 7 categories including: very high, high, medium-high, medium, low-medium, low and very low for determining the human development level. Table 1 presents our suggested fuzzy classification of human development level. In this classification, the status of each sub-province about each component is directly reflected in its human development level and substitution possibilities between three components of HDI are reduced considerably.

Table 1: Fuzzy classification of human development level.

HDI components			DL (development level)
I_1	I_2	I_3	
0.81-1.00	0.81-1.00	0.81-1.00	VH (Very high)
0.81-1.00	0.81-1.00	0.51-0.80	H (High)
0.81-1.00	0.81-1.00	0.00-0.50	MH (Medium-High)
0.81-1.00	0.51-0.80	0.51-0.80	MH (Medium-High)
0.81-1.00	0.51-0.80	0.00-0.50	M (Medium)
0.51-0.80	0.51-0.80	0.51-0.80	M (Medium)
0.81-1.00	0.00-0.50	0.00-0.50	LM (Low-Medium)
0.51-0.80	0.51-0.80	0.00-0.50	LM (Low-Medium)
0.51-0.80	0.00-0.50	0.00-0.50	L (Low)
0.00-0.50	0.00-0.50	0.00-0.50	VL (Very Low)

Results:

The overall results of HDI and fuzzy classification of development level (DL) of sub-provinces of Iran are shown in Table 2 where sub-provinces are sorted according to their rank in the HDI. Based on the results of this study, having higher HDI does not necessarily imply upper DL; for example, the HDI value of Shemiranat is higher than the values of Shiraz and Karaj, but its DL is lower. Similarly, there are several sub-provinces with higher HDI whose DL is lower than expected, and vice versa. In fact, full substitutability between the three components of HDI which is resulted from its additive nature misleads to some extent the actual human development level. So, we preferred to analyze human development level of sub-provinces based on aforementioned fuzzy classification rather than exact value of HDI. However, Both HDI and DL reveal very stark differences in human development among sub-provinces.

From among 336 sub-provinces of Iran, four sub-provinces including Tehran, Esfahan, Shiraz and Karaj are at very high level of development; only one sub-province (Shemiranat) lies in high level; 10, 114, 97, 82 and 28 sub-provinces lie at the levels of medium-high, medium, low-medium, low and very low level, respectively. It is rather disturbing to see a large number of sub-provinces in lower levels of development; so that, 207 sub-provinces equivalent to 61.6% of all sub-provinces of Iran are placed in three lower classes i.e. low-medium, low and very low. It is also notable that all 10 sub-provinces constituting the province of Sistan & Baluchestan (located in the southeastern region of Iran) are highly backward in respect of all development indices. Figure 1 presents the spatial distribution of the sub-provinces of Iran by DL classes. It reveals that a number of low and very low level sub-provinces are located in border provinces. These regions suffer from underdevelopment compared with other parts of Iran. According to the results of this study, highly backward sub-provinces including Sarbaz, Neekshahr, Zahak, Saravan, Iranshahr, Konarak, Khash, Jask, Chabahar, Salas-e-Babajani, Lali, Sarvabad, Zabol, Oshnaviyeh, Chaldoran, Ghaleh-Ganj, Ijerud, Shirvan & Chardavel, Mahneshan, Dalahu, Faruj, Kalat, Gilan-e-Gharb, Shahindezh, Zahedan, Javanrud, Manujan and Ramyan should be given high priority in an attempt to assist them to attain higher level of development.

