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CORRELATES OF HUMAN DEVELOPMENT INDEX IN LOW, MEDIUM, HIGH AND VERY HIGH HUMAN DEVELOPED NATIONS

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Abstract. Now days, Human Development Index (HDI) has turned into an orthodox symbol for regional and national growth of a country as well as the widely used multidimensional welfare measure. A yearly ranking of 188 associated countries on HDI in human development report published by United Nations is a zealously awaited episode that gets significant media attention and public response. Unfortunately, many developing countries still consider GDP or wealth as an indicator for its economic and social growth and focused only on its development while developed countries focused on the development and well-being of their public in terms of their better education and quality of life. In present research, correlates of HDI were explored in very high, high, medium and low human development countries and the findings of the research will be beneficial for the policy makers to keep concentrate on the associated factors with HDI in order to increase the human development index of their country e.g., life expectancy at birth, women empowerment, average years of schooling for male, public health expenditures, public expenditures on education, total tax revenues, research & development expenditures, taxes on income, profit & capital gain, domestic credit provided by financial sector, labour force participation rate, employment to population ratio, private capital flows, net

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migration rate, international student mobility and unemployment benefits recipients are positively associated with human development index in very high human development index countries. In addition, factors that are inversely related with HDI in very high human development index nations are average annual GDI growth, female & male adult mortality rate, external debt stock, total debt service, infant's mortality due to outdoor pollution, employment in agriculture, youth unemployment, male & female domestic workers and child labour.

Keywords: Human development index, GDP, Life expectancy, Quality of Life, Human inequality

JEL classification: O15, E01, D63

I. INTRODUCTION

Now a day, human development index (HDI) is used as a sign for fiscal and societal progress of a country as earlier GDP serves the purpose [Mariano et al., 2015]. In spite of the fact that financial development, expanding exchange and speculation, innovative progress - are critical, yet advancement prepares tend to concentrate on more individuals instead of simple monetary development of any country or state altogether [Atkinson et al., 2016]. Along these lines, center has moved to human development (HD), which is about individuals, about growing their decisions to live full and innovative lives with flexibility and poise. The idea of human development has wide acknowledgment among academicians, analysts, organizers, decision makers and is similarly acknowledged among developing and developed nations (Madan, 2012).

In addition, high GDP of a country does not ensure the good quality of life and social development in the country as GDP is certainly just a single component of one's life that upgrades financial prosperity [Chatterjee, 2005]. Consequently, for cross country comparisons per capita income will be misleading as a meter of well-being across the diverse societies [Foster et al., 2005]. This has been explicitly perceived and is surely the method of reasoning behind the advancement of more powerful measures of prosperity, for example, e.g. the Human Development Index (HDI) of the United Nations [UNDP, 1990].

HDI is ascertained on the premise of three elements life span, access to information and way of life [UNDP, 1990] The HDI serves as a reference tool for both social and monetarist advancement. It is an instrument used for checking long haul advance in a nation's normal level of human improvement in three fundamental measurements: an elongated and sound lifespan, access to information and a respectable way of life. The HDI was acquainted in 1990 with stress that individuals and their abilities ought to be definitive criteria for surveying the improvement of a nation, not simply monetary development. The incorporation of education and wellbeing markers is an indication of fruitful government approaches in giving access to vital legitimacy merchandise, for example, human services, sanitation and education [UNDP, 2015].

It might be brought up that HDI is not the primary endeavor to swap the per capita GNP [Hou et al., 2015; Ustubici, 2012]. Actually, a prior endeavor to total three human markers (literacy, infant mortality and life expectancy at year one) into a solitary list is the Physical Quality of Life (Chawdhary, 1991; Morris, 1979; Stewart, 2006). This method includes the quantity of life but not the quality of life. Moreover infant mortality and life expectancy are highly correlated variables [Murray, 1988]. In contrary to this, HDI covers all these issues and embrace the quantitative as well as qualitative aspects of life [Rodionova & Gordeeva, 2010]. To achieve the economic growth any country must need to set a threshold of human development as a prerequisite because it determines the consistent growth for society.

The United Nations classifies countries as having a low, medium, high or very high human development index (UNDP 2014). These countries have different infrastructure, political system, social development and many other factors that might affect directly or indirectly human development in the country. In present study, we explore the possible associated factors of HDI among high developed nations to low developed nation. The outcomes of the study will be helpful for the low developed nations to identify the shortcomings in their policies that obstacle them to be in among the high developed nations. By concentrating on the factors associated with higher HDI low developed nations can improve human development index.

