

Human Development Index: History, Construction, and Possible Correction to Make It a Good Policy

Index

Enrico Carraro

Università Ca' Foscari Venezia – Ca' Foscari University of Venice

*Al mio relatore Giovanni Favero, per la sua pazienza, per i suoi
consigli, per le conoscenze trasmesse durante tutto il percorso.*

*A mio Papà, che ci ha creduto più di tutti e più di tutti ha sempre
creduto in me.*

*A mia Mamma, che più di tutti mi ha dato i mezzi e la forza per
non arrendermi.*

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necessari per la nostra famiglia mentre. Questo percorso è più
merito suo che mio.*

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Summary Of the Thesis (Italian)

Con il passare degli anni è emersa, con urgenza sempre maggiore, la necessità di individuare degli strumenti che permettessero di cogliere il benessere di persone e popolazioni al di là dei singoli indicatori di reddito quali, ad esempio, il PIL pro capite.

A partire dal 1990, quindi, l'UNDP (il programma per lo sviluppo delle Nazioni Unite), basandosi sui concetti di '*capability*' (capacità) e di importanza dei fini oltre che dei mezzi, come teorizzato principalmente dal premio Nobel Amartya Sen, ha introdotto l'Indice di Sviluppo umano (HDI). Attraverso questo indice composito l'UNDP ha tentato di investigare il concetto di '*benessere*' delle persone.

Questo indice è infatti composto da tre misuratori di, rispettivamente:

- Aspettativa di vita: H-Index;
- Scolarizzazione: E-Index;
- Reddito: Y-Index.

Dal 1990 ad oggi l'indice si è evoluto ed ha subito modifiche per venire incontro alle emergenti necessità di un mondo in evoluzione (nel 2020 ad esempio è stato introdotto l'indice di sviluppo umano nell'era dell'antropocene che calcola l'impatto dell'attività umana sull'ambiente e l'effetto retroattivo sulle popolazioni e sui settori delle popolazioni più vulnerabili). L'indice era infatti stato concepito come uno strumento vivo, che avrebbe dovuto recepire input e miglioramenti provenienti dall'esterno.

A partire dagli anni settanta e ottanta, infatti, il concetto di sviluppo è maturato includendo indicatori differenti e concentrandosi su impiego e disoccupazione, redistribuzione della ricchezza e della crescita e sulla capacità delle persone di soddisfare i propri bisogni di base. A partire da quegli anni però le disuguaglianze sono cresciute costantemente (per esempio: la differenza di reddito tra il quinto più ricco della popolazione mondiale e quello più

povero era 30 a 1 negli anni sessanta; 60 a 1 all'inizio degli anni 90; e 74 a 1 nel 1997. Da allora la situazione è peggiorata continuamente).

L'obiettivo di questo lavoro è quindi dare un ulteriore contributo alla discussione per individuare meccanismi che permettano di cogliere con maggiore accuratezza la possibilità degli individui di veder realizzate le proprie aspirazioni.

Il ragionamento alla base del presente lavoro è piuttosto semplice: si considerano accettabili gli indici relativi alla salute e scolarizzazione, ma si ritiene che sia necessario fare un lavoro di raffinamento dell'indice di benessere economico. Pertanto ai fini dell'HDI 'corretto' si considererà solamente la quota di reddito disponibile per soddisfare le proprie aspirazioni dopo averla depurata dalle spese necessarie alla mera sopravvivenza o sussistenza. Un semplice esempio di come questo possa essere necessario per capire meglio come il reddito legato alla sussistenza possa influire negativamente sulla libertà di scelta per soddisfare le proprie aspirazioni è legato al costo delle abitazioni negli Stati Uniti d'America: durante la Grande Depressione (intorno al 1929) la paga mediana annuale era circa il 22% del costo di una casa; nel 2019 questo dato è sceso al 14%. Ciò vuol dire che un cittadino statunitense è costretto, per avere un tetto sopra la testa, a lavorare maggiormente oggi che durante un periodo nero per l'economia come la Grande Depressione.

Prima di arrivare a decidere quali costi considerare ed includere in questo calcolo è stata fatta un'analisi approfondita della storia dell'Indice di Sviluppo Umano e dei suoi componenti, delle critiche che esso ha ricevuto e di come queste siano state accolte per migliorare l'indice o siano di fatto pretestuose.