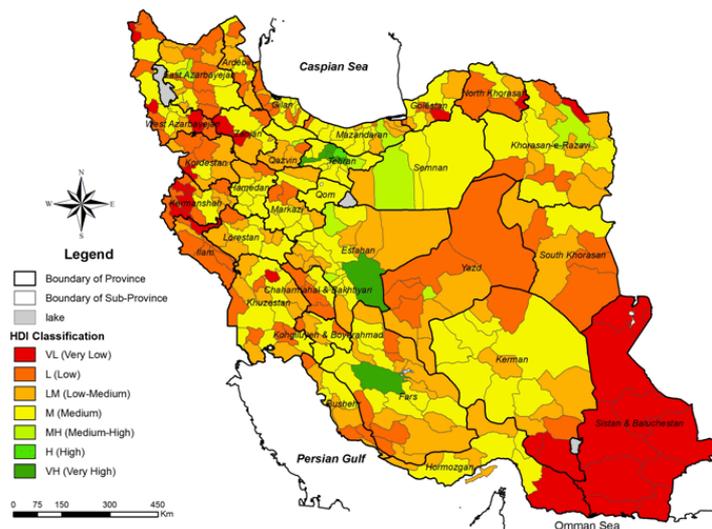


Fig. 1: Classification of the sub-provinces of Iran by Development Level (DL).

When examining the individual components, it becomes clear that the highest difference among sub-provinces is in the income component. The difference in education among sub-provinces is also sizable, but smaller than in the income index. The difference in life-expectancy is also substantial, but generally the smallest of the three components. However, there are significant regional development inequalities in Iran in respect of different components of human development. To accelerate the process of convergence and to reduce intraregional and interregional disparities, particular importance should be attached to improve development components in backward regions.

Table 2: HDI (Human Development Index), R (Rank) and DL (Development Level) of sub-provinces of Iran.