II. MATERIALS AND METHODS

The data used in the present research was a secondary data obtained from United Nations Development Report published in 2015 (UNDP 2015). The primary variable of interest was HDI that quantifies human development by taking literacy rate and school enlistment as a measure of knowledge, life expectancy as a tool of long and healthy life, furthermore, per capita GDP in view of buying force equality as a measure of material richness level. So HDI was comprised of three components; longevity, education level and decent standard of living. These three components were computed as:

$$\text{Longevity} = \text{Life Expectancy Index(LEI)} = \frac{\text{Life Expectancy} - \text{Life Expectancy}_{min}}{\text{Life Expectancy}_{max} - \text{Life Expectancy}_{min}} \quad (2.1)$$

$$\text{Education Index(EI)} = \frac{2}{3} * \left(\frac{\text{Adult Literacy} - \text{Adult Literacy}_{min}}{\text{Adult Literacy}_{max} - \text{Adult Literacy}_{min}} \right) + \frac{2}{3} * \left(\frac{\text{Enrollment} - \text{Enrollment}_{min}}{\text{Enrollment}_{max} - \text{Enrollment}_{min}} \right) \quad (2.2)$$

$$\text{GDP Index (GDPI)} = \frac{\ln(\text{GDP}) - \ln(\text{minimum GDP})}{\ln(\text{maximum GDP}) - \ln(\text{minimum GDP})} \quad (2.3)$$

HDI is simply the average of (2.1), (2.2) and (2.3) i.e.,

$$\text{HDI} = \frac{\text{LEI} + \text{EI} + \text{GDPI}}{3} \quad (2.4)$$

In present data HDI was calculated from 188 countries (very high 49, high 56, medium 39 & low 44) and the classifications of HDI were based on the quartiles of the HDI distribution. For low human development countries HDI was below 0.550; medium human development 0.550-0.699; high human development 0.700-0.799 and for very high human development countries value of HDI was atleast 0.800. Pearson and Spearman's correlation coefficient were used to measure the relationship between HDI and other factors in low human development countries – very high human development countries. All the data were analyzed in SPSS v 24.

III. RESULTS AND DISCUSSION

HUMAN DEVELOPMENT INDEX AND ITS CONSTITUENTS

Life expectancy at nascence is the numeral years of a neonatal who might live when usual forms of age-specific mortality rates at the time of nascence prevail in a similar fashion and has high significant positive relationship with HDI in very high human development index countries ($r = 0.720$, $p<0.01$); significant positive relationship ($r = 0.327$, $p<0.05$) in low HDI countries while no significant relationship in high HDI and low HDI countries exist. Estimated years of schooling is the amount of years of education that a kid of school entering age can presume to have when usual forms of age-specific admission rates and has highly significant positive relationship with HDI ($p<0.01$) in all four classifications of HDI countries. Mean years of schooling is the average amount of years of schooling taken by individuals of ages 25 and older, transformed from education accomplishment stages spending certified intervals of each level and found highly significantly positively related with HDI in very high human development countries ($r = 0.661$, $p<0.01$) followed by medium human development countries ($r = 0.639$, $p<0.01$), low HDI countries ($r = 0.607$, $p<0.01$) and high human development countries ($r = 0.442$, $p<0.01$). Gross national income (GNI) per capita is the collective sources of an economy spawned by its making and its possession of elements of production, minus the expenditures on aspects of production possessed by the rest of the world also has significant positive relationships ($p<0.01$) with HDI in all the four types of human development countries. HDI is inversely significantly related with average annual GDI growth (2010-2014) in only very high human development countries.