Come detto infatti l'Indice di Sviluppo Umano è stato diffuso per la prima volta nel 1990 all'interno di un report delle Nazioni Unite chiamato '*Human Development Report*'. Il concetto di Sviluppo Umano è stato in qualche modo dirompente perché ha permesso da un lato a governi, ONG e ricercatori di accedere ad un ventaglio più ampio di strumenti per

misurare e comparare; dall'altro al pubblico generalista di comprendere un moderno concetto di *sviluppo*.

A partire dal 1990, infatti, per la prima volta si è confrontato il livello di reddito e benessere tra le persone e non solo tra le nazioni (la differenza tra il miliardo di persone più ricche e più povere è raddoppiato dagli anni 60 a 90 raggiungendo le 150 volte). A questo si è aggiunta l'analisi di come le disparità tra i percentili più ricchi ed i più poveri siano più accentuate nei paesi '*poveri*' o in '*via di sviluppo*'. Con gli indici ausiliari all'HDI, poi, le nazioni unite sono andate nel dettaglio di come queste differenze vadano a influire sui singoli gruppi sociali: minoranze, donne, minori ed altri a rischio maggiore vulnerabilità.

Per capire perché è importante concentrarsi sul concetto di '*capability*' è necessario discutere la definizione del concetto di utilità e come nella visione economica moderna si ritenga che la massimizzazione dell'utilità o del 'ritorno' massimizzi la felicità e la soddisfazione e come, per questo, ciò che permette di massimizzare la felicità sia ciò che permette un ritorno più alto in termine economico. Per questo, nella teoria economica neoclassica il PIL pro capite può essere una buona approssimazione della soddisfazione personale.

Al contrario, molti ricercatori contemporanei (basandosi su studi che partono dagli anni 60) hanno rivoluzionato tale visione allargando il concetto di benessere, di welfare e di soddisfazione e pertanto lavorando per trovare i migliori modi di misurare queste dimensioni. Il PIL pro capite (e indicatori simili) infatti non rivelano l'effettiva composizione di quel reddito né come sia distribuito. Inoltre, all'interno di quell'indicatore, migliori servizi sanitari e spese in armamenti hanno, ad esempio, lo stesso valore.

Il principale ideatore dell'Indice di sviluppo umano, Ul Haq, ha infatti dimostrato come alcuni paesi abbiano convertito le congiunture a loro favorevoli in guadagno permanente sacrificando in parte aumenti reddituali e finanziari per investire in capitale umano e riscoprendo che l'essere umano deve essere sia mezzo che fine dello sviluppo economico.

I tre pilastri dell'Indice di sviluppo umano quindi sono stati disegnati per garantire di focalizzarsi al massimo sul concetto di massimizzare la libertà di scelta delle persone. Per tutti gli indici è stata utilizzata una funzione concava che permetta di apprezzare il rendimento marginale decrescente del fenomeno analizzato. Nel dettaglio:

- Indice di aspettativa di vita: è stato scelto come buona approssimazione di altre importanti variabili dello sviluppo umano, quali
 - Il valore intrinseco della longevità;
 - Potrebbe aiutare le persone a perseguire obiettivi diversi e variegati;
 - Può essere associato ad altri aspetti di una vita positiva: buona salute e nutrizione.
- L'indice dell'educazione: è un indice sintetico che si concentra sugli anni attesi di scolarizzazione della popolazione giovane e gli anni di scolarizzazione delle persone anziane per cogliere sia il livello di scolarizzazione presente che quello futuro previsto.

Purtroppo questo indice non coglie aspetti quali la qualità dell'istruzione impartita, ma è comunque una buona approssimazione della possibilità di studiare della popolazione, che è il principale strumento di emancipazione per i settori più vulnerabili della popolazione.
- L'indice di standard di vita: considera il rendimento marginale decrescente del reddito in un paese. In questo modo un aumento reddituale di 100 USD in un paese il cui reddito medio pro capite è pari a 1.000 USD avrà un impatto decisamente più rilevante che in un paese in cui questi è pari a 75.000 USD.

Seguendo il concetto di perfetta sostituibilità dei componenti dell'indice, ognuna delle sue componenti pesa per un terzo del totale. Alcuni hanno criticato questa soluzione, ma sorprendentemente i risultati prodotti da tutti i metodi di peso alternativi proposti da diversi

ricercatori non differiscono particolarmente. Allo stesso modo, di fatto, esiste una correlazione quasi perfetta tra l'Indice di Sviluppo Umano classico e quello aggiustato secondo la Pressione sul Pianeta (eccetto per alcuni paesi a HDI molto alto).