Sub-province	HDI	R	DL	Sub-province	HDI	R	DL	Sub-province	HDI	R	DL
Tehran	0.969	1	VH	Rafsanjan	0.623	57	M	Lamerd	0.563	113	LM
Esfahan	0.881	2	VH	Babolsar	0.623	58	M	Torbat-e-Jam	0.562	114	M
Shemiranat	0.878	3	H	Jahrom	0.622	59	M	Farsan	0.561	115	LM
Shiraz	0.857	4	VH	Mahallat	0.620	60	M	Azarshahr	0.560	116	M
Karaj	0.846	5	VH	Behbahan	0.617	61	M	Ajabshir	0.559	117	LM
Semnan	0.775	6	MH	Savojbolagh	0.617	62	M	Kangavar	0.559	118	LM
Damavand	0.770	7	MH	Garmsar	0.616	63	LM	Bafgh	0.558	119	LM
Tabriz	0.758	8	MH	Falavarjan	0.614	64	M	Miyaneh	0.558	120	M
Sari	0.757	9	MH	Boyerahmad	0.614	65	M	Gonabad	0.557	121	M
Yazd	0.757	10	MH	Bandar Anzali	0.613	66	MH	Quchan	0.556	122	M
Kashan	0.737	11	MH	Gonbad-e-Kavus	0.613	67	M	Fariman	0.556	123	LM
Najafabad	0.733	12	M	Sabzevar	0.609	68	M	Andimeshk	0.556	124	LM
Ahvaz	0.724	13	M	Malayer	0.608	69	M	Kangan	0.555	125	LM
Mashhad	0.717	14	MH	Torkaman	0.606	70	M	Nahavand	0.555	126	M
Alborz	0.705	15	MH	Lahijan	0.604	71	M	Firuzabad	0.552	127	M
Khomeinishahr	0.703	16	M	Semirom-e-Sofla	0.604	72	M	Mahabad	0.552	128	M
Arak	0.702	17	M	Fasa	0.602	73	M	Meybod	0.552	129	L
Amol	0.699	18	M	Abhar	0.601	74	M	Sepidan	0.552	130	LM
Babol	0.692	19	M	Kermanshah	0.601	75	M	Behshahr	0.552	131	LM
Qaemshahr	0.687	20	M	Nazarabad	0.598	76	M	Sarab	0.551	132	M
Lenjan	0.687	21	MH	Borujen	0.597	77	M	Eqlid	0.551	133	M
Hamedan	0.686	22	M	Abadan	0.597	78	LM	Tuyserkan	0.551	134	M
Qazvin	0.679	23	M	Estahban	0.597	79	LM	Jolfa	0.550	135	LM
Rasht	0.678	24	M	Borujerd	0.595	80	M	Larestan	0.549	136	LM
Kerman	0.676	25	M	Maragheh	0.593	81	M	Omidiyeh	0.547	137	L
Eslamshahr	0.674	26	M	Khansar	0.592	82	M	Langrud	0.546	138	M
Rey	0.672	27	M	Jiroft	0.592	83	M	Shazand	0.546	139	M
Tonkabon	0.672	28	M	Ardebil	0.591	84	M	Khorramdarreh	0.545	140	LM
Qom	0.670	29	M	Genaveh	0.591	85	LM	Shabestar	0.545	141	M
Mobarakeh	0.664	30	M	Tiran & Karvan	0.590	86	LM	Qayenat	0.544	142	M
Bushehr	0.662	31	M	Orumiyeh	0.590	87	M	Mamasani	0.544	143	M
Neyshabur	0.660	32	M	Shahr-e-Babak	0.589	88	M	Mahmoudabad	0.543	144	LM
Gorgan	0.660	33	M	Khomein	0.589	89	M	Shushtar	0.541	145	LM
Chalus	0.656	34	M	Sanandaj	0.587	90	M	Kohgiluyeh	0.540	146	LM
Borkhar & Meymeh	0.655	35	M	Dashtestan	0.586	91	M	Aligudarz	0.539	147	M
Damghan	0.653	36	M	Abadeh	0.586	92	LM	Baft	0.538	148	M
Shahr-e-Kord	0.653	37	M	Naeen	0.585	93	LM	Naqadeh	0.538	149	M
Noshahr	0.652	38	M	Bandar Lengeh	0.585	94	M	Khalkhal	0.538	150	LM
Shahrud	0.651	39	M	Rudbar	0.585	95	M	Tabas	0.537	151	L
Shahriar	0.649	40	M	Pakdasht	0.582	96	M	Fereydunshahr	0.537	152	LM
Firuzkuh	0.648	41	M	Torbat Heydariyeh	0.582	97	M	Khatam	0.536	153	LM
Bandar Abbas	0.645	42	M	Birjand	0.581	98	LM	Bahar	0.536	154	M
Khorramabad	0.644	43	M	Khoy	0.580	99	M	Masjed Soleyman	0.536	155	M
Varamin	0.643	44	M	Ramhormoz	0.580	100	M	Natanz	0.531	156	LM
Gachsaran	0.642	45	M	Zanjan	0.580	101	M	Kuhdasht	0.530	157	LM
Kazerun	0.641	46	M	Khorramshahr	0.579	102	M	Bonab	0.530	158	M
Robatkarim	0.640	47	M	Nur	0.577	103	M	Neyriz	0.530	159	LM
Dezful	0.636	48	M	Rudsar	0.576	104	M	Dashti	0.529	160	LM
Golpayegan	0.636	49	M	Miandoab	0.574	105	M	Parsabad	0.528	161	M
Aran & Bidgol	0.633	50	M	Abumusa	0.574	106	M	Sarakhs	0.528	162	LM
Marvdasht	0.632	51	M	Bojnurd	0.572	107	M	Bardsir	0.526	163	LM
Zarand	0.630	52	M	Darab	0.571	108	M	Sumaehsara	0.526	164	M
Shahreza	0.629	53	M	Ferdows	0.568	109	LM	Chadegan	0.526	165	LM
Sirjan	0.626	54	M	Minab	0.567	110	M	Delijan	0.525	166	LM
Bandar-e-Mahshahr	0.626	55	M	Astara	0.566	111	LM	Izeh	0.525	167	LM
Saveh	0.623	56	M	Faridan	0.565	112	LM	Mehriz	0.524	168	LM

Table 2: HDI (Human Development Index), R (Rank) and DL (Development Level) of sub-provinces of Iran-Continued.

Sub-province	HDI	R	DL	Sub-province	HDI	R	DL	Sub-province	HDI	R	DL
Astane Ashrafiyeh	0.523	169	M	Kamyaran	0.485	225	LM	Mah-Velat	0.441	281	L
Asadabad	0.523	170	M	Tafresh	0.484	226	L	Divandarreh	0.441	282	L
Ramsar	0.522	171	L	Jajarm	0.484	227	L	Masal	0.441	283	L
Malekan	0.522	172	LM	Salmas	0.484	228	L	Zahedan	0.439	284	VL
Osku	0.521	173	L	Aliabad	0.484	229	LM	Pasargad	0.438	285	L
Taybad	0.521	174	LM	Takestan	0.482	230	LM	Tarom	0.437	286	L
Kashmar	0.520	175	LM	Darrehshahr	0.482	231	L	Jam	0.436	287	L
Ilam	0.520	176	LM	Esfarayen	0.480	232	L	Eslamabad-e-Gharb	0.435	288	L
Savadkuh	0.520	177	LM	Ravar	0.480	233	L	Qasr-e-Shirin	0.433	289	L
Zarrindasht	0.519	178	LM	Takab	0.479	234	L	Shahindezh	0.432	290	VL
Bastak	0.519	179	LM	Bijar	0.478	235	LM	Tavalesh	0.431	291	L
Minudasht	0.519	180	M	Neka	0.477	236	LM	Varzaqan	0.431	292	L
Ardakan	0.518	181	L	Lordegan	0.477	237	L	Ashtian	0.427	293	LM
Ardestan	0.518	182	LM	Bostanabad	0.476	238	L	Dasht-e-Azadegan	0.426	294	L
Tangestan	0.518	183	LM	Kaleibar	0.476	239	L	Sarayan	0.425	295	L
Khorrambid	0.518	184	L	Bardekan	0.476	240	L	Piranshahr	0.425	296	L
Azna	0.517	185	LM	Siahkal	0.475	241	L	Deylam	0.425	297	L
Rudan	0.516	186	M	Namin	0.475	242	L	Azadshahr	0.421	298	L
Arsanjan	0.515	187	LM	Razan	0.474	243	L	Kowsar	0.419	299	L
Rezvanshahr	0.514	188	LM	Khalil Abad	0.473	244	LM	Bahmaee	0.415	300	L
Chenaran	0.514	189	LM	Anbarabad	0.473	245	LM	Shadegan	0.412	301	L
Zarandiyeh	0.513	190	LM	Kabudarahang	0.473	246	LM	Gilan-e-Gharb	0.407	302	VL
Khodabandeh	0.513	191	LM	Hendijan	0.472	247	LM	Abdanan	0.406	303	L
Qeshm	0.512	192	LM	Ardal	0.472	248	L	Ramshir	0.398	304	L
Abyek	0.512	193	L	Rashtkhar	0.470	249	L	Dehloran	0.395	305	L
Bukan	0.512	194	LM	Bandar Gaz	0.469	250	L	Sardast	0.394	306	L
Abarkuh	0.512	195	LM	Juybar	0.468	251	L	Sarbisheh	0.393	307	L
Shirvan	0.511	196	LM	Ravansar	0.467	252	LM	Kalat	0.391	308	VL
Qirokarzin	0.511	197	LM	Dayyer	0.466	253	L	Faruj	0.391	309	VL
Dorud	0.510	198	LM	Ahar	0.466	254	LM	Dalahu	0.386	310	VL
Galugah	0.510	199	LM	Sonqor	0.466	255	L	Mahneshan	0.375	311	VL
Kahnuj	0.509	200	LM	Shaft	0.465	256	L	Marivan	0.374	312	L
Hashtrud	0.508	201	L	Nahbandan	0.465	257	L	Shirvan & Chardavel	0.371	313	VL
Kordkuy	0.507	202	LM	Kohbonan	0.464	258	LM	Charoimaq	0.366	314	L
Khamir	0.507	203	LM	Fuman	0.462	259	L	Kuhrang	0.366	315	L
Semiroom	0.506	204	LM	Taft	0.462	260	L	Ijerud	0.366	316	VL
Sadugh	0.505	205	L	Bilehsavar	0.462	261	L	Nir	0.362	317	L
Dargaz	0.505	206	L	Maku	0.461	262	L	Ghaleh-Ganj	0.362	318	VL
Bavanat	0.504	207	LM	Ramyan	0.461	263	VL	Maneh and Samalqan	0.361	319	L
Harsin	0.503	208	LM	Gavbandi	0.459	264	LM	Rudbar-e-Jonub	0.358	320	L
Poldokhtar	0.499	209	LM	Dena	0.457	265	L	Chaldoran	0.354	321	VL
Selseleh	0.499	210	LM	Gotvand	0.457	266	L	Oshnaviyeh	0.352	322	VL
Garmi	0.498	211	LM	Amlash	0.456	267	L	Zabol	0.351	323	VL
Baneh	0.497	212	LM	Sar-e-pol-e-Zahab	0.455	268	L	Sarvabad	0.347	324	VL
Sahneh	0.497	213	LM	Komeijan	0.453	269	L	Lali	0.346	325	VL
Boyinzahra	0.496	214	LM	Delfan	0.452	270	L	Salas-e-Babajani	0.334	326	VL
Shush	0.495	215	LM	Farashband	0.451	271	L	Mehran	0.329	327	L
Mohr	0.495	216	L	Darmiyan	0.449	272	L	Chabahar	0.295	328	VL
Qorveh	0.493	217	LM	Paveh	0.447	273	L	Jask	0.276	329	VL
Meshkinshahr	0.491	218	LM	Manujan	0.447	274	VL	Khash	0.231	330	VL
Baghmalek	0.490	219	LM	Javanrud	0.446	275	VL	Konarak	0.151	331	VL
Marand	0.490	220	LM	Khonj	0.446	276	L	Iranshahr	0.145	332	VL
Khaf	0.489	221	LM	Haris	0.445	277	L	Saravan	0.094	333	VL
Hajiabad	0.489	222	LM	Aq Qala	0.443	278	L	Zahak	0.094	334	VL
Bam	0.487	223	LM	Ivan	0.443	279	L	Neekshahr	0.084	335	VL
Kalaleh	0.486	224	LM	Saqgez	0.443	280	L	Sarbaz	0.031	336	VL

Conclusion:

Regional disparities of human development within many developing countries are cited as reasons for growing social unrests, political instabilities, and disintegration. Measuring development level of regions in the status quo is prerequisite for adopting efficient policies for integrated regional and national development. In this way, Human Development Index (HDI) is one of the widely used methods to measure human development of regions and countries. The aim of this study was to investigate regional disparities of human development in Iran. Meanwhile calculating HDI, this paper addressed two criticisms on HDI including substitution

possibilities between its three indices and its common application at aggregated levels. For solving these criticisms, this paper defined a simple set of fuzzy rules to determine the development level (DL) in Iran at sub-province level. Fuzzy classification considerably reduces the substitution possibilities between individual components and directly reflects the effect of each development component on overall DL, and analyzing human development at sub-province level reveals interregional and intraregional disparities of Iran more precisely.

Both HDI and DL showed a clear unevenness among sub-provinces. Based on the results of this study, having higher HDI does not necessarily imply upper DL; for example, the HDI of Shemiranat is higher than Shiraz and Karaj, but its DL is lower. Similarly, there are several sub-provinces with higher HDI whose DL is lower than expected, and vice versa. From among 336 sub-provinces of Iran 4, 1, 10, 114, 97, 82 and 28 sub-provinces lie in the levels of very high, high, medium-high, medium, low-medium, low and very low level, respectively.

The present analysis highlights the fact that in spite of Iran's regional policy based on reducing the development gap between different regions and creating a relative balance in regional development, yet this country suffers from uneven development across different regions. So, it is necessary to reduce regional disparities in Iran to pave way for greater national integration, increase in economic growth and political stability. To achieve regional development all over the country, a balanced and continuing improvement of different components of development is needed, especially in more backward sub-provinces. Lower level sub-provinces require considerable attention and efforts to enable them to come out of their chronic backwardness. However, reduction in human development disparities in Iran is a long-term process calling for a perspective plan with the twin objective of sustaining the present level of development in the developed sub-provinces and promoting relative growth of backward sub-provinces.

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