TABLE 1

Correlations of HDI and its constituents

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Life expectancy at birth (years)	0.720^{**}	0.145	0.198	0.327^{*}
Expected years of schooling	0.543^{**}	0.342^{**}	0.448^{**}	0.574^{**}
Mean years of schooling	0.661^{**}	0.442^{**}	0.639^{**}	0.607^{**}

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Gross national income (GNI) per capita	0.516**	0.682**	0.587**	0.670**
Average annual GDI growth (%, 2010-2014)	-0.293*	0.103	-0.131	-0.032

HUMAN DEVELOPMENT INDEX AND FACTORS RELATED TO INEQUALITY-ADJUSTED HUMAN DEVELOPMENT

Coefficient of human imbalance is a normal disparity in three fundamental measurements of human advancement and found inversely significantly ($p<0.05$) related with HDI in high and medium human development countries. Inequality in life probability is the imbalance in conveyance of expected length of life in view of information from life tables assessed utilizing the Atkinson disparity record and is also significantly related with HDI in all four types of HD countries. Inequality in education is an imbalance in appropriation of years of education in view of information from family unit studies evaluated utilizing the Atkinson disparity index and has significant ($p<0.05$) adverse effects on HDI in medium HD countries. Inequality in income is an imbalance in wage conveyance in view of information from family unit studies evaluated utilizing the Atkinson imbalance record and has no significant relations with HDI across all the types of HD countries.

TABLE 2

Correlations of HDI and Factors related to Inequality-adjusted Human Development

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Coefficient of Human Inequality	-0.109	-0.271*	-0.350*	-0.294
Inequality in Life Expectancy (%)	-0.565**	-0.421*	-0.404*	-0.531**
Inequality in education (%)	-0.053	-0.185	-0.317*	-0.196
Inequality in income (%)	-0.022	-0.204	-0.146	0.093
Income Inequality (Gini coefficient)	0.073	0.003	0.150	0.035

HUMAN DEVELOPMENT INDEX AND GENDER DEVELOPMENT

Gender Development Index is a ratio of female to male HDI observations and has no significant relationships with HDI in all four types of HD countries. Life expectancy at birth (years) for female is highly significantly ($r = 0.533$, $p<0.01$) related with HDI in very high human development countries followed by low HD countries ($r =0.326$, $p<0.05$) and high HD countries ($r = 0.316$, $p<0.05$) while life expectancy at birth (years) for male is positively significantly related with HDI in very high ($r = 0.657$, $p< 0.01$) and low ($r = 0.323$, $p< 0.05$) HD countries. Expected years of schooling for female is highly significantly related with very high and low HD countries while it is significantly related with HDI in high HD countries and has no significant relation in medium HD countries. Mean years of schooling both for male and female are positively significantly associated with HDI in all four types of HD countries. Although estimated gross national income per capita for both female and male are significantly associated with HDI in all HDI category countries but comparatively female gross per capita income is strongly correlated with HDI than male in very high and high HD countries while this factor among male has stronger association than female in low and medium development nations. Gender inequality index is also inversely related with HDI in very high and low HD countries. Shares of women seats in parliament is strongly positively associated ($r = 0.441$, $p<0.01$) with HDI in very high human development nations.

TABLE 3

Correlations of Human Development Index and Gender Development

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Gender Development Index	-0.071	0.079	0.230	0.169
Life expectancy at birth (Years) for Female	0.553**	0.316*	0.283	0.326*
Life expectancy at birth (Years) for Male	0.657**	0.096	0.183	0.323*
Expected Years of Schooling for Female	0.437**	0.328*	0.312	0.410**
Expected Years of Schooling for Male	0.585**	0.344**	0.198	0.293
Mean Years of Schooling for Female	0.556**	0.266*	0.440**	0.495**

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Mean Years of Schooling for Male	0.592**	0.306*	0.416**	0.458**
Estimated gross national income per capita (Female)	0.632**	0.454**	0.359*	0.639**
Estimated gross national income per capita (Male)	0.452**	0.449**	0.574**	0.642**
Gender Inequality Index	-0.561**	-0.228	-0.053	-0.393**
Representation of women in parliament (%)	0.441**	0.112	0.111	0.066

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND POPULATION TRENDS

Population size has no significant relationships with HDI in all four categories of HD countries. Average annual population growth rate is inversely significantly related with HDI in low ($r = -0.394$, $p<0.01$) and medium ($r = -0.383$, $p<0.05$) HD countries and has no significant relationships in very high or high human development countries. Urban population (%) is only positively associated ($r= 0.395$, $p<0.05$) with HDI in medium HD countries. Median age (years) is positively related with HDI in high ($r = 0.445$, $p< 0.01$), medium ($r = 0.423$, $p< 0.01$) and low ($r = 0.465$, $p< 0.01$) HD countries. Early age dependence ratio is a proportion of the populace ages 0–14 to the populace ages 15–64, communicated as the quantity of dependents per 100 individuals of working age (ages 15-64) and has inverse effects on HDI in high ($r = -0.459$, $p< 0.01$), medium ($r = -0.418$, $p< 0.01$) and low ($r = -0.501$, $p< 0.01$) HD countries while for the dependency ratio (old age: 65 and above) is significantly positively related with HDI in all four types of HD countries. Total fertility rate is the quantity of minors that would be destined to a lady if she somehow managed to alive till the end of her fertility years and bear kids at every age as per age-specific prolificacy rates and has negative significant impact over HDI in low, medium and high HD countries.

TABLE 4

Correlations of HDI and Population Trends

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Population (Millions)	0.247	0.149	0.128	0.261
Average Annual Population Growth Rate (%)	0.213	-0.135	-0.383*	-0.394**
Urban Population (%)	0.154	0.207	0.395*	0.087
Median Age (Years)	0.183	0.445**	0.423**	0.465**
Dependency ratio (per 100 person ages 15-64)/(per 100 person ages 15-64)	0.067	-0.459**	-0.418**	-0.501**
Dependency ratio (per 100 person ages 15-64)/(old age ≥ 65)	0.316*	0.341*	0.378*	0.313*
Total fertility rate (births per woman, 2010/2015)	-0.009	-0.304*	-0.410*	-0.582*

* $p<0.05$; ** $p<0.01$

HUMAN DEVELOPMENT INDEX AND HEALTH OUTCOMES

Infants lacking immunization against DPT is the rate of surviving babies who did not received their principal dosage of pertussis, diphtheria, and tetanus vaccine and has no association with HDI in any category of HDI country while infants lacking immunization measles is significantly inversely related ($r = -0.401$, $p<0.05$) with HDI in medium HDI countries. Infants mortality rate also has significant adverse effects on HDI in very high ($r = -05.40$, $p<0.01$), high ($r = -0.361$, $p<0.01$), medium ($r = -0.419$, $p<0.01$) and low ($r = -0.356$, $p<0.05$) human development indexed countries. Similar fashion is observed between HDI and under five years mortality rates. Child malnutrition is not significantly related with HDI in very high, high and low HD countries while significantly associated in medium HD countries. Gender wise mortality rate is significantly inversely related with HDI in only very high HD countries. Life expectancy at age 60 has positive significant ($p<0.01$) impact over HDI in very high and low HD countries. No of physicians is also positively significantly related with HDI in high, medium and low HD countries. In addition, public health expenditures are significantly ($r = 0.412$, $p<0.01$) positively related with HDI in only very high human development indexed countries.

TABLE 5

Correlations of HDI and Heath Outcomes

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Infants lacking immunization DTP (% of 1-year olds)	0.005	0.019	-0.236	-0.276
Infants lacking immunization Measles (% of 1-year olds)	0.171	0.081	-0.401*	-0.292
Infants mortality rates (per 1,000 live births)	-0.504**	-0.361**	-0.419**	-0.356*
Under-five years mortality rates (per 1,000 live births)	-0.523**	-0.365**	-0.435**	-0.398**
Child malnutrition (% under age 5)	-0.268	-0.178	-0.364*	-0.240
Female Adult mortality rate (per 1,000 people)	-0.394**	-0.126	-0.243	-0.260
Male Adult mortality rate (per 1,000 people)	-0.450**	0.208	0.094	-0.197
Life expectancy at age 60 (Years)	0.655**	-0.040	-0.043	0.402**
Physicians (per 10,000 people)	0.162	0.459**	0.450**	0.548**
Public health expenditure (% of GDP)	0.412**	0.056	0.080	-0.133

* $p<0.05$; ** $p<0.01$

HUMAN DEVELOPMENT INDEX AND EDUCATION ACHIEVEMENTS

Population with atleast some secondary education is significantly positively associated with HDI in very high ($r = 0.344$, $p<0.05$), medium ($r = 0.462$, $p<0.01$) and low ($r = 0.303$, $p<0.05$) human developed countries. Pre-primary gross enrollment ratio has significant impact on HDI in low ($r = 0.619$, $p<0.01$) HD countries followed by very high ($r = 0.334$, $p<0.05$) HD countries while primary gross enrollment ratio has positive relation in low HD countries and negative relation in medium HD countries. Secondary gross enrollment ratio also has positive relations with HDI in very high ($r = 0.326$, $p<0.05$), medium ($r = 0.489$, $p<0.01$) and low ($r = 0.494$, $p<0.01$) human developed countries. In addition, tertiary gross enrolment ratio is also positively related with HDI in all four types of HD countries. Primary school dropout ratio is inversely related with HDI in very high ($r = -0.451$, $p<0.01$), high (r =

0.288, $p<0.05$) and medium ($r = -0.610$, $p<0.01$) human development countries. Number of teacher-student ratio in primary school is negatively significantly related with HDI in low and medium HD countries group. Public expenditures on education (% of GDP) also have significant ($r = 0.414$, $p<0.01$) relation with HDI in only very high HD countries.

TABLE 6

Correlations of HDI and Education Achievements

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Population with atleast some secondary education (% ages ≥ 25)	0.344*	0.196	0.462**	0.303*
Pre-primary gross enrollment ratio (% pre-school age children)	0.334*	0.208	0.179	0.619**
Primary gross enrollment ratio (% primary school age population)	0.031	-0.159	-0.371*	0.318*
Secondary gross enrollment ratio (% secondary school age population)	0.326*	0.250	0.489**	0.494**
Tertiary gross enrollment ratio (% tertiary age population)	0.283*	0.375**	0.472**	0.368*
Primary school dropout ratio (% of primary school cohort)	-0.451**	-0.288*	-0.610**	-0.153
Primary school pupil-teacher ratio (no. of pupils per teacher)	-0.042	-0.249	-0.525**	-0.346*
Public expenditure on education (% of GDP)	0.414**	-0.093	0.055	0.144

* $p<0.05$; ** $p<0.01$

HUMAN DEVELOPMENT INDEX AND NATIONAL INCOME & COMPOSITION OF RESOURCES

Gross domestic product (GDP) is the aggregate of gross esteem included by every single inhabitant maker in the economy in addition to any item assessments and short any appropriations excluded in the estimation of the items, communicated in 2011 global dollars utilizing buying power equality rates and has positive significant relation with HDI in very high ($r = 0.396$, $p<0.01$) and low ($r = 0.311$, $p<0.05$) HD

countries. GDP per capita is a GDP in a specific tenure isolated by the aggregate populace for a similar period and has significant positive relation with HDI in all the four type of HD countries. Gross fixed capital formation is an estimation of procurements of novel or standing settled resources by the corporate area, administrations and family units (barring their independent ventures) minus transfers of settled resources, communicated as a rate of GDP and has no significant relation with HDI across all the categories of HDI countries. General government closing consumed spending is the entirely administration current consumptions for buys of merchandise and enterprises (counting pay of workers and most uses on national safeguard and security yet barring government military uses that are a piece of government capital arrangement), communicated as a rate of GDP and has no association with HDI. Total tax revenue is the aggregate necessary exchanges to the focal government for open dedications, communicated as a rate of GDP and is significantly positively associated ($r = 0.303$, $p<0.05$) with HDI in only very high human development countries. Taxes on income, profit and capital gain are the duties demanded on the genuine or hypothetical net wage of people, on the benefits of companies and undertakings and on capital increases, whether acknowledged or not, ashore, securities and different resources; and are significantly positively associated ($r = 0.625$, $p<0.01$) with HDI in only very high human development countries. Research and development expenditures are the present and capital uses (both private and public) on inventive work embraced efficiently to expand information and the utilization of learning for new solicitations, communicated as a rate of GDP. This factor also has significant positive impact on HDI in very high ($r = 0.632$, $p<0.01$), high ($r = 0.360$, $p<0.01$) and medium ($r = 0.379$, $p<0.05$) HD countries. Domestic credit provided by financial sector is a worthy representative for different areas on a gross premise (aside from credit to the focal government, which is net), communicated as a rate of GDP and is significantly positively associated ($r = 0.563$, $p<0.01$) with HDI in very high human development countries only. External debt stock is an obligation owed to out-of-state people repayable in remote cash, products or administrations, communicated as a rate of gross national income (GNI) and is inversely related ($r = -0.350$, $p<0.05$) with HDI in very high human development nations. Total debt service: Totality of foremost reimbursements and intrigue really paid in outside coin, products or administrations on long haul obligation; intrigue

paid on fleeting obligation; and reimbursements to the International Monetary Fund, communicated as a rate of GNI and is also inversely related ($r = -0.350$, $p<0.05$) with HDI in very high human development countries. Consumer price index has no association with HDI in all four types of HD countries.

TABLE 7

Correlations of HDI and national income & composition of resources

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Gross domestic product (GDP) "Total PPP $ billions)"	0.396**	0.242	0.295	0.311*
Gross domestic product per capita (2011 PPP $)	0.466**	0.719**	0.573**	0.577**
Gross fixed capital formation (% of GDP)	0.219	-0.048	-0.130	-0.168
General government final consumption expenditure "Total (% of GDP)	0.175	-0.060	0.212	0.017
General government final consumption expenditure "Total (% of GDP)	-0.215	0.172	-0.031	-0.164
Total tax revenue (% of GDP)	0.303*	-0.072	-0.075	-0.014
Taxes on income, profit and capital gain (% of total tax revenue)	0.625**	-0.256	-0.126	0.170
Research and development expenditure (% of GDP)	0.632**	0.360**	0.379*	0.123
Domestic credit provided by financial sector (% of GDP)	0.563**	-0.040	0.101	0.115
External debt stock (% of GNI)	-0.350*	-0.155	-0.055	-0.239
Total debt service (% of GNI)	-0.350*	-0.070	0.249	0.113
Consumer price index (2010=100)	-0.193	0.079	-0.254	0.203

* $p<0.05$; ** $p<0.01$

HUMAN DEVELOPMENT INDEX AND ENVIRONMENTAL SUSTAINABILITY

Fossil fuels is the rate of aggregate vitality supply that originates from common assets shaped from biomass in the topographical preceding (like natural gas, oil and coal) and is positively significantly related with

HDI in medium ($r = 0.357$, $p<0.05$) and low ($r = 0.402$, $p<0.01$) human developed countries while renewable energy sources are the rate of aggregate vitality supply that originates from always recharged regular procedures, including sun powered, biomass, geothermal, wind, hydropower and sea assets, and certain waste barring atomic vitality and has positive relation with HDI in only low HD countries. Electrification rate is the general population with access to power, communicated as a rate of the aggregate populace and incorporates power sold financially (both on off grid and grid) and self-created power yet rejects unapproved associations. It is positively associated with HDI in very high ($r = 0.456$, $p<0.01$), medium ($r = 0.640$, $p<0.01$) and low ($r = 0.468$, $p< 0.01$) HD countries. Rural electrification rate also possesses the similar fashion of association with HDI. Carbon dioxide emissions per capita (tonnes) is positively significantly associated with HDI in high, medium and low HD countries while average annual growth (%) in carbon dioxide emissions per capita (tonnes), natural resources diminution, natural resources forest area and fresh water withdrawals have no association with HDI in all four types of HD countries. Infants mortality due to open-air pollution is inversely related with HDI in very high HD countries while infants mortality due to internal air pollution is inversely related with HDI in high and medium HD countries. In addition, infants mortality due to poor sanitization is also inversely related with HDI in high ($r = -0.374$, $p<0.01$), medium ($r = -0.395$, $p< 0.05$) and low ($r = -0.507$, $p<0.01$) HD countries. Population living on degraded land is the rate of the populace living on extremely or seriously debased land its deprivation considers soil well-being, biomass, biodiversity and water amount. This factor has no association with HDI in any type of HD countries. is the general population requiring quick help amid a time of crisis as a consequence of a characteristic calamity, including uprooted, cleared, destitute and harmed individuals, communicated per million individuals and has inverse relation ($r = -0.349$, $p<0.01$) with HDI in high human developed countries.

TABLE 8

Correlations of HDI and Environmental Sustainability

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Primary energy supply through Fossil fuels (% of total)	-0.107	0.212	0.357*	0.402**
Primary energy supply through Renewable sources (% of total)	0.208	0.091	0.034	0.319*
Electrification rate (% of population)	0.456**	0.087	0.640**	0.468**
Rural Electrification rate (% of population)	0.399**	0.100	0.563**	0.472**
Carbon dioxide emissions per capita (tonnes)	0.142	0.549**	0.608**	0.608**
Average annual growth (%) Carbon dioxide emissions per capita (tonnes) 1970/2011	-0.141	-0.183	-0.046	0.237
Natural resource depletion (% of GNI)	-0.220	-0.055	0.053	-0.303
Natural resources forest area (% of total land area)	-0.030	-0.093	-0.294	-0.013
Natural resources Forest area (% change) 1990/2012	-0.025	0.096	0.273	-0.118
Fresh water withdrawals (% of total renewable water resources, 2005-2014)	-0.046	-0.111	0.127	-0.008
Deaths of children (< 5 years of age) due to outdoor pollution (per 100,000 children under age 5)	-0.318*	-0.193	-0.151	-0.246
Deaths of children (< 5 years of age) due to indoor pollution (per 100,000 children under age 5)	-	-0.540**	-0.309	-0.511**
Deaths of children (< 5 years of age) due to poor sanitization (per 100,000 children under age 5)	-0.166	-0.374**	-0.395*	-0.507**
Population living on degraded land (%)	-0.103	0.067	0.160	-0.090
Population affected due to natural disasters (average per million people)	0.053	-0.349**	-0.093	-0.053

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND WORK & EMPLOYMENT

Employment to population ratio is a percentage of the working population with atleast 15 years of age and is positively significantly (r =

0.351, $p<0.05$) associated with HDI in very high human development countries. Labour force participation rate is a rate of a nation's working-age populace that draws in effectively in the work advertise, either by working or searching for work. It gives a sign of the comparative magnitude of the supply of work accessible to take part in the production of goods and enterprises. It is also positively significantly ($r = 0.288$, $p<0.05$) associated with HDI in very high human development countries. Employment in agriculture (% of total employment) has significant negative relation with HDI in very high HD nations only while employment in service (% of total employment) is positively significantly associated with HDI in very high ($r = 0.488$, $p<0.01$), high ($r = 0.274$, $p<0.05$) and medium ($r = 0.474$, $p<0.01$) human develop indexed countries. Labour force with tertiary education also has positive association with HDI in very high and medium HD countries while vulnerable employment is inversely related with HDI in high and medium HD countries. Total unemployment has no association with HDI while long term unemployment and youth unemployment have adverse effects on HDI. Output per worker is positively significantly related with HDI in very high, high and medium HD countries. Hours worked per week (per employed person) are also positively associated with HDI in only low human development countries.

TABLE 9

Correlation between HDI and Work & Employment

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Employment to population ratio (% ages ≥ 15)	0.351*	0.188	0.036	-0.112
Labour force participation rate (% ages ≥ 15)	0.288*	-0.033	-0.286	-0.119
Employment in agriculture (% of total employment)	-0.309*	-0.149	-0.264	0.015
Employment in Service (% of total employment)	0.488**	0.274*	0.474**	0.134
Labour force with tertiary education (%)	0.560**	0.247	0.397*	0.275
Vulnerable employment (% of total employment)	-0.060	-0.318*	-0.415**	-0.241
Total Unemployment (% of labour force)	-0.257	-0.193	0.213	0.177
Long-Term Unemployment (% of labour force)	-0.321*	0.060	0.360*	0.145

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Youth Unemployment (% of youth labour force)	-0.391**	-0.251	0.272	0.014
Youth not in employment or school (% ages 15-24)	-0.115	0.017	-0.030	-0.089
Output per worker (2011 PPP $)	0.535**	0.380**	0.423**	0.188
Hours worked per week (per employed person)	0.130	0.116	-0.079	0.348**

* p<0.05; ** p<0.01

HUMAN DEVELOPMENT INDEX AND INTERNATIONAL INTEGRATION

Exports and imports (% of GDP) has no relation with HDI in all four types of HD countries and similar fashion of relationship has been observed between HDI and foreign direct investment, net inflows (% of GDP) except in medium HD countries where it has inverse relations ($r = -0.327$, $p<0.05$). Private capital flows is positively associated ($r = 0.297$, $p<0.05$) with HDI in very high HD countries only. Net official development assistance received is the distributions of credits made on concessional terms (net of reimbursements of primary) and allows by authority organizations to advance monetary improvement and welfare in nations and regions on the Development Assistance Committee rundown of help beneficiaries, communicated as a rate of the beneficiary nation's GNI. It has strong inverse relationships with HDI across all the categories of HD nations. Remittances, inflows (% of GDP) is inversely related with HDI in high ($r = -0.411$, $p<0.01$) HD countries while net migration rate (per 1,000 people) has positive association with HDI in very high ($r = 0.356$, $p<0.05$) and high ($r = 0.395$, $p<0.01$) human developed countries. In addition, stock of immigrants (% population) has no significant relation with HDI in four types of HD countries groups. International student mobility (% of total tertiary enrolment) has positive association with HDI in very high ($r = 0.295$, $p<0.05$) HD countries while international inbound tourists (thousands) are positively associated with HDI in low ($r = 0.498$, $p< 0.01$) HD countries. Internet users (% of population) have positive impact over HDI across all the HDI grouped nations while Mobile phone subscriptions (per 100 people) are positively associated with HDI in medium ($r = 0.534$, $p<0.01$) HD countries only. In

addition, Mobile phone subscriptions (% change) have negative relationships with HDI in low ($r = -0.383$, $p<0.05$) HD countries.

TABLE 10

Correlations of Human Development Index and International Integration

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Exports and imports (% of GDP)	-0.126	0.091	-0.100	-0.017
Foreign direct investment, net inflows (% of GDP)	0.022	-0.007	-0.327*	-0.295
Private capital flows (% of GDP)	0.297*	0.058	0.193	0.112
Net official development assistance received (% of GNI)	-0.336*	-0.473**	-0.350*	-0.484**
Remittances, inflows (% of GDP)	-0.198	-0.411**	0.052	0.056
Net migration rate (per 1,000 people)	0.356*	0.395**	0.115	-0.081
Stock of immigrants (% of population)	0.136	0.197	0.185	-0.179
International student mobility (% of total tertiary enrolment)	0.295*	-0.130	-0.121	-0.205
International inbound tourists (thousands)	0.273	0.215	0.223	0.498**
Internet users (% of population)	0.564**	0.473**	0.406*	0.587**
Mobile phone subscriptions (per 100 people)	-0.280	0.236	0.534**	0.243
Mobile phone subscriptions (% change)	-0.117	-0.014	-0.015	-0.383*

* $p<0.05$; ** $p<0.01$

HUMAN DEVELOPMENT INDEX AND WORK WITH EXPLOITATION, RISKS & INSECURITIES

Child labour (% ages 5–14) and female & male home employees (% of total employment) are significantly inversely related with HDI in very high HD countries only. Working poor at PPP $2 per day is inversely related with HDI in very high, medium and low HD countries while low pay rate (% of total employment) and Nonfatal Occupational injuries (thousands) are not associated with HDI in any type of HDI grouped countries. Redundancy welfares beneficiaries (% of unemployed ages 15–64) have positive associations with HDI in very high HD countries

only while old age pension receivers are positively related with HDI in high and medium human development indexed countries.

TABLE 11

Correlations of Human Development Index Work with Exploitation, Risks and Insecurities

	HDI Nations			
	Very High	**High**	**Medium**	**Low**
Child labour (% ages 5–14)	-0.450**	-0.196	-0.195	-0.274
Female Domestic workers (% of total employment)	-0.299*	0.086	0.216	0.154
Male Domestic workers (% of total employment)	-0.287*	0.073	0.228	0.135
Working poor at PPP $2 a day (% of total employment)	-0.355*	-0.128	-0.383*	-0.402**
Low pay rate (% of total employment)	0.102	0.004	0.288	-
Nonfatal Occupational injuries (thousands)	0.258	0.209	0.250	0.175
Fatal Occupational injuries (Cases)	0.264	0.244	0.418**	0.207
Unemployment benefits recipients (% of unemployed ages 15-64)	0.513**	0.222	0.243	-
Mandatory paid maternity leave (days)	-0.048	0.233	0.152	-0.090
Old-age pension recipients (% of statutory pension age population)	0.336	0.265*	0.337*	0.200

* $p<0.05$; ** $p<0.01$

IV. CONCLUSION

The recent eras have seen restored enthusiasm in understanding that how quality of life of people is attached with the human development and economic growth of countries. Human Development Index (HDI) is a combination of statistics used in measuring the human improvement level of any nation and to permit cross-country analysis. Several factors are attached with the human development and vary from low developed nations to very high developed nations e.g., life expectancy at birth, women empowerment, average years of schooling for male, public health expenditures, public expenditures on education, total tax revenues, research & development expenditures, taxes on income, profit & capital

gain, domestic credit provided by financial sector, labour force participation rate, employment to population ratio, private capital flows, net migration rate, international student mobility and unemployment benefits recipients are positively associated with human development index in very high human development index countries. In addition, factors that are inversely related with HDI in very high human development index nations are average annual GDI growth, female & male adult mortality rate, external debt stock, total debt service, infant's mortality due to outdoor pollution, employment in agriculture, youth unemployment, male & female domestic workers and child labour

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