Alcune critiche che sono state avanzate nei confronti dell'Indice di Sviluppo Umano riguardano: a) dati di scarsa qualità; b) indicatori sbagliati; c) specificazione errata; d) una misurazione scorretta del reddito pro capite; ed e) ridondanza. La maggior parte di queste critiche appaiono pretestuose perché l'UNDP stessa è consapevole di alcuni limiti dell'indice che però non ha la pretesa di essere in alcun modo esaustivo ed omnicomprensivo, ma ha il suo grande punto di forza nel fornire una buona rappresentazione della realtà in maniera efficace per pubblico generalista, ricercatori e policymakers.

Dopo aver analizzato l'impatto che l'inflazione ha sul reddito disponibile delle persone, soprattutto di quelle più vulnerabili, e sulla loro libertà di scelta, si propone qui di includere un livello minimo di sussistenza all'interno dell'HDI, al di sotto il quale non è possibile pensare di considerare il reddito disponibile come qualcosa che contribuisca a soddisfare le proprie ambizioni, ma il minimo necessario per la sopravvivenza. Questa scelta è stata affrontata consapevoli che la discussione è aperta e tutt'altro che conclusa, ma anzi aperta a ricevere contributi e miglioramenti.

Per la definizione del costo di sussistenza sono stati considerati tre aspetti fondamentali per la sopravvivenza:

- **Cibo:** per questo aspetto necessario alla sopravvivenza si è considerato il costo di una dieta sufficiente dal punto di vista calorico come definita dall'OMS e calcolata dalla World Bank. Per questa categoria sono quindi state tralasciate le diete più equilibrate e salutari in quanto, per diversi motivi di inclinazione individuale, potrebbero non essere desiderabili.

- Riparo: per quanto riguarda il costo di riparo è stato utilizzato il costo dell'affitto e di riscaldamento come calcolato dalla Banca Mondiale. Ove questi dati non fossero disponibili è stato usato il costo medio regionale o, nel caso questo non fosse pertinente perché superiore al reddito medio pro-capite del paese, il rapporto tra il reddito ed il costo dell'affitto medio per la regione.
- Trasporto: visto l'impatto che questi costi hanno sulle persone più vulnerabili come le donne o le minoranze, che spesso sono costrette a vivere in luoghi più insicuri o remoti rispetto a quelli di produzione economica, è stato deciso di includere il costo pro capite per servizi pubblici di trasporto (meno importanti, ma più rilevanti del costo per mezzi privati).

Le conclusioni di questo studio in cui l'HDI viene pesato non più per il reddito pro-capite, ma per il reddito pro-capite disponibile dopo le spese necessarie per la mera sopravvivenza, sono una ulteriore polarizzazione tra paesi con un alto livello di Sviluppo umano e quelli che ne hanno uno basso. Questa polarizzazione potrebbe cogliere meglio le differenze nello standard di vita e di *'potenzialità'* di soddisfare le proprie ambizioni tra i vari paesi di quanto non faccia l'Indice *'classico'*.

L'altra interessante conclusione è che alcuni paesi guadagnano posizioni nel ranking ed altri le perdono. Questo risultato potrebbe essere usato per guidare alcune politiche di welfare e per aiutare a migliorare la posizione della loro popolazione.

In aggiunta si ritiene che le basi che hanno permesso di individuare le categorie di costo ed i livelli costituiscano fondamenta sufficientemente solide e scientifiche e non risultino paternalistiche.

È quindi importante concentrarsi sull'indice di qualità di vita (Y-Index) perché, se è vero che non è il reddito che permette di comprendere le preferenze individuali, esso può

permettere un individuo di ragionare in termini di costo-opportunità e di sapere qual è il valore della propria scelta alternativa al reddito stesso.

Lontano dall'essere un indice perfetto e nonostante alcune debolezze (molte delle quali coincidenti con quelle dell'HDI classico), questo indice corretto può aumentare il livello di accuratezza dell'Indice stesso senza aumentare il suo livello di complessità.

1. Abstract

Human Development Index (HDI), since its introduction in 1990, has been used to investigate the ‘*capabilities*’ as a way to understand the well-being of people as per Amartya Sen’s Approach (Stanton, 2007) emphasizing the importance of ends over means (Sen, 1985).

Through the essay, the history and the evolution of the HDI as well as its modification will be analyzed: UNDP, in fact, built this tool as “evolving and improving rather than as something cast in stone. It is also an exercise in which as many of its users as possible should actively participate.” (UNDP, 1993: 104).

A particular focus will be on the GDP per capita index, its modifications, critiques and ratio to understand whether it can now tackle the task it was aimed to or if further evolution might be required.

Moreover, a general and deeper analysis of other critiques and modification proposals to the index will be assessed.

Once state of the art on the topic is studied, it will be investigated the chance to weigh GDP per capita with the subsistence cost of living of every country. The reason behind this idea is to avoid critics to HDI such as redundancy and the fact that some scholars mocked HDI due to its incapability to draw attention away from GDP and towards a wider concept of human development (Stanton, 2007). Moreover, in a world where the poverty threshold in “developed countries” has been lowering, inequalities are rising and cyclical inflation phenomena are displaying effects, is GDP per capita still a good parameter to be considered per se?

To achieve such an ambitious goal, it will be important to decide which parameters to consider: ‘Food prices’ or just some more basic essential goods such as ‘Fruit and Vegetable prices’ leaving aside ‘Milk, cheese, eggs and Meat prices’; ‘Housing and utilities prices’ over ‘Furniture and household maintenance prices, similarly ‘Transport prices’ instead ‘Vehicle

price'. Other things that may influence the actual weight of per capita income and that shall be thought if included or not are: Cost of living, Bread and cereal, Fish and seafood, Clothing, Healthcare, Communication, Recreation and culture, and Education, ...

This is because considering in the index just the income not needed for subsistence it would mean considering just the income available for personal realization and aspirations.

2. Introduction

Human Development Index (here on HDI) was designed and developed to “*emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone*” UNDP (2020a, p. 235).

The Nobel price Amartya Sen's work on human capabilities, formulated in terms of whether people can "be" and "do" desirable things in life, forms the foundation of the human development concept, which was established by the economist Mahbub Ul Haq (Sen, 1985) (Ul Haq, 1995) (UNDP, 2020a). Furthermore, an influence also derives from the connection between development and economic growth in the 20th century (Sen, 1999). So, when Gross Domestic Product grew in importance till reached a dominant position among the several indicators of a country's “development” understood as progress and economic growth, no other tool had been developed to measure and “quantify” welfare and wellbeing of a country's people. In the second half of the 20th century, and mainly between the ‘70s and ‘80s, the discussion on the concept of development matured to the point of including different indicators and points of attention, including focusing on employment, redistribution of growth, and if people were capable of meeting their basic needs (UNDP, 2020a). This debate followed the contribution of the academic discussion highlighting how inequalities grew: just, for instance, the income interval between the fifth of the world's people living in the wealthiest countries and the fifth in the poorest amounted to 30 to 1 in 1960, skyrocketing from 60 to 1 in 1990 and up again to 74 to 1 in 1997 (Harvey, 2007) (Edsall, 1985).

These ideas settled little by little and tracked the route to identifying the “Human Development” framework and computation (UNDP, 2020a). Since then, it has been possible to appreciate how the acceptance of non-solely-economic indicators kept gaining appraisal as adequate development proxies. Therefore, since the definition of its first Human Development Report, UNDP first designed HDI “as a measure of achievement in the basic dimensions of human development across countries” (UNDP, 2020a).

Keeping faith in its original purpose, UNDP created the HDI as “evolving and improving rather than something cast in stone. It is also an exercise in which as many of its users as possible should actively participate” (UNDP, 1993), and from a ‘*crude*’ measure of human development remains a simple unweighted average of a nation’s longevity, education, and the income it evolved into a broadly accepted (besides many critiques that led and kept leading to modifications and improvements) tool to measure development.

The approach of the Human Development Index focuses mainly on freedom and specifically on freedom of choice: as UNDP states, it is pretty different from being hungry for a period due to a religious preference or being hungry because you cannot afford to purchase food (UNDP, 2020a).

In detail, the approach theorized by Amartya Sen that paved the way for understanding the concept of Human Development and well-being is the separation between utility, functioning, and possession (or purchasing power): one person can, within some constraints given his unique features and his command over commodities, choose a set of utilization functioning (synthesized by the vector: $b_i = f_i(c(x_i))$; every one of which $(Q_i(X_i))$ lead to relative happiness ($u_i = h_i(J_i(c(x_i)))$). Thus, one economist cannot take for granted that the personal choice will aim at maximizing his well-being in terms of what is possibly achievable (highest value of V_i for valuation function: $V_i = [v_i | v_i = v_i(b_i), \text{ for some } b_i \text{ in } Q_i]$) as other’s happiness might be more valuable for an economic actor and so to identify the most valuable elements for

individuals (Sen, 1985); moreover, ‘living longer, or being free from malaria, or not being - ashamed to appear in public-’ (Smith, 1776) cannot be seen as commodities (unless until a certain point) and therefore the need for a new way of formalizing them was starting to compel.

So, suppose it is accepted that there is a difference between *utility*, *desire*, and *happiness*. In that case, the classical economic person’s choice function based on a binary relation (utility f) is no longer valuable to tackle the whole complexity of one’s maximization of well-being (Sen, 1985) (Herzberger, 1973).

2.1 Framework and ex-ante paper argument

Given what was just described above, the current paper will focus on whether the tools and components of HDI are suitable for the scope. In particular, is the GNP index good for tackling people's freedom of choice?

The approach, contrary to Sen’s direction, will focus on the utility f and, therefore, on maximizing the possible return from income. Still, it will focus on the concept of cost-opportunity: a person that maximizes their utility by giving up income can do so but being conscious that the time utilized in any way maximizing their well-being also has an economic value. A person is indeed genuinely free to choose only if they know to understand the alternatives, not only the chance to choose between them, for instance, in a situation of information asymmetry with their employer (information asymmetry which is also a case of market failure (Krugman & Obstfeld, 2009)). So, this work will attempt to consider only the income share remaining from the subsistence expenditures (which will be studied and defined during the paper), namely the cost of purchasing the minimum healthy calories needed to nourish, the price of a decent shelter (housing) and the transport cost to go to work.

For instance, during the Great Depression (generally indicated as the 1929 Depression), the median annual pay was about 22 % of the cost of a home. In 2019, it was only 14 percent of that cost (housing). By way of explanation, it was easier for the average citizen to purchase

a house during the Great Depression than it is nowadays, based on their pay relative to the cost of the average home¹. So, did the fact that per capita income has increased in the last decades increase the freedom of choice of the American people, or has it been neutral? Or rather, is this freedom decreased since the outcome the per capita GNP can provide is diminished?

Therefore, the paper will investigate these aspects and attempt to indicate a logical framework for a more suitable approach to reduce the risk of misinterpretation of reality.

The current work, however, will not go into a deep analysis of possible differentiation of increasing well-being of, for instance, women and minorities (analysis which might be very interesting and in general useful) as this is not the purpose of the ‘*corrected*’ HDI which objective is to give a synthetic number to rank and share an immediate idea of the well-being of a country general population. For this, please look at Campo’s (UNDP, 2021) “Global Multidimensional Poverty Index (MPI), Unmasking disparities by ethnicity, caste, and gender”.

¹ In 2019, in the USA, the median annual earning for women was \$47,299. For men, it was \$57,546. Averaged together, that’s about \$52,423, U.S. Department of Labor. (2022). *Median annual earnings by sex, race and Hispanic ethnicity*. Retrieved July from <https://www.dol.gov/agencies/wb/data/earnings/median-annual-sex-race-hispanic-ethnicity>; the cost of the average home at the same time was \$377,700 FedPrimerate. Retrieved July from http://www.fedprimerate.com/new_home_sales_price_history.htm, which means about 14 percent of the median salary

3. A brief History of the Human Development Index

The human Development Index was for the first time presented publicly by the United Nations Development Program (UNDP) within the first annual *Human Development Report* (HDR). This publication was disruptive as it “transformed the landscape of development theory, measurement, and policy” (Stanton, 2007, p. 3).

By providing country-level data on what had been designed to be (according to Sen’s approach described above) well-being indicators, the report deployed a first attempt to quantify ‘*human development*’.

The wideness of the disruptive conceptualization of human development is well described by Stanton when she affirms that:

“UNDP’s establishment of the HDR expanded both the availability of measurement and comparison tools used by governments, NGOs, and researchers and our common understanding of development itself” (Stanton, 2007).

So, this experience made clear that HDR and HDI led to this “revolution,” as demonstrated by the general acceptance of the Sustainable Development Goals by virtually all countries and governments and by the attention given to them by the general public in a civic monitoring attitude.

Of course, the quantification of Human Development has evolved not only by the improvement of HDI (which will be analyzed later on) but also by the complementary composite indices on gender gaps, inequality, poverty, planetary pressures, and thematic dashboards on the quality of human development, life-course gender gap, women’s empowerment, environmental and socioeconomic sustainability and so on (UNDP, 2022).

The core of Human Development Reports for 30 years, in the latest 2020 edition, includes the HDI rankings for 189 countries plus an attempt for six more. Moreover, the latest report shows an updated “Planetary pressