

MODIFIED HUMAN DEVELOPMENT INDEX FOR INDIA

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation report entitled, "**Modified Human Development Index for India**" is based on the results of investigations carried out by me in the **Master of Economics** at the **Goa Business School, Goa University** under the Supervision of **Ms. Sumita Datta** and the same has not been submitted elsewhere for the award of a degree by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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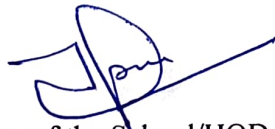
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PREFACE

My dissertation represents the peak of an intellectual journey that has been both challenging and rewarding. It reflects my passion for Economics and my dedication to exploring growth and development. Throughout this research aim, I have encountered numerous opportunities for growth, learning, and self-discovery.

The inspiration for my dissertation stems from a desire to make a meaningful contribution to society, human well-being, and also opportunities to contribute to human development. As I search deeper into the literature and engage with various methodologies, my understanding of the subject yields leading to new insights and perspectives.

In embarking on the journey of this dissertation, titled "Modified Human Development Index for India ", In the pursuit of understanding and measuring human progress, the Human Development Index (HDI) has long served as a guiding policymakers and scholars alike. As our understanding of development evolves and our world undergoes transformative changes, it becomes imperative to revisit and adapt our methodologies to ensure they accurately reflect the multidimensional nature of human well-being.

This revised edition of the Human Development Index introduces modifications that aim to better capture the more accurate and contemporary societal progress. By incorporating indicators that reflect not only economic prosperity but also environmental sustainability. As we embark on this journey of reimagining human development, it is our hope that this modified index will serve as a more robust tool for fostering inclusive growth, guiding policy interventions, and advancing the collective welfare of humanity.

Ranjita Bondeikar

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ABBREVIATIONS USED

Entity	Abbreviation
Human Development Index	HDI
Modified Human Development Index	MHDI
Non-vulnerable Employment	VI
Employment To Population Ratio	EI
Aggregate Differences	AD
United Nations Development Programme	UNDP
World Bank and World Development Indicators	WB, WDI
Economist Intelligence Unit	EIU

ABSTRACT

The Human Development Index is an aggregate indicator designed to track the development of countries. Since 1990, this has been widely used by many countries and it also captured the attention of policymakers, academicians, and economists. The Modified Human Development Index (MHDI) is derived from the same conceptual framework as the conventional HDI, using a geometrical average of its component subindices. The study aims to construct and compare the Modified Human Development Index by incorporating new dimensions (Democracy, Employment, Environment) for it to better express the progress of the development. And to examine the present status of human development in India vis-a-vis other countries. To combine components into one index existing formula of HDI has been used. The study presents MHDI scores for countries. The Fixed Effect method is applied to examine the difference between MHDI and HDI and also the differences between countries. The study finds there are statistically significant differences between MHDI and HDI.

CHAPTER I

1. INTRODUCTION

1.1. Background

The Human Development Index is an aggregate indicator. It changed into advanced through Pakistani economist Mahbub-u-Haq (1990) and Indian economist Amartya Sen (2002) because it became first simplified through the United Nations Improvement Programme in 1990, it has attracted the attention of policymakers, economists, academicians and additionally politicians all over the world. Many nations broadly take delivery of this index and it additionally helps to decide applications to enhance human prosperity. A human improvement index is a method to the richness and human lifestyles so their major purpose changed into to improve human life. (Salas-Bourgoin, 2014). The Human Development Index (HDI) displays Amartya Sen's "abilities" method for gauging human well-being. This approach prioritizes desired results, consisting of a first-rate widespread of residing, over mere economic signs like earnings per individual. HDI operationalizes key competencies by using measuring to get the right of entry to health, training, and items, which are crucial for improvement. By enabling people to get admission to these abilities, they can paint closer to achieving their preferred kingdom of proper being. (Stanton, n.d.)

Consistent with the UNDP, it represents nations' typical achievements and summarizes the geometric suggestion of the three dimensions of human development. So HDI includes three dimensions: extended and healthy lifestyles, know-how, and a respectable well-known residing. It carries the essence of society's progress by considering factors which include existence expectancy at the start, the suggestion of years of schooling and anticipated years for children of schooling, and gross countrywide income per capita. The HDI offers a complete yet handy method of comparing human development stages across exceptional countries. One of the essential strengths of the HDI lies in its capability to spark off important questions about countrywide coverage selections, so it could shed mild on disparities in human development

results between nations with similar ranges of per capita earnings. Such contrasts discussions approximately the efficacy of presidency regulations and priorities, via a deeper understanding of societal wishes and challenges. the HDI crucially offers a partial glimpse of human improvement. It does not coloration such as inequalities, poverty, gender disparities, or issues related to human safety and empowerment, to achieve better know-how of a country's improvement, additional signs and statistics are provided in assets which include the Human development records. The HDI serves as a valuable device for gauging general development in human development, it ought to be quite many socio-monetary elements to paint a complete photo of a kingdom's development. (Human Improvement Index | Human Development reports, n.d.)

1.2. Modified Human Development Index for India

India's rank in HDI became 132nd in 2022 with a 0.633 rank, India comes underneath the medium variety. The Modified Human Development Index (MHDI) is an adaptation of the conventional Human improvement Index (HDI) that aims to beautify its comprehensiveness and precision. unlike the HDI, which in most cases focuses on signs like profits, training, and health, the MHDI contains extra dimensions and signs to offer a greater nuanced understanding of human improvement. The MHDI seeks to address the constraints of the HDI by providing an extra holistic approach to measuring human improvement. by integrating a broader variety of signs, the MHDI aims to seize the multidimensional nature of human well-being and offer policymakers greater informed insights for development planning. The MHDI represents a refinement of the HDI, providing a more comprehensive tool for assessing and comparing human improvement across one-of-a-kind areas and populations. It serves as a treasured framework for expertise in the various factors that contribute to ordinary human well-being and guiding efforts to promote sustainable improvement and social progress. numerous

researchers have sought to enhance the Human Development Index by suggesting the inclusion of extra dimensions like democracy, employment possibilities, and different socio-financial variables deemed crucial for human progress. This study includes fundamental dimensions like Democracy, Employment, and Environment to assist in laying and regulating human development by way of including new additives which include freedom, employment to the population ratio, non-vulnerability to general employment, CO2 emission, and forest vicinity. Employment is merely an economic means an effort to satisfy humans' fabric needs and help them get away from poverty. Democracy will recommend a manner to gauge freedom and the environment will assist in creating a want to supplement the issue of human improvement. The fundamental concept assumes a tremendous correlation among employment, freedom, surroundings, and improvement, suggesting that improvements in these regions increase opportunities and alternatives within a society. Incorporating entities of subindices into HDI that is Democracy, Employment, Non-inclined employment, and CO2 emission and forest location are calculated within the same way as education and fitness subindices. The modified human development index is calculated by the usage of the identical system as HDI.(Salas-Bourgoin, 2014).

1.2. Objectives

- To measure and compare human development by adding new dimensions in HDI.
- To examine the present status of human development in India vis-a-vis other countries.

1.3. Hypothesis

❖ Hypothesis for the first objective:

H0- There is no significant difference in rank between MHDI and HDI over the years for India.

H1- There has been a significant difference between MHDI and HDI over the years in India.

❖ **Hypothesis for the second objective:**

H0- There is no significant difference in rank between MHDI and HDI over the years between selected countries.

H1- There is a significant difference between MHDI and HDI over the years between selected countries.

1.3.1 Research Questions

- Can HDI improve further by adding new dimensions?
- What are the plausible new dimensions?
- Which dimension in the modified HDI is most effective in capturing India's developmental aspects?
- How does the modified HDI compare with the traditional HDI in capturing human development in India?

1.4. Scope of the study

This observation is based totally on a Modified Human Development Index. New dimensions will assist development to explicit in a better manner and additionally, it'll improve the development of improvement. This index is widely well-known utilizing many nations and it affords records to researchers. HDI gives more knowledge of human improvement. several researchers undertake additional studies, with the aid of incorporating new dimensions, it's going to assist in deciding social measures of improvement for calculating the general development of a country. HDI is taken into consideration as very effective in measuring the performance of a country via its dimensions. The relative rank of the primarily based on the modified index is drastically distinct from that primarily based on traditional HDI.

CHAPTER II

2. LITERATURE REVIEW

“As the 1990 Human Development Report argued, a basic distinction needs to be made between the means and the ends of development. Human beings are the real end of all activities, and development must be centered on enhancing their achievements, freedoms, and capabilities.” (Anand and Sen, 1994, p.1)

Since 1990, HDI has been an average summary of achievements of human development. HDI is widely accepted as one of the economic indicators, HDI consists of three indicators so my study is based on modified HDI, by incorporating new dimensions that will help development to express in a better way and also help to improve the progress of development. modified HDI gives more understanding of human development.

For this, I have searched for related articles and read on them. Based on modified HDI there are several studies are done, modification basically by adding new dimensions and modification done in methodologies.

(Salas-Bourgoin, 2014) This paper talks approximately how the Human Development Index (HDI) has a few issues and indicates making it higher by including indicators like Employment and freedom together with health, education, and income. additionally, this paper focuses on human development extra largely. Additionally, it tells us a way to parent out this new HDI by taking the formula of present HDI and showing scores for 117 countries to explain how it works and examine their effects on HDI and MHDI. This has looked at has found that MHDI has lower scores by including new dimensions that facilitate getting extra accounts between distinct nations which presents more correct results. This look offers a principal concept about

increasing employment tiers which implies more social opportunities and one-of-a-kind options for people.

(Leiwakabessy & Amaluddin, 2020) This has a look at creating a new human development index (MHDI) by adding democracy, employment, fitness, schooling, and income. The study aims to assemble MHDI and also examine and measure human improvement development in Indonesia. To research MHDI they used PCA and 2SLS strategies. So look at finds great differences between MHDI and popular HDI and compare human improvement in Indonesian provinces. It also unearths the relationships among human improvement, financial growth, and democracy through the usage of statistical fashions. So This looks at suggesting to prioritize regulations that aid economic boom and democratic balance for improvement. This research novelty lies in incorporating democracy and employment into the human development index production.

(Noorbakhsh, 1998) This study proposes a modified index based on the Human Development Index (HDI) by the UNDP. This examination addresses technical issues in both the components and shape of the HDI using facts from the Human Development Report 1995 for 174 countries, with the aid of the usage of the proper formulation. changes to the HDI to improve its comprehensiveness and precision. these adjustments encompass incorporating extra signs consisting of inequality in schooling and income distribution, environmental sustainability, and gender disparities. by way of integrating those extra elements, the MHDI presents extra nuanced information on human improvement and its determinants. The paper probably talks about how they discovered the MHDI and the way it's unique from the ordinary HDI. they could display evidence that the MHDI is better at know-how human improvement from special angles and enables policymakers to make better decisions for development.

(Galyna Nazarova, 2019) This examination discusses modifying the existing human improvement index to assess local development in Ukraine. It adds records and verbal exchange technology improvement and updates education and environmental welfare components, which adjusts weighting coefficients based totally on social conditions. So the techniques they have covered are generalization, contrast, system evaluation, and hierarchy analysis. For Calculations they used statistical information from Ukrainian areas for 2015-2017, showing substantial nearby disparities in human improvement degrees.

(Estrada, 2005) This text proposes a holistic approach to assessing the effectiveness of Extension service base applications which emphasizes the need for a comprehensive index tailor-made to the network assets and monetary development application. The present-day final results of these measures are often focused on specific initiatives and additionally make a specialty of missing a complete expertise of application effectiveness. This examination adopts a holistic index that's similar to the United Nations Human Development Index, which includes diverse outcome measures, and standard community well-being can be highly evaluated within this program.

(Biernacki & Guzek, 2019) This observation looks at how international locations have evolved economically and socially, so the writer has divided them into groups like up-Communist, Scandinavian, welfare states, and rich smaller countries. To a degree, the modified HDI used information from 2006 to 2015. so they discovered that up-communist international locations have a huge improvement in both GDP and social development, however, the modified HDI occasionally fails to provide a clear indication of those variations, tremendously, the dearth of consistent development in the big and rich international locations shows that development goes beyond mere numerical measurements which highlighting its complexity.

(Jha, 2017) This look tells us that in trendy international, wherein one in seven people are disabled, the conventional methods are to assessing a country's development, which is referred to as the Human Development Index (HDI), might not provide a complete understanding. so they have developed a brand new index that specifically seems at how long humans live, how educated they may be, and what kind of cash they have. nonetheless, it would remember the best of lifestyles or how clean it is to get healthcare. So, this examination shows that including healthful existence Expectancy (HALE) inside the HDI is vital. This study introduces a new version of the HDI which takes into consideration how healthful people are and shows a brand new manner to group nations based totally on statistics. They took a look at used statistics from 2016 and used a method referred to as Discriminant analysis, so they have a look at found the new version, which we call the Fitness Adjusted Human Development Index (HAHDI), which provides a more correct illustration of the level of development in nations.

(M.D, 2008) This paper discusses a new way to measure and promote the development of societies by focusing on CIS and Eastern European international locations. The study introduces the modified Human Development Index (MHDI), which considers earnings, training, and life expectancy. This index is designed to be greater suitable for measuring the progress of societies in industrialized and submit-industrialized settings. MHDI's objectives are to provide a complete view of a rustic's development by using the use of to be had information together with income consistent with man or woman and education stages. it's far designed in this type of manner that it can help policymakers make knowledgeable decisions and tune long-term development. moreover, they take a look at MHDI which can be used to compare the properly-being of countries internationally and inside regions like the European Union.

(LIPTÁK) This takes a look at offers a deeper insight into societal development beyond depending solely on conventional signs like GDP. This look examines human useful resource improvement in Romania and Hungary's NUTS2 areas using the MHDI developed using the Hungarian Crucial Statistical Workplace (HCSO). The MHDI is considered to offer a more comprehensive degree of improvement in comparison to standard indicators. This has a look at a few Innovations in its methodology, so the studies calculate MHDI values for 2004 and 2007 which and emphasize the developmental reputé of areas and its effect on local employment. The look will consist of an assessment of methodologies with the HDI, statistics series, and the presentation of mapped MHDI values.

(Safari & Ebrahimi, 2014) This look proposes a more than one standard choice (MCDM) technique referred to as changed Similarity for ranking nations based on the Human Development Index (HDI). like the conventional technique of averaging health, schooling, and profits indices with identical weights, this technique also offers an alternative technique to rating nations. This takes a look at carrying out the modified Similarity method to HDI records from 2010 and 2011 Human development reports, so the study found variations in us of scores in comparison to the traditional technique. So This revolutionary new approach addresses criticisms of the HDI calculation method which offers an ability alternative for evaluating human improvement.

(Jin et al., 2020) They have a look at proposing an amendment to the Human Development Index using the Entropy approach, aiming to create an extra complete degree of sustainable development at a global level. This takes a look at the country-wide Sustainable Development Index (NSDI) in keeping with the UN 2030 agenda. it is designed in such a way that it could improve the Human Development Index (HDI) by way of thinking about extra components of sustainability. This NSDI balances financial, social, and environmental elements over the

years. This includes 12 indicators and the entropy-based weighting approach is used to measure sustainability across 163 nations. After the use of methods based totally on results they in comparison them to different indices like modified HDIs, and NSDI presents a better basic view of sustainability and facilitates policymakers to make higher selections approximately human development.

(Mudgal & Manglani, 2023.) This look aimed to make the Human Development Index (HDI) extra in line with Sustainable Human Development, so It brought a new version referred to as the changed HDI (MHDI) specifically for BRICS countries from 2000 to 2019. The changed index targets to provide an extra complete assessment of human improvement in BRICS countries, imparting policymakers with insights for fostering sustainable and inclusive improvement techniques. This MHDI consists of elements like employment, human values, environmental sustainability, and the satisfaction of health and education. For this study, they used foremost aspect analysis to discern how environmentally sustainable each United States is. by way of searching at how those elements relate to MHDI, this look offers ideas for policymakers to make regulations. so that they observed that MHDI rankings are decreasing than HDI scores, suggesting that BRICS countries might not be as evolved as HDI suggests. They look at opinions on the conventional Human Development Index for its limited illustration of properly being and propose a changed Human Development Index for BRICS nations. The examination emphasizes the significance of addressing employment possibilities, human values, healthcare, education, and environmental pleasant to decorate overall human improvement in BRICS international locations.

(Paul, 1996) This observation introduces a revised version of the Human Development Index that aligns with the perspective of students like Sen which emphasizes that improvements in higher-degree indicators signify extra achievements in comparison to similar improvements at lower tiers. They have a look at additionally incorporating the toddler survival price, an important indicator of development. by way of searching at the consequences of this look at we will evaluate them. This new index suggests large variations in how international locations are ranked in comparison to HDI. This observation shows that the changes made are beneficial and based on actual-world proof.

(Migęła-Warchoł, 2019) This look proposes an opportunity degree to the extensively used Human Development Index (HDI) for assessing the socio-financial improvement of countries. This observation provides a brand-new manner to measure how properly countries in the ECU Union are doing. This study looks at one aspect just like the Human Development Index in addition they look at a bunch of different things like earnings and Employment, technological know-how and technology, health, schooling, and the way humans live. then combine all of these signs to get better information about the way well-off humans are in these nations. This looks at ambitions to offer a deeper insight into the socioeconomic improvement of EU citizens via calculating a mathematics implication of indicators within each determinant. a modified HDI seeks attention to provide delivered statistics past the traditional methods of gauging human beings' satisfaction with existence.

(Shah, 2016) This paper looks at what impacts the Human Development Index (HDI), which tells us how nicely off humans are in unique international locations. It examines factors such as earnings, life expectancy, and training degree. This observation found that locations with better training, longer existence expectancy, and extra profits generally tend to have better HDI rankings. In assessment, locations with more babies, greater profit inequality, and more

pollutants tend to have decreased ratings. This take-a-look version explains most of the differences in HDI which indicate that areas like Europe & important Asia Latin the us & the Caribbean are doing better than South Asia and Sub-Saharan Africa.

(Sidney Wong, 2011)They take a look at talks about human development and its demanding situations in dimension, and methodological issues in multidimensional index creation, this look emphasizes the significance of composite indices. A look at opinions on financial indicators introduces the UNDP's HDI and addresses barriers whilst exploring diversifications and associated indices. Methodological challenges include indicator selection, normalization, weighting, and aggregation techniques, which might be crucial for growing neighborhood-stage indices. this has a look at Composite indices, important across domain names like investment climates and health, simplifying complex records carefully, and presenting precious insights for selection-making strategies.

(Sen, 1999)The paper argues that improvement is satisfactory to recognize and explore human beings' actual freedoms instead of merely economic boom or industrialization. This examination highlights the significance of political, social, and monetary preparations in enhancing human abilities. Examples like how financial unfreedom can lead to social and political unfreedom, emphasizing the interconnectedness of different varieties of freedoms. moreover, this paper additionally discusses the position of markets in development and their importance. This look considers other elements together with social values and institutions. subsequently, this study examines 5 forms of instrumental freedoms and their interrelation in fostering human skills and overall freedom. They take a look at discussing human well-being and past wealth, which is inspired by Maitreyee's mirrored image of the limitations of riches for immortality. studies have recognized diverse sorts of unfreedom, including famines, lack of basic wishes, political oppression, and gender inequality. They take a look at highlights of

their critical function in each monetary increase and human flourishing. It emphasized having the proper policies and real possibilities are key to genuine freedom. research has requested a complete way of development that focuses on what human beings can do and the way well they can live, not just on cash, to make society extra honest.

(Noorbakhsh, 1998) This examination evaluates the UNDP's Human Development Index (HDI) and explores criticisms of its shape. An observer has proposed upgrades to the additives and shows a brand-new framework for the index. This looks at used facts evaluation from the Human Development Report 1995 and assessment of alternative indices that have derived from the HDI components. The aims examination has been primarily based on determining whether or not new indices possess the predicted residences of an index. If these new indices are considered redundant, then this observation has investigated the consequences of characterization primarily based on existing literature.

(Bravo, 2014) This observation has proposed a brand-new idea by way of including Environmental dimensions in HDI and giving it a brand-new name the Human Sustainable Development Index (HSDI) In introduced dimensions they encompass signs according to capita CO2 Emissions. This has a look at pursuits to resolve the trouble by growing a brand-new index using modern-day statistics from the UN. This examination additionally suggests the relationship between HSDI and HDI through binary correlation. This look has observed that even though the HSDI improves upon the HDI, it nevertheless doesn't fully don't forget environmental sustainability. So we want a better balance between social, financial, and environmental factors to create a sustainable Development index.

(Stanton, 2007) This study made a massive impact on development concept, dimension, and coverage utilizing introducing the Human Development Report (HDR) and the Human Development Index (HDI). This paper affords a top-level view of the evolution of the Human

Development Index (HDI). The paper discusses how the HDI turned into brought to shifted the point of interest of improvement theory and coverage toward broader indicators of human welfare beyond simply economic growth. This has a look at highlights the incorporation of Amartya Sen's talents technique into the HDI framework, emphasizing components like health, training, and access to items making an allowance for comparisons among 177 nations. The paper additionally examines the significance of the HDI in shaping international improvement discourse and guiding coverage decisions.

(Ranis et al., 2000) This examination gives the relationship between economic increase and human improvement. It explores how monetary growth alone may not necessarily translate into improvements in human well-being, as measured by way of indicators inclusive of health, training, and dwelling standards. The study argues that whilst a monetary boom is critical for development, it must be accompanied by the aid of policies and investments that at once target human development consequences. This examination has discussed various factors that influence the link between economic growth and human improvement, including income distribution, admission to basic offerings, and social regulations. This paper has provided insights into the complicated interaction between monetary increase and human development, advocating for an extra holistic technique to development that prioritizes the properly-being of individuals' proper well-being and prosperity.

(Ravallion, 2012) This paper examines the ability boundaries and trade-offs within the Human Development Index (HDI). This study has discussed how the HDI is a broadly used measure of improvement, and it can no longer capture essential dimensions of human well-being and progress. So observation points out potential trade-offs among different components of the HDI, including the trade-offs among earnings and different indicators like fitness and

education. The take look highlights challenges that are as it should be measuring and weighing the components that should provide a comprehensive evaluation of human development. This paper seriously evaluates the HDI and suggests opportunity tactics or measures that could offer a more nuanced know-how of development consequences.

(Harttgen & Klasen, 2012) This examination proposes a technique for measuring human improvement at the family level. This observation paper introduces the idea of a family-primarily based Human Development Index (HDI) as an extra sensitive measure than conventional aggregate human development measures. The look argues that traditional HDI measures, which are typically primarily based on national averages, mask inequalities inside nations and fail to capture disparities at the household stage. To cope with this difficulty, this look is probably to suggest a method for building a family-stage HDI that takes into account elements that include training, profits, and fitness results at the man or woman or household stage. This takes a look at ambitions to provide a more comprehensive know-how of the distribution of properly-being inside populations. This idea may also help policymakers to pick out marginalized corporations and layout targeted interventions to cope with their particular wishes, promoting greater inclusive and equitable human development. So this examination contributes to the ongoing debate on how excellent it is to measure and promote human development and offers insights into the importance of considering family-stage dynamics in improvement policy and practice.

(Rachid & Saidi, 2015) This has a look at investigates the relationship between democracy and financial growth within the Middle East and North Africa (MENA) region. To investigate records from various MENA nations the look has used an empirical method that examines whether or not democratization has a superb or bad impact on economic boom within the vicinity. The have a look at has included elements such as political stability, institutional great,

and governance systems of their evaluation. This observation has discussed the theoretical mechanisms via which democracy may want to have an impact on the economic boom, inclusive of through multiplied political balance, stepped forward governance, and superior investment. The study has located that it could provide treasured insights for policymakers and scholars who are interested in information on the dynamics among political systems and monetary overall performance inside the MENA region.

(Mahbubulhaq,1990)This has looked at has probably described human development past traditional measures of monetary growth, emphasizing the significance of improving people's well-being, talents, and opportunities. the writer has argued that human improvement encompasses no longer only fabric wealth but also elements consisting of education, healthcare, gender equality, environmental sustainability, and social justice. This examination has mentioned how rapid globalization, technological advancements, demographic modifications, and environmental degradation have reshaped the panorama of human improvement. A study has highlighted the need for modern policies and strategies to cope with these emerging demanding situations at the same time as promoting inclusive and sustainable improvement. This takes a look at provides empirical evidence to demonstrate the complications among monetary, social, and environmental factors in shaping human development consequences. The Take a Look gives a comprehensive analysis of the evolving nature of human improvement and the techniques that have to ensure that humans will have pleasing and dignified lives in an unexpectedly converting world.

(Cecilia Adrogué - Ricardo Crespo 2010) This observation talks approximately about how we measure improvement in economics, using something referred to as the Human Development Index (HDI) for example. observe says that at the same time as the HDI is broadly used, it might not provide us the full picture of improvement because it especially appears at cash-

related stuff like GDP in step with man or woman, how long humans live, and the way educated they may be. So authors suppose that some important matters have been neglected. This examination additionally says that the manner we decide how essential each of these factors is may not be truthful. So have a look at what has cautioned we must consider other such things as social and environmental elements while measuring development. they're saying we need to reconsider how we measure improvement to make certain we are now not missing something essential.

(Martha C. Nussbaum, 2012) In *Have a Look*, the writer discusses the Human Development technique, which focuses on improving human being's abilities to steer valuable lives. They take a look at argue that the conventional awareness of profits and wealth in improvement economics overlooks important factors of human properly-being, rather the observer has cautioned that development efforts ought to aim to make bigger people's talents feature efficaciously in society and pursue what they cost. This observation has identified ten principal capabilities that the author believes are critical for human flourishing, consisting of the ability to live a long and healthy existence, to be educated, to participate in political and social sports, and to have possibilities for amusement and self-expression. The look emphasizes the significance of a rights-primarily based method of development that prioritizes human dignity and enterprise. This look at the framework presents a holistic attitude on development that is going past monetary signs, advocating for rules and interventions that empower individuals to live pleasant lives in line with their aspirations and values.

(MAHAJAN et al., 2012) This paper opposes the conventional Human Development Index (HDI) for its slim attention on income, training, and fitness, neglecting vital dimensions like sustainability, civic participation, and first-rate employment. This examination gave a more comprehensive degree of human improvement, to cope with this, the paper introduces the major

element of the complete Human Development Index (CHDI), which includes these extra dimensions and relevant indicators. using circled foremost factor evaluation (PCA), they have a look at deriving the weights of these variables to assemble the pc-CHDI. They take a look at targets to expand the knowledge of human development by including those dimensions, supplying policymakers with more nuanced insights for powerful improvement-making plans. They take a look at utilizing SPSS facts 15.0 to compute standardized ratings, which might be then processed via foremost thing evaluation (PCA) to derive a brand new degree of human improvement referred to as computer-CHDI. The validity of the usage of PCA is confirmed through Berliet's take-look at Sphericity and Kaiser-Meyer-Olkin (KMO) measure of Sampling Adequacy. the usage of predominant factor analysis in computer-CHDI presents scientifically derived relative weights for these indicators, reducing subjectivity. CHDI is that consequences are offered on a linear scale, which complicates interpretation, although they can nonetheless be beneficial for ranking nations or regions through the human development stage.

(Nathalie Hilmi, 2015) The take a look at focuses on incorporating sustainable development concerns into the calculation of the Human Development Index for Middle East and North African (MENA) nations. It proposes a changed model of the HDI to better replicate the sustainable improvement elements of these international locations. by way of adjusting the traditional HDI to consist of sustainability signs. The examination introduces precise indicators derived from an aggregate of various simple signs representing numerous dimensions of sustainable improvement. The signs such as GDP according to capita, overall greenhouse gas emissions, renewable energy percentage in gross inland consumption, transportation power usage, resource productiveness, abundance index of commonplace chook populations, fish catches beyond secure biological limits, existence expectancy in good health, poverty risk charge publish-social transfers, employment rate amongst older workers, and respectable development assistance. these signs intend to offer a complete assessment of sustainable

improvement, covering economic, environmental, and social elements. This takes a look at possibly discussing the process of aggregating these indicators and their significance in shooting the multidimensional nature of sustainable development. The changed index goals are to provide a greater comprehensive photo of human development in the MENA region. The look discusses the methodology used to calculate this modified HDI, which includes the selection of sustainability indicators and their incorporation into the index. the existing empirical findings show the effectiveness of the changed index in capturing sustainable development factors and supplying insights for policy-making plans and decision-making within the MENA nations.

(Santhirase, 2007)the main objective of this look is to investigate whether loose economic and political rules promote economic increase in developing countries. using a least squares quantitative methodology, the take a look at examines the results of freedoms on financial growth. even as going via existing literature and coverage prescriptions, they take a look at a sturdy poor dating between political freedom and monetary growth in over 70 growing nations from all areas all through the duration 2000-2004. to look the connection among them the look at has used the econometrics version of latest classical increase concept. moreover, while monetary freedom is negatively associated with monetary increase, it does now not have a sizable impact. The look shows that reaching a fast financial boom in developing international locations is hindered by using challenges related to freedom in choosing imperative management through joint collective choice-making strategies. The observation has discovered that challenges the triumphing perception of the tremendous position of democratic and economic freedom in fostering monetary growth, which is regularly visible as a precondition for economic development.

(Gerring et al., 2012) This study explores the relationship between democracy and human development, examining whether democratic political systems contribute to advancements in human well-being. This study has a diverse range of theoretical perspectives and empirical evidence, to analyze the impact of democracy on various dimensions of human development, including health, education, income, and overall quality of life. The study employs a comprehensive dataset covering multiple countries over an extended period to assess the influence of democracy on human development outcomes. The findings of the study suggest that while democracy may have a positive impact on some aspects of human development, such as health and education, its effects are complex and vary across different contexts. The study concludes by discussing the implications of these findings for theories of democracy and human development, as well as for policy and future research in this area.

(Clay Kelsey, 2006,) This has a look at utilizing the United Nations Human Development Index as a framework for comparing socioeconomic signs throughout Florida's sixty-seven counties. The look emphasizes the importance of socioeconomic facts for powerful city planning, hazard mitigation, transportation forecasting, and other county-level and state-degree functions. By adapting the HDI to assess county-degree situations, they have looked at aims to provide precious insights into which plans and coverage adjustments are most needed and beneficial. The modified index outcomes are presented through the use of choropleth maps to offer a spatial context for decoding the ranked socioeconomic values. ultimately, the thesis evaluates the suitability of the changed index model for normalizing, aggregating, and ranking county-stage socioeconomic facts in Florida and assesses the effectiveness of choropleth mapping in showing those rankings. The examination concludes that the FCHDI effectively normalizes, aggregates, and ranks socioeconomic records at the county degree, and those ratings are appropriate for choropleth mapping. when plotted on choropleth maps, the FCHDI ratings reveal recognizable clusters and region patterns, which include coastal as opposed to inland

counties, highlighting capacity socioeconomic relationships among counties and inside areas. The observation effectively achieves its goal of developing an index based on a present version and geographically plotting the index rankings. The ensuing visualization of socioeconomic patterns and spatial relationships offers precious insights and suggests the importance of similar studies in this area. This takes a look at yields an advantageous conclusion.

(Sudhir Anand and Amartya sen, 1994) This examination affords a comprehensive evaluation of the Human Development Index which is broadly used as a measure of human well-being. The examination explores the methodology in the back of the HDI and its evolution when you consider its inception. The examination discusses the cause for using the HDI as a composite degree that incorporates factors beyond monetary signs, such as fitness and training. The examination also explores the challenges and obstacles of the HDI, which incorporates troubles associated with records availability and comparison throughout international locations. additionally, this has a look at discusses ability refinements and extensions of the HDI to better seize the multidimensional nature of human improvement. The examination serves as a valuable resource for know-how on the conceptual foundations and sensible programs of the HDI in assessing human well-being on a global scale.

(Ansary et al., 2021) This observation examines the relationship between the Human Development Index (HDI) and nearby improvement in West Sulawesi Province using panel records analysis and the 2-stage Least square (2SLS) approach. Secondary information from the principal records business enterprise (BPS) of West Sulawesi is employed, inclusive of variables consisting of life expectancy, education indicators, purchasing power index (PW), poverty, unemployment, regional inequality, and Gross regional home Product (GRDP). The evaluation shows that the PW variable has a partially negative effect on HDI, although now not statistically huge at 5%, it becomes massive at 20%. Conversely, the HDI variable

demonstrates a partially bad impact on PW, though now not statistically large at 5%. Excessive R² values in each equation suggest that variables like PW, existence expectancy, schooling signs, poverty, unemployment, regional inequality, and GRDP affect both HDI and PW. This shows a simultaneous relationship between HDI and nearby development in West Sulawesi Province. the examination underscores the interconnected nature of human development and regional development elements, emphasizing the importance of complete strategies to address each component simultaneously for holistic improvement in the region.

(Polat & Çil, 2024) This examination investigates the relationship between monetary improvement and environmental pleasant using the Environmental Kuznets Curve (EKC) hypothesis. not like conventional strategies that rely on the GDP boom, it utilizes the Human improvement Index (HDI) as a measure of improvement. Panel statistics from 39 nations spanning 1993 to 2018 are analyses, which specialize in methane (CH₄) and carbon (CO₂) emissions as measures of pollution. using constant impact and sturdy estimation panel facts fashions, in conjunction with the U-check method, the examine empirically examines the validity of the EKC hypothesis. effects indicate strong proof assisting an inverted U-shaped dating between CO₂ emissions and human development, suggesting that as countries broaden, CO₂ emissions initially rise, then decline. however, findings for CH₄ emissions yield mixed effects. the observation identifies a poor relationship between environmental-associated technological innovation and pollutant emissions (CH₄ and CO₂), underscoring the importance of promoting modern technology to combat worldwide warming. the observation underscores the importance of sustainable improvement desires via exploring the complicated interplay among economic increase, human development, and environmental first-rate, providing insights into the ability pathways towards accomplishing a more sustainable destiny.

(Syofya, 2018) The study the objectives are to delve into the intricate courting among poverty, the financial boom, and the Human Development Index (HDI) in Indonesia. Employing econometric techniques, which include panel information evaluation, the study examines how variations in poverty charges and monetary increases affect the HDI, a crucial indicator of human well-being. Principal to the evaluation are key variables consisting of poverty rates, GDP per capita, and the HDI, encompassing crucial dimensions like existence expectancy, schooling, and income. This paper probably offers empirical findings detailing the quantity to which changes in poverty degrees and monetary increases impact the HDI in Indonesia. This includes quantifying the importance and route of those effects and assessing their statistical significance. Importantly, the study holds sizable coverage implications, supplying precious insights for policymakers looking to devise effective techniques for boosting human improvement results. This study offers hints for poverty remedy measures, stimulating financial increases, and fostering initiatives to bolster human improvement, these studies contribute significantly to the discourse on improvement economics in Indonesia.

(Amaluddin Amaluddin¹ et al., 2018) This observation has introduced MHDI and poverty within the villages of Indonesia. They take a look at aimed to increase a new HDI composite index with the assistance of the major element evaluation approach. This take a look at has used a concern scale to cluster the village right into a high, medium, and low cluster to specify development needs. additionally, this has used panel facts to research the impact of MHDI on poverty. This observation also took into account the impact of HDI indicators on poverty. So this observation has observed that MHDI and poverty have a bad relationship so we can say that if MHDI has been increasing then poverty will lower. moreover, this look has additionally located that HDI indicators have a negative effect and DCR has a high-quality impact. finally, this has a look at has stated that if human development has to be enhanced one key success is poverty discount.

(Ipmawan et al., 2022) This examination has proposed to peer the connection between HDI, Unemployment, Illiteracy on poverty in Indonesia. To study this relationship this have a look at has taken a stepwise approach. To conduct this have a look at data gathered from secondary assets from the vital data organization (BPS). To investigate this study has used a couple of regressions with SPSS 20 software and checked the multicollinearity, autocorrelation, normality, and heteroskedasticity. the study has observed that the extent of HDI with increasing unemployment has no longer been capable of removing the poverty trouble in this examination. intending to clear up this hassle poverty has to be decreased.

(Hasanah et al., 2021) The paper's objectives are to research how the Human Development Index (HDI) impacts the poverty level in Indonesia, spotting HDI's importance as a pivotal measure of human well-being. employing penalized basis spline nonparametric regression methodology allows for a flexible examination of the HDI-poverty relationship, keeping off rigid assumptions about its useful form. Drawing from diverse information assets which include legitimate facts and surveys, the look at likely encompasses HDI ratings and poverty charges throughout varied Indonesian areas or timeframes. via meticulous nonparametric regression evaluation, the authors scrutinize the association between HDI fluctuations and changes in poverty levels, potentially uncovering the quantity to which HDI improvements correspond to poverty relief. The paper's findings hold promise for informing policymakers and practitioners on targeted interventions to fight poverty, leveraging improvements in HDI additives like training, earnings, and health. In the end, the paper underscores the significance of know-how and the nuanced interplay between HDI and poverty, suggesting avenues for destiny research to deepen comprehension of this crucial dating in Indonesia's improvement landscape.

(Levine, 2007) This paper makes use of a capability technique to examine modern-day degrees and current traits in socioeconomic improvement and poverty in Namibia. based totally on professional national data assets some especially adjusted for this analysis by using the significant Bureau of Records the Human Development Index (HDI) and Human Poverty Index (HPI) for Namibia are computed and analyzed. A vital locating is that opposite to the targets of imaginative and prescient 2030, human development in Namibia seems to be on a long-term decline. The HDI is being pulled down through a fall in lifestyle expectancy this is best partly offset through enhancements in household profits and educational attainment; the other dimensions of human development are protected in the index. The principal cause for the reduction in life expectancy is the extended mortality because of the HIV/AIDS epidemic. The evaluation additionally famous awesome inequalities in human improvement among one-of-a-kind administrative areas of Namibia. similarly, by broadening the definition of poverty to attention to deprivation in several important abilities, the level of human poverty in Namibia is discovered to be barely higher than what is usually recommended with the aid of official income poverty measures. furthermore, earnings poverty seems to be reducing at the same time as human poverty is growing over time. again it's miles the HIV/AIDS epidemic, through its poor impact on survival, that's propelling a protracted-term deterioration in human poverty. extra analysis suggests that when the use of population length and HDI as allocation criteria the administrative regions with the greatest needs are beneath - prioritised within the development price range.

(Renjati et al., 2023) This study has a look at examines the interplay between poverty, the Human Development Index (HDI), and the economic boom on a macro level. using the Vector Autoregressive/ Vector blunders Correction version, it investigates the relationships amongst family income consistent with per capita, network education stage, poverty, and economic increase. Quantitative records from legitimate authorities shape the basis of the evaluation,

employing panel data regression strategies. Stationarity and cointegration tests are carried out to ensure robustness inside the evaluation. The findings screen a significant relationship between the variables: financial boom is inspired by the aid of the HDI, which in flip impacts poverty tiers. furthermore, poverty has a discernible impact on monetary growth. consequently, the study concludes the presence of a unidirectional causality among the HDI, monetary boom, and poverty. In essence, they have looked at the difficult dynamics among human development, economic progress, and poverty discount, underscoring the significance of addressing those factors holistically in improvement strategies.

(Mad et al., 2019) This has a look at investigating the relationship between schooling, fitness, and financial dimensions of the Human Development Index (HDI) and their subsequent effect on poverty. utilizing panel records from districts and municipalities in Southeast Sulawesi from 2010 to 2018, the studies employ the Partial Least Square (PLS) approach within a structural equation version for analysis. The findings advocate that the HDI negatively and drastically influences poverty in Southeast Sulawesi. In a few of the 3 dimensions analyzed, schooling emerges as the dominant issue influencing the region's HDI and poverty tiers. In essence, they have a look at underscores the pivotal position of education in using human development and mitigating poverty in Southeast Sulawesi. It gives precious insights for policymakers and stakeholders, highlighting the importance of focused interventions to improve educational results and foster sustainable improvement and poverty discount inside the region.

(Afandi et al., 2023) This study has the motive of seeing the effect of the DCR and intercourse ratio on monetary growth and HDI. This takes a look at has used two strategies, partial and simultaneous. This study has completed different est for regression analysis like normality, heteroskedasticity, and multicollinearity through the use of VIF function autocorrelation. They

have a look at findings that DCR and intercourse ratio have substantial outcomes on HDI and economic growth.

(Ilmiyarni et al., 2023) This ambition is to research the influencing factors of poverty in Indonesia. This observation has the direct and indirect results of education and dependency ratio on financial increase and poverty. For this observation, all statistics are from secondary sources like BPS, information from Indonesia, and country-wide and global journals. This look has used pass-sectional and time series information. to check the speculation course evaluation was used. So, take a look at what has highlighted the significance of schooling and economic increase effects in lowering poverty. DCR has a negative large impact on both monetary growth and poverty. This takes a look at has provided precious insight to policymakers to deal with poverty through centered intervention in education and monetary improvement.

CHAPTER III

3. METHODOLOGY

3.1. Data and Variables

Data have been collected from secondary sources for 12 years from 2010-2021. for the study 4 countries have been selected based on human development range. According to the data availability, the variables that have been included in the study like Education, Health, Income, Democracy, Employment to population ratio, non-vulnerable employment to total employment, and Environment.

Table No:3.1. Dimensions and Indicators of MHDI

sr.no	Dimensions	Indicators
1	Health	Life expectancy
2	Education	The mean year of schooling Expected year of schooling
3	Income	GNI
4	Freedom	Democracy
5	Employment	Employment to population ratio. Non-vulnerable employment to total employment.
6	Environment	Forest area CO2 emission

Source: Prepared by author

3.1.1 Health Index: This index is measured in terms of life expectancy at birth, which indicates how many years a person expects can live a healthy life. in this study, the maximum value is 85 years, and 25 years is the minimum as taken.

3.1.2. Education Index: To measure Education study has included:-

The mean of years of schooling for adults aged 25 years and more calculated taken, this study has taken maximum and minimum values of 15 and 0 respectively.

The expected years of schooling for children of school entering an age taken into the study with a maximum value of 18 years and a minimum of 0.

3.1.3. Income index: This is measured by GNI per capita which reflects an average number of income of individuals in a country. To evaluate we have to use a logarithm of income.

3.1.4. Democracy: Democracy refers to the extent to which a country's political system allows free and honest elections, protects civil liberties, promotes political participation, and upholds the rule of law. The EIU's Democracy Index is one of the most important measures of democracy. It assesses the state of democracy in nations based on elements including electoral strategies and pluralism, functioning of government, political participation, political subculture, and civil liberties. The index gives a complete analysis of the excellence of democracy in special countries, bearing in mind comparisons and insights into worldwide tendencies in governance and political freedoms. To see if nations are democratic a scale of 0-10 has been used. 0 indicate undemocratic and 10 indicates highly democratic.

3.1.5. Employment: To measure employment this study includes two indicators,

The employment-to-population ratio: provides insight into the proportion of a country's population that is engaged in economic activity. It involves individuals aged 15 and above who

are either working or are temporarily absent from a job due to reasons such as illness or vacation. This ratio is calculated by dividing the total number of employments by the total working-age population

Non-vulnerable employment: Vulnerable employment refers to people who work for themselves or in family businesses. This includes those who might not have stable jobs or steady incomes. This is calculated by dividing the number of own-account workers plus the number of contributing family members by total employment. From vulnerable employment, we have to calculate non-vulnerable employment by subtracting vulnerable employment from 100.

3.1.6. Environment: This study has included environment as another dimension constituting two measures :-

Co2 Emission: Carbon dioxide emissions come from burning fossil fuels like coal, oil, and gas, as well as making cement. This includes the CO₂ released when we use solid, liquid, and gas fuels. This has been included using maximum and minimum values of 7.75 and 0 respectively.

Forest area: Forest area refers to land covered by trees that are at least 5 meters tall, whether they grow naturally or are planted by humans. This definition excludes trees in agricultural settings like fruit plantations and agroforestry systems, as well as those in urban parks and gardens. This indicator is calculated by dividing the total area under the forest of a country by the country's total land area and multiplying by 100. Maximum and minimum values of 98 and 0 respectively have been used.

3.2 Data Sources

HDI consists of three main dimensions: Education, Health, and Income are data collected from UNDP.

Democracy data has been collected from EIU reports.

Both Employment data are collected from World Development Indicators (WORLD BANK).

The environment has been taken from World Development Indicators (WORLD BANK).

Table No:3.2. Data sources

sr.no	Dimensions	Data sources	Links
1	Health	UNDP	https://hdr.undp.org/data-center/human-development-index#/indicies/HDI
2	Education	UNDP	https://hdr.undp.org/data-center/human-development-index#/indicies/HDI
3	Income	UNDP	https://hdr.undp.org/data-center/human-development-index#/indicies/HDI
4	Democracy	EIU	https://www.eiu.com/n/
5	Employment	WB, WDI	https://data.worldbank.org/indicator
6	Environment	WB, WDI	https://data.worldbank.org/indicator

Source: Prepared by author

3.3 Methodology

This study consisted of quantitative data and information. HDI is a composite index which is widely accepted by many countries. To improve HDI, this study has modified HDI by incorporating new dimensions (Democracy, Environment, and Employment). According to the standard framework of the HDI index formula to compute the dimensions.

$$\text{subindex} = \frac{(\text{country score} - \text{minimum value})}{(\text{Maximum value} - \text{minimum value})}$$

Table no 3.3.1. The maximum and minimum value

Indicators	Maximum value	Minimum value
Life expectancy	85	25
The mean year of schooling	15	0
The expected year of schooling	18	0
GNI per capita	\$75000	\$100
Democracy	9.98	1.08
Employment to population ratio	90.1	29
Non-vulnerable employment to total employment	98	5
Co2 emission	7.76	0
Forest area	98	0

Source: Based on the author's computation

To calculate the modified index of human development, we propose the use of the existing formula of HDI, this method is more reliable for calculating modification and entails incorporating subindices into the HDI: democracy, employment, and non-vulnerable employment, and environment calculated in the same manner as the education and health subindices. To achieve the desired objective of the study data has been used from secondary sources like UNDP, WORLD BANK, and EIU—the modification of HDI with special reference to India. To construct the MHDI the existing formula of HDI has been used. This method is widely used by many countries to calculate MHDI. Different statistical tools are used such as a line graph and t statistics.

$$\sqrt[7]{\text{Health} * \text{Education} * \text{Income} * \text{Democracy} * \text{Employment to population ratio} * \text{Non vulnerable employment} * \text{Environment}}$$

To achieve the study's objectives that comparing and measuring the progress of human development in India and to see the present status, to achieve this, panel data regression analysis was used, to see statistically significant differences between India and the selected countries. For this, all data is collected from secondary sources. in panel data regression, two methods have been used: pooling, fixed effect, and corrective measures.

To assess the impact of sub-indices on the MHDI, the following equation has been regressed;

$$\text{MHDI}_{it} = \beta_0 + \beta_1 \text{Democracy}_{it} + \beta_2 \text{Health}_{it} + \beta_3 \text{Education}_{it} + \beta_4 \text{Income}_{it} + \beta_5 \text{Employment-to-population-ratio}_{it} + \beta_6 \text{non-vulnerable employment}_{it} + \beta_7 \text{Environment}_{it} + \varepsilon_{it}$$

the "i" subscript depicts the country, and "t" denotes the time (years). α is the intercept, β 's are the coefficients of the respective explanatory variable, MHDI is the Modified Human Development Index, and ε is the random error. To explore the correlation between MHDI and HDI of India and other selected countries Binary correlation was conducted by using R-Studio.

3.3.2. Pooled OLS refers to a method of estimating the parameters of a linear regression model when data from multiple sources or groups are pooled together. In this method, cross-sectional and time series data are neglected.

3.3.3. Fixed Effect Model: The fixed effect model estimates the relationship between variables while accounting for the unique characteristics of each individual or group, treating them as fixed and not subject to change throughout the analysis. This allows researchers to isolate the impact of other variables of interest without being confounded by the specific characteristics of the individuals or groups being studied.

3.3.4. Selection of the model

To select between pooled and fixed pFtest conduct, it is an F-test has been conducted to see pooled or fixed effect method applies to the model.

3.3.5. Test for Autocorrelation and Heteroskedasticity

Autocorrelation:- Autocorrelation is a statistical concept that evaluates the similarity between a time series and its lagged version, examining if there's a correlation between values at different time points. The autocorrelation is measured with the Autocorrelation Function (ACF) measures these correlations at various time lags, The Partial Autocorrelation Function (PACF), and the Durbin-Watson Test detect autocorrelation in regression residuals. Values near 2 imply no autocorrelation, while deviations indicate positive or negative autocorrelation, and the

Breusch-Godfrey Test which used in regression residuals to identify higher-order autocorrelation by including lagged dependent variables in the model.

Heteroskedasticity:- Heteroskedasticity is a statistical concept that refers to the unequal variability of errors or residuals in a regression model. This violates the assumption of homoscedasticity, in which the variance of the mistakes is constant across all degrees of the impartial variables. To measure this Breusch-Pagan test and white test are used.

3.3.6. Remedial solution

Robust cluster standard errors are a statistical method used in regression analysis to address potential issues with standard errors when clustering within the data. Clustering occurs when observations within the dataset are not independent, but rather grouped or correlated in some way.

CHAPTER IV

4. ANALYSIS

The Human Development Index is calculated by the UNDP, taking into account three main factors: education, health, and income. Meanwhile, the Modified Human Development Index (MHDI) expands upon this by incorporating new dimensions like Employment, Environment, and Democracy. So, this table presents the calculated MHDI and HDI values for India, Switzerland, Indonesia, and Sudan nations from 2010 to 2021, with values ranging from 0 to 1. Higher values indicate a country's higher level of human development, while lower values suggest comparatively lower human advancement.

Table No:- 4.1. MHDI

Count ries	INDIA			INDONESIA			SWITZERLAND			SUDAN		
Year	MHDI	H DI	AD	MHD I	H DI	AD	MHD I	H DI	AD	MHD I	H DI	AD
2010	0.39472 0308	0.5 75	- 0.18027 9692	0.559 018	0.6 64	- 0.10 498	0.804 274	0.9 42	- 0.13 773	0.287 894	0.4 86	- 0.19 811
2011	0.40447 9692	0.5 88	- 0.18352 0308	0.571 254	0.6 71	- 0.09 975	0.798 678	0.9 43	- 0.14 432	0.283 122	0.4 87	- 0.20 388
2012	0.41538 634	0.5 98	- 0.18261 366	0.583 814	0.6 78	- 0.09 419	0.801 374	0.9 45	- 0.14 363	0.282 164	0.4 93	- 0.21 084

2013			-			-			-			-
	0.42050	0.6	0.18649	0.584	0.6	0.09	0.803	0.9	0.14	0.288	0.4	0.20
	3827	07	6173	296	83	87	2	48	48	349	97	865
2014						-			-			-
	0.42865	0.6	0.19034	0.589	0.6	0.09	0.797	0.9	0.15	0.290	0.5	0.21
	7723	19	2277	209	87	779	724	52	428	661	04	334
2015			-			-			-			-
	0.43013	0.6	0.19886	0.595	0.6	0.09	0.797	0.9	0.15	0.288	0.5	0.21
	312	29	688	697	95	93	671	54	633	329	08	967
2016			-			-			-			-
	0.43439	0.6	0.20460	0.594	0.6	0.10	0.799	0.9	0.15	0.290	0.5	0.22
	2016	39	7984	791	99	421	5	56	65	512	11	049
2017			-			-			-			-
	0.42817	0.6	0.21582	0.589	0.7	0.11	0.796	0.9	0.16	0.283	0.5	0.23
	272	44	728	83	04	417	871	57	013	215	14	078
2018			-			-			-			-
	0.42921	0.6	0.21578	0.593	0.7	0.11	0.795	0.9	0.16	0.282	0.5	0.23
	7106	45	2894	837	1	616	34	59	366	963	14	104
2019			-			-			-			-
	0.43759	0.6	0.20740	0.601	0.7	0.11	0.796	0.9	0.16	0.299	0.5	0.21
	494	45	506	214	16	479	138	62	586	763	14	424
2020			-			-			-			-
	0.41759	0.6	0.22440	0.588	0.7	0.12	0.784	0.9	0.17	0.287	0.5	0.22
	4141	42	5859	179	09	082	267	56	173	97	1	203

2021			-			-			-			-
	0.42556	0.6	0.20743	0.590	0.7	0.11	0.783	0.9	0.17	0.283	0.5	0.22
	8612	33	1388	908	05	409	63	62	837	504	08	45
Average Values for the period 2010-2021												
MHD	0.422201712			0.586837			0.796556			0.287371		
I												
HDI	0.622			0.693417			0.953			0.503833		

Source: Based on the author's calculation, by UNDP

The provided table presents the Modified Human Development Index (MHDI) and Human Development Index (HDI) values for India, Indonesia, Switzerland, and Sudan nations over 12 years. On average, India shows MHDI values around 0.422201712 and HDI values around 0.622. Similarly, the average HDI values for Indonesia, Switzerland, and Sudan were approximately 0.693, 0.953 and 0.503 respectively. However, with proposed modifications aiming to provide a more comprehensive depiction of human development, the HDI values were adjusted to 0.586, 0.796, and 0.287 for Indonesia, Switzerland, and Sudan, respectively, upon incorporating MHDI. These adjustments offer a more exact understanding of the human development landscape across these nations.

4.2. To investigate the difference between MHDI and HDI t-tests: Two-Sample Assuming Equal Variances are conducted.

4.2.1.T-Statistics for India

	<i>MHDI</i>	<i>HDI</i>
Mean	0.422201712	0.622
Variance	0.000156928	0.0005978
Observations	12	12
Pooled Variance	0.000377373	
Hypothesized Mean Difference	0	
Df	22	
t Stat	-25.19312059	
P(T<=t) one-tail	5.09566E-18	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	1.01913E-17	
t Critical two-tail	2.073873068	

Source: Based on the author's computation

The p-values extremely low which indicates strong evidence against the null hypothesis. The null hypothesis typically states that there is no difference between the means of the two groups (MHDI and HDI). Since the p-values are much smaller than the significance level, we reject the null hypothesis. So there is strong evidence that suggests a statistically significant difference between the MHDI and HDI in terms of their means in India

4.2.2.T-Statistics for SWITZERLAND

	<i>MHDI</i>	<i>HDI</i>
Mean	0.796556	0.953
Variance	4.21E-05	4.95E-05
Observations	12	12
Pooled Variance	4.58E-05	
Hypothesized Mean Difference	0	
Df	22	
t Stat	-56.6536	
P(T<=t) one-tail	1.23E-25	
t Critical one-tail	1.717144	
P(T<=t) two-tail	2.46E-25	
t Critical two-tail	2.073873	

Source: Based on the author's computation

The p-values extremely low which indicates strong evidence against the null hypothesis. The null hypothesis typically states that there is no difference between the means of the two groups (MHDI and HDI). Since the p-values are much smaller than the significance level, we reject the null hypothesis. The strong evidence suggests a statistically significant difference between the MHDI and HDI in terms of their means in Switzerland.

4.2.3.T-Statistics for INDONESIA

	<i>MHDI</i>	<i>HDI</i>
Mean	0.586837	0.693417
Variance	0.000133	0.000278
Observations	12	12
Pooled Variance	0.000206	
Hypothesized Mean Difference	0	
Df	22	
t Stat	-18.202	
P(T<=t) one-tail	4.73E-15	
t Critical one-tail	1.717144	
P(T<=t) two-tail	9.45E-15	
t Critical two-tail	2.073873	

Source: Based on the author's computation

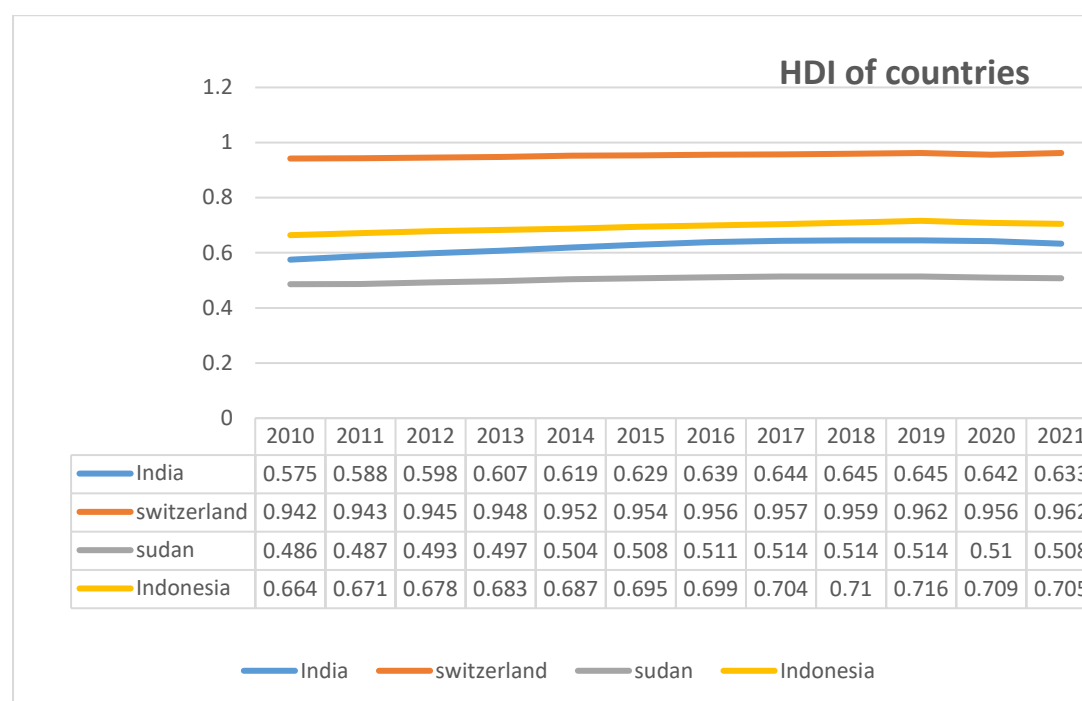
The p-values extremely low which indicates strong evidence against the null hypothesis. The null hypothesis typically states that there is no difference between the means of the two groups (MHDI and HDI). Since the p-values are much smaller than the significance level, we reject the null hypothesis. The strong evidence suggests a statistically significant difference between the MHDI and HDI in terms of their means in Indonesia

4.2.4. T-Statistics for SUDAN

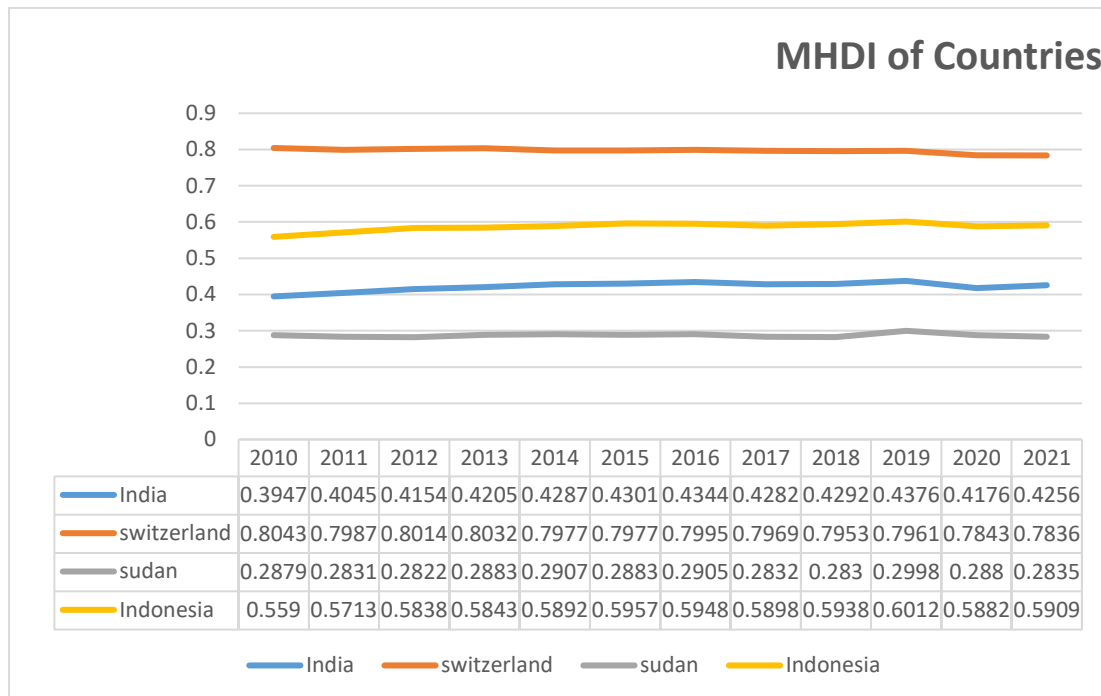
	<i>MHDI</i>	<i>HDI</i>
Mean	0.287722	0.503833
Variance	2.57E-05	0.000109
Observations	11	12
Pooled Variance	6.94E-05	
Hypothesized Mean Difference	0	
Df	21	
t Stat	-62.157	
P(T<=t) one-tail	1.35E-25	
t Critical one-tail	1.720743	
P(T<=t) two-tail	2.7E-25	
t Critical two-tail	2.079614	

Source: Based on the author's computation

The p-values extremely low which indicates strong evidence against the null hypothesis. The null hypothesis typically states that there is no difference between the means of the two groups (MHDI and HDI). Since the p-values are much smaller than the significance level, we reject the null hypothesis. The strong evidence suggests a statistically significant difference between the MHDI and HDI in terms of their means in Sudan.

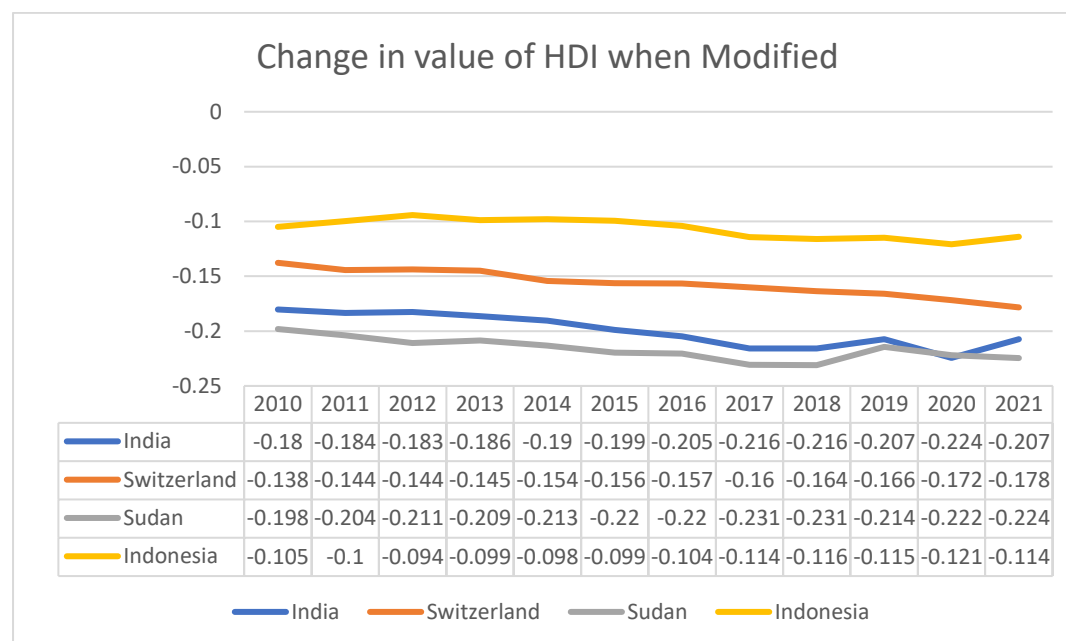
figure. 4.3. HDI of countries**Source: UNDP**

The above diagram indicates how HDI tendencies flow over the years 2010-2021. here's a summary of the traits located in the metrics for India, Switzerland, Sudan, and Indonesia from 2010 to 2021. The trend for India indicates a usually upward trend over the period, starting at 0.575 in 2010 and peaking at 0.645 in 2018. there may be a moderate fluctuation in the following years, with a lower to 0.633 in 2021. Switzerland's tendencies have grown over the years, starting at 0.942 in 2010 and accomplishing its peak at 0.962 in 2019. there is a slight lower inside the middle years, however, the overall trend is high quality. For Sudan there is a steady increase from 2010 to 2018, beginning at 0.486 and attaining 0.514. there may be little exchange, with the value last at 0.514 till 2021. Indonesia followed an upward fashion over the period, beginning at 0.664 in 2010 and achieving its maximum point at 0.716 in 2019. there's a mild decrease to 0.705 in 2021 after the peak. India, Switzerland, and Indonesia have shown effective tendencies of their HDI values through the years, with fluctuations observed in some cases. Sudan has the lowest increase in its HDI value in the course of the period.

Figure 4.4. MHDI of countries

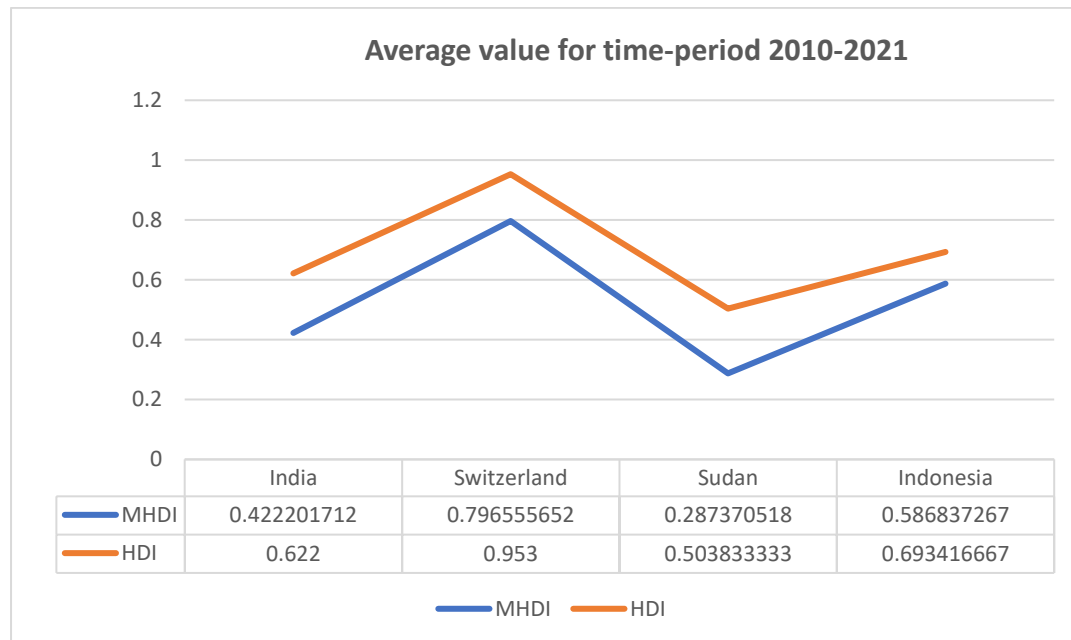
Source: Based on author's calculation

This diagram translates the developments found within the MHDI for India, Switzerland, Sudan, and Indonesia from 2010 to 2021: The MHDI score for India follows a normally growing trend through the years, starting at 0.3947 in 2010 and peaking at 0.4376 in 2019. There's a moderate lower to 0.4256 in 2021. Switzerland's MHDI score shows fluctuations through the years, beginning enormously excessive at 0.8043 in 2010 and reaching its lowest factor at 0.7836 in 2021. The MHDI score for Sudan fluctuates throughout the period, with a peak at 0.2998 in 2019. However, there's a slight lower thereafter to 0.2835 in 2021, with the general fashion being fantastically stable. Indonesia's MHDI score has generally expanded from 2010 to 2019, peaking at 0.6012, after which barely reduced to 0.5909 in 2021. Each country's MHDI value represents a unique thing, likely associated with financial overall performance, development, or different applicable elements.

Figure 4.5. Difference between MHDI and HDI

Source: Based on author's calculation

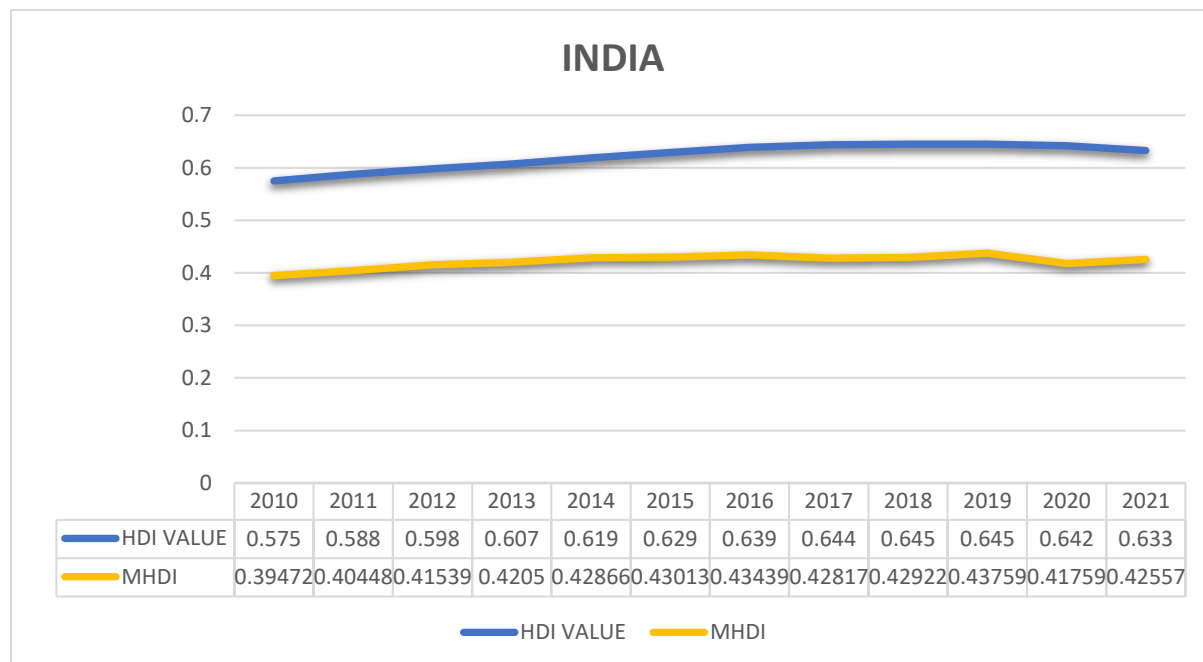
The above graph shows the absolute difference between the two indices taken into account after subtracting HDI values from MHDI scores. MHDI scores are lower than the HDI values. India has experienced the most significant decline in human development over time compared to other countries. Switzerland has experienced the smallest decline in human development values among the other countries. Indonesia's value starts showing fluctuations over the years. Sudan has shown a relatively smaller fall in values compared to India, Switzerland, and Indonesia.

Figure. 4.6. Average value of MHDI and HDI

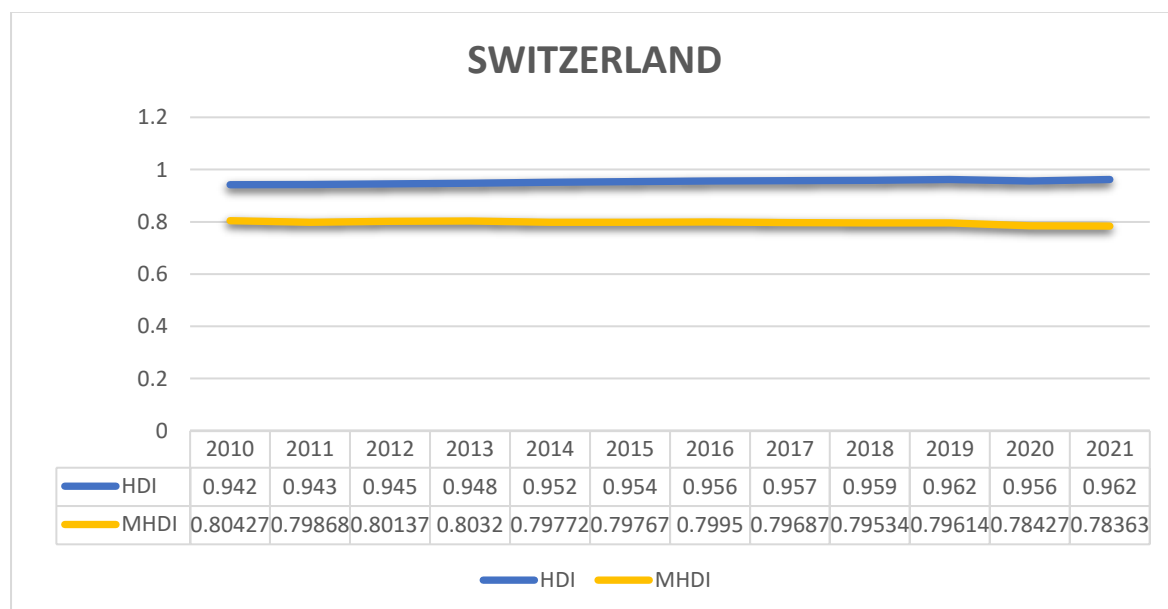
Source: Based on author's calculation

The above diagram shows the average level of human development in selected countries. India's MHDI is significantly lower than its HDI. This suggests that certain adjustments or factors considered in the MHDI calculation lead to a lower assessment of human development compared to the traditional HDI. Switzerland's MHDI is marginally lower than its HDI, implying that the adjustments incorporated into the MHDI computation only minimally affect Switzerland's assessment of human development. Consequently, there's a slight reduction in Switzerland's human development index when comparing the MHDI to the conventional HDI.

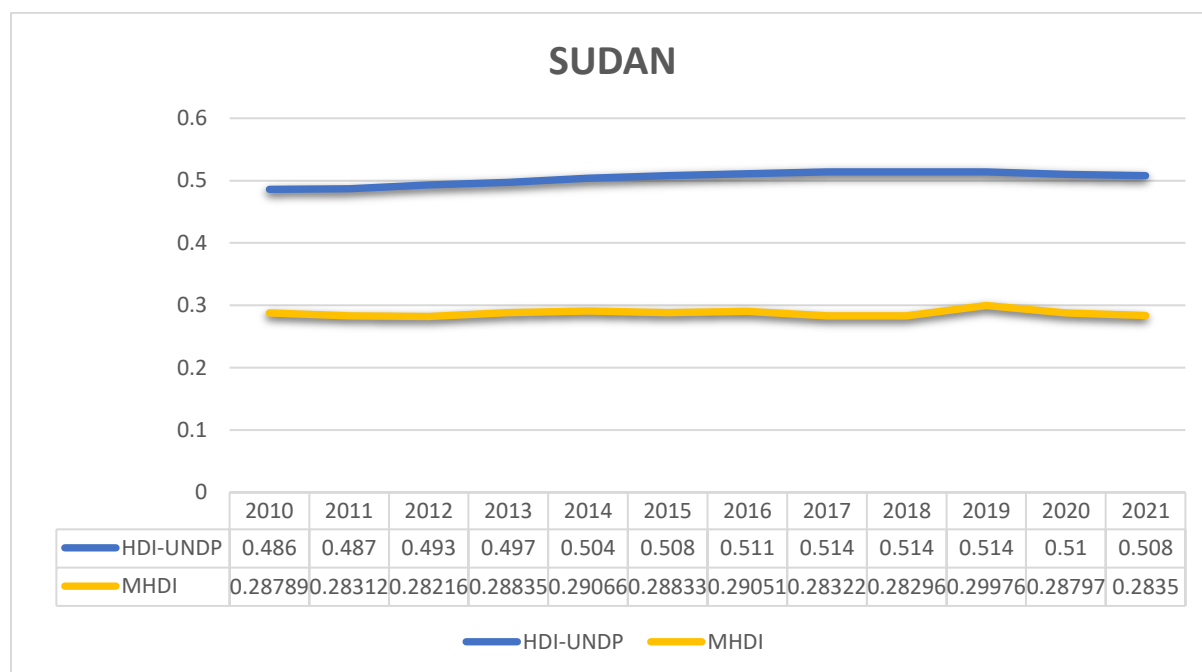
Sudan's MHDI significantly trails its HDI, indicating that the modifications in the MHDI calculation markedly diminish the evaluation of human development in Sudan compared to the conventional HDI. In Indonesia, the MHDI is just a bit lower than the HDI. This suggests that changes made in calculating the MHDI only slightly affect Indonesia's human development index, leading to a small decrease compared to the traditional HDI.

Figure 4.7. MHDl and HDI for INDIA

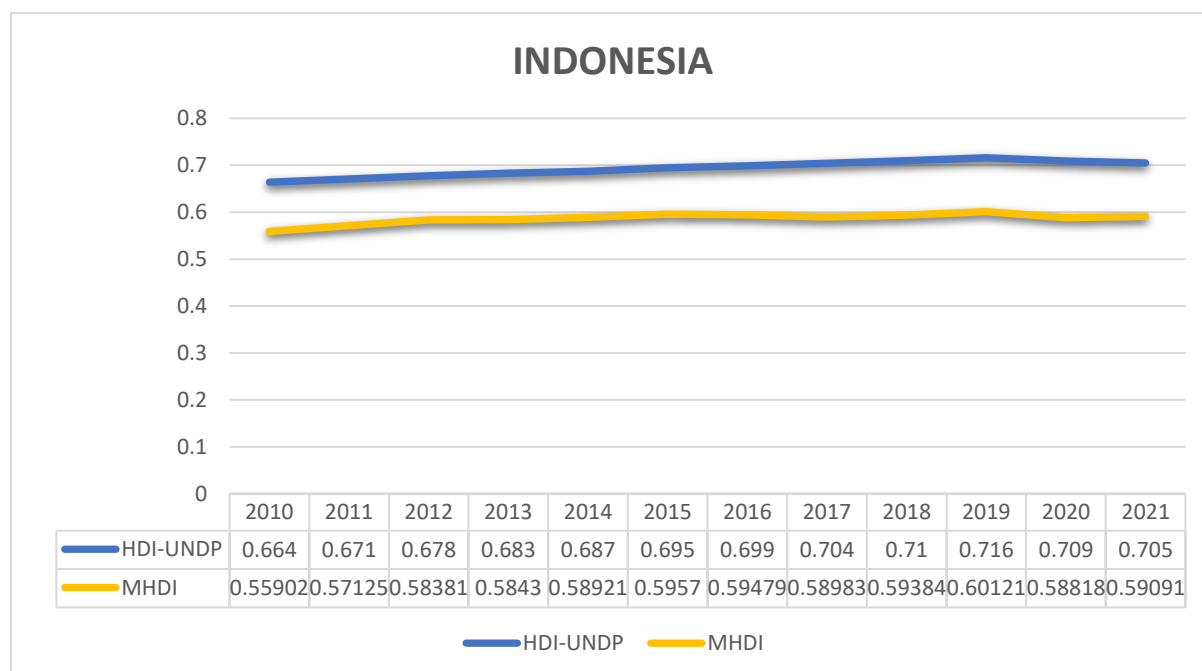
Source: Based on author's calculation

Figure 4.8. MHDl and HDI for SWITZERLAND

Source: Based on author's calculation

Figure:4.9 MHDI and HDI for SUDAN

Source: Based on author's calculation

Figure:4.10 MHDI and HDI for INDONESIA

Source: Based on author's calculation

This graph shows each nation's HDI and MHDI values from 2010-2021. All four countries' MHDI values are lower than HDI values. Over 12 years, MHDI and HDI values have increased. MHDI and HDI values are highest for Switzerland compared to the other three countries, so Switzerland has very high development followed by Indonesia, India, and Sudan. Sudan has a low human development. If comparison between MHDI and HDI for these countries reveals similarities and differences in their trends. So, it shows an overall improvement in human development for all countries over the years for both MHDI and HDI.

4.11. Regression analysis

For analysis, this study has used panel data. This study has investigated the significant differences in rank between MHDI and HDI over the years for India and also for other selected countries. To estimate the results all accepted methods such as pooling Ols and fixed effect are used. To select the best model this study has used the pFtest. Since the p-value is less than the significance level, we reject the null hypothesis. This indicates that there are significant differences in the fit between the model with individual effects and the model with pooled effects. the individual-specific effects significantly improve the model's fit compared to a model with pooled effects, suggesting that the individual effects are important for explaining the variability in the MHDI. Therefore, it is appropriate to use the fixed effects model over the pooling model in this result. This results in the Favor of FEM.

Table No:- 11.9.1.Regressing sub-indices on MHDI

Variables	Coefficient	p-value
The dependent variable is MHDI		
Democracy	0.111*** (0.024)	0.0001137
Education	0.196** (0.084)	0.0283859
Income	0.282*** (0.072)	0.0006025
Health	0.211*** (0.055)	0.0006862
VI	0.063 (0.086)	0.4676108
EI	0.168*** (0.031)	9.635e-06
Environment	0.239*** (0.054)	0.0001657
R-Squared: 0.94985 Adj. R-Squared: 0.90934		
F-statistic: 27.3558 p-value: 1.7659e-12		

Source: Based on the author's computation.

In the fixed effects model, the coefficients represent the change in the MHDI associated with a one-unit change in the corresponding independent variable, while controlling for individual-specific effects. In a fixed effects model, the year effects are absorbed by the individual fixed effects, so these coefficients are not as interpretable as in other models, so most year coefficients have p-values greater than 0.05, indicating that they are not statistically significant. These coefficients represent the change in MHDI associated with a one-unit change in each respective independent variable. The R-squared value (0.94985) suggests that approximately 94.985% of the variance in the MHDI is explained by the independent variables in the model, after accounting for individual-specific effects. The F-statistic (27.3558) tests the overall significance of the model, with a p-value of 1.7659e-12 indicating that the model is statistically significant. These fixed effects model provides insights into the relationships between the independent variables and MHDI while controlling for individual-specific effects, as well as the overall fit of the model.

After this, I did a test to see the problem of serial correlation and heteroskedasticity by using pbgttest and bptest.

Table No:11.9.2. Testing Autocorrelation and Heteroskedasticity

	P-value
Autocorrelation	0.01255
Heteroskedasticity	0.04316

Source: Based on the author's computation

Based on this test results(p-value) suggest that there is a problem with serial correlation and heteroskedasticity. Finally, to address this issue of this, a robust cluster standard error method is used.

Table No.4.11.3. Corrected Model

Variables	Coefficient	p-value
The dependent variable is MHDI		
Democracy	0.111*** (0.02990543)	0.0009742
Education	0.196* (0.07941405)	0.0207222
Income	0.282. (0.15032861)	0.0717296
Health	0.211*** (0.0408377)	2.131e-05
VI	0.063 (0.13588294)	0.6455159
EI	0.168*** (0.00593160)	< 2.2e-16
Environment	0.239*** (0.04238336)	6.163e-06

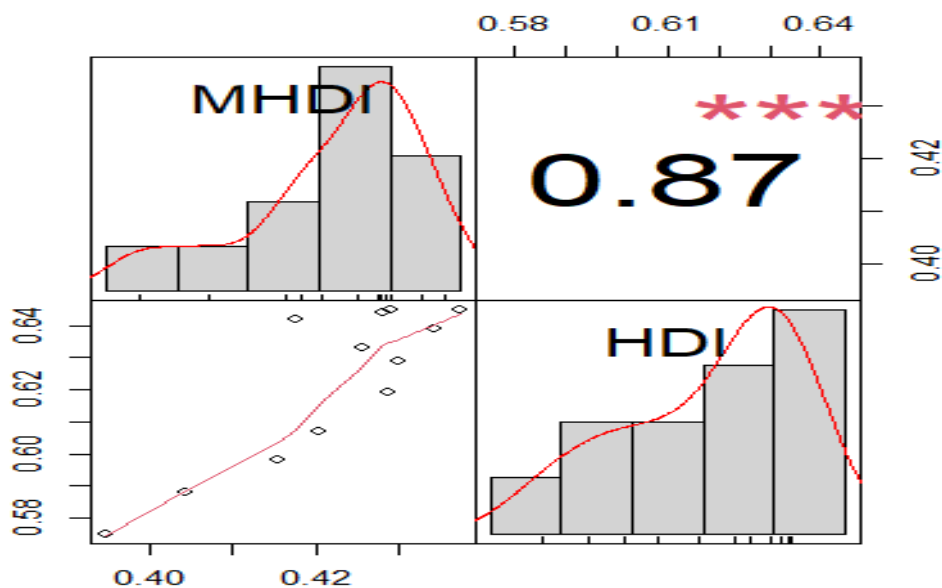
Source: Based on the author's computation

The coefficients for Democracy, Education, Income, Health, and Environment are statistically significant at regular levels. This suggests that these variables have a statistically significant impact on MHDI. The coefficient for the Employment population to ratio is highly significant, indicating a real impact on MHDI. These results provide insights into the statistical significance and impact of various factors on MHDI, taking into account heteroskedasticity and autocorrelation, clustering of standard errors by group (individual) will reduce the standard error, so it suggests that the corrected model is much better than the FEM.

4.12. Binary correlation

Binary correlation refers to the statistical relationship between two binary variables. Binary variables are categorical variables with only two possible outcomes or levels, often denoted as 0 and 1. Binary correlation has been used in studies to see how much MHDI's variables are correlated.¹ 1 indicates a perfect positive linear relationship, 0 indicates no linear relationship, and -1 indicates a perfect negative linear relationship.

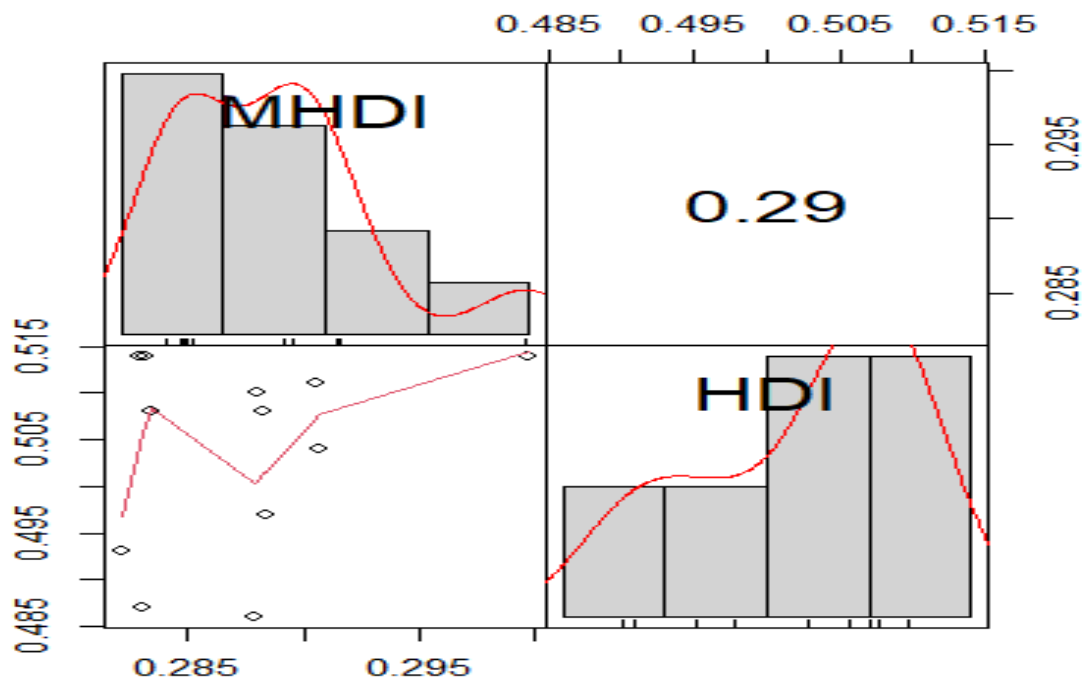
Figure 4.12.1. Binary correlation between MHDI and HDI for India



Source: Based on author's calculation

This chart provides the result of a binary correlation analysis conducted on MHDI and HDI. The correlation coefficient between MHDI and HDI is 0.87. The p-value for this correlation is statistically significant. The correlation between MHDI and HDI is positively strong, suggesting a high degree of association between the MHDI and HDI. So, this result shows changes in MHDI are closely related to changes in HDI, which will have a better understanding and analysis of human development in India.

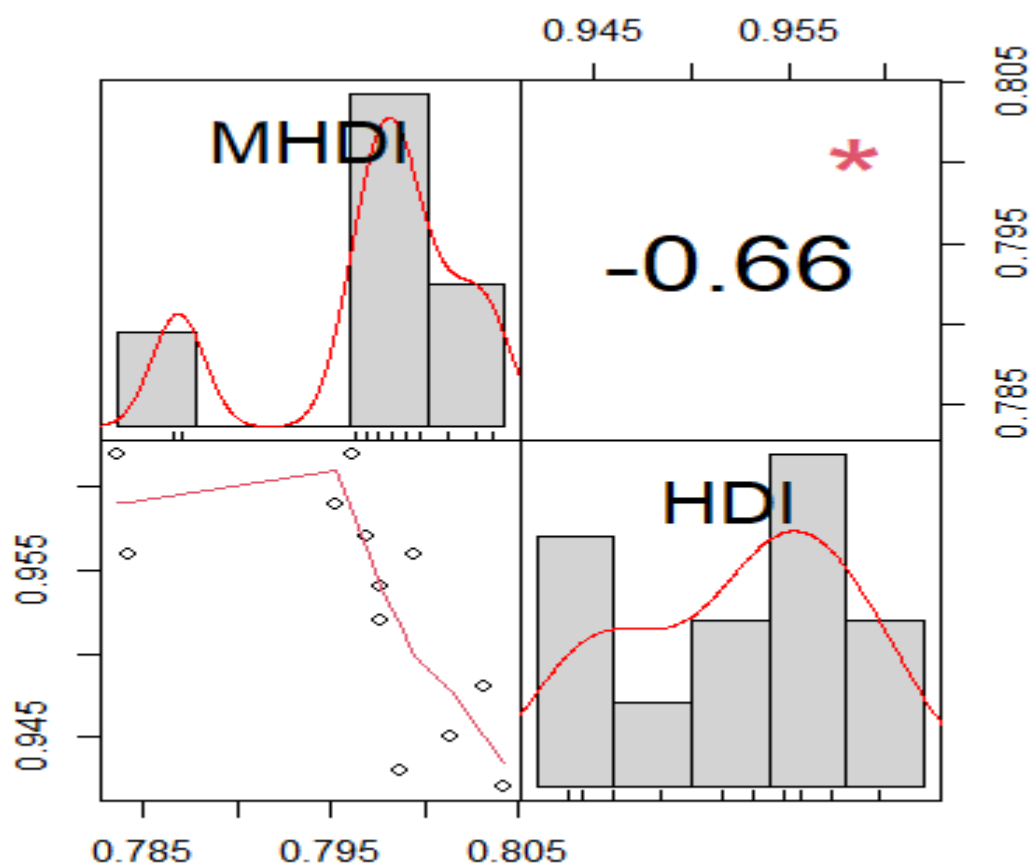
Figure .4.12.2. Binary correlations between MHDI and HDI for Sudan



Source: Based on the author's computation

This chart provides the result of a binary correlation analysis conducted on MHDI and HDI for Sudan. The correlation coefficient between MHDI and HDI is 0.29. The p-value for this correlation is not statistically significant. The correlation between MHDI and HDI is moderate, indicating a relatively weaker relationship. There is some tendency for the variables to move together, and there is also a lot of variability in their relationship.

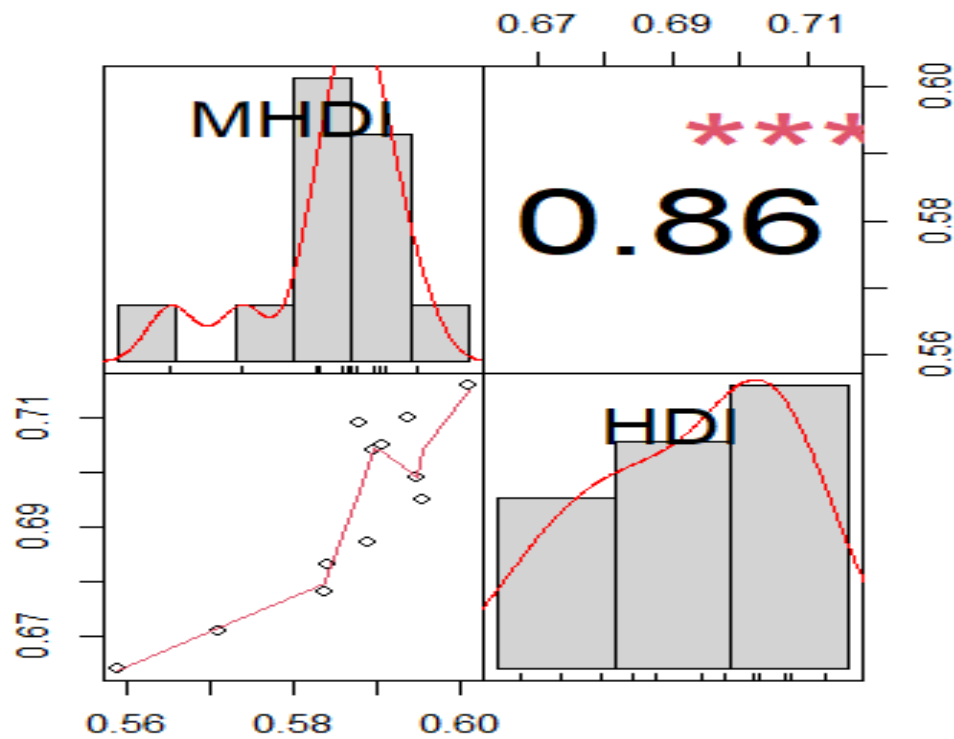
Figure 4.12.3. Binary correlation between MHDI and HDI for Switzerland



Source: Based on the author's computation

This chart provides the result of a binary correlation analysis conducted on MHDI and HDI for Switzerland. The correlation coefficient between MHDI and HDI is -0.66 . The p-value for this correlation is statistically significant. The correlation between MHDI and HDI is negative, indicating an inverse relationship between the two variables.

Figure 4.12.4. Binary correlations between MHDI and HDI for Indonesia



Source: Based on the author's computation

This chart provides the result of a binary correlation analysis conducted on MHDI and HDI for Indonesia. The correlation coefficient between MHDI and HDI is 0.86. The p-value for this correlation is statistically significant. The correlation between MHDI and HDI is a strong positive relation, suggesting a high degree of association between the MHDI and the HDI.

CHAPTER V

5. CONCLUSION

This study shows that the Human Development Index may not completely capture a picture of well-being because it focuses especially 3 fundamental indicators education, earnings, and health, you could deal with this, by a modified Human Development Index proposed for international locations by incorporating additional variables inclusive of employment, democracy, and environment. The Modified Human Development Index (MHDI) is derived from the same conceptual framework as the conventional HDI, using a geometrical average of its component subindices. MHDI no longer best gives a complete review of general improvement but also highlights nuanced factors of progress and demanding situations. The MHDI is an exceptional issue for human improvement in nations in comparison to the HDI. The MHDI yield decreased in comparison to the conventional HDI for nations over the years. This result no longer detracts from achievement in countries that have made human improvements. The study has emphasized the importance of re-addressing citizens' well-being by using thinking about employment opportunities, education, healthcare, environmental exceptional, and human values. these elements without delay or circuitously affect improvement, productivity, and boom, urging nations to replace their approach to measuring and viewing human development. MHDI has offered extra specific and particular perspectives on their strengths and weaknesses. MHDI has supplied a simple impact that highlights regions where development is wanted. Training and health are capability variables that indicate improvement in fitness and education situations. The subindices mentioned within the MHDI contribute to improvement trends and variations for gaining access to development comprehensively. The MHDI's awareness of inclusivity and sustainability aligns well with current improvement agendas, including the Sustainable development goals (SDGs). using considering a broader set of indicators, MHDI provides policymakers with treasured insights for designing and imposing rules that sell equitable and sustainable development. MHDI offers

many blessings. furthermore, information availability and pleasant problems can affect the accuracy and reliability of MHDI calculations.

MHDI will help policymakers and useful resource allocation that lets them better human well-being and sell development. MHDI framework presents an extra accurate picture of their human improvement reputation. This study takes a look at MHDI and indicates enhancements in human development over the years at some stage in the global places.

5.1. Findings of the study

The study tries to regulate the Human Development Index by incorporating new dimensions, so it could be applied to measure and compare the human development for India, Switzerland, Indonesia, and Sudan. It has been located that the MHDI rating is lower than the HDI which shows that the MHDI provides a simple impact and highlights the regions in which development is wanted. The findings of the study take a look at have revealed that there is a statistically significant difference between MHDI and HDI. There's a substantial difference between the nation's MHDI and HDI rankings.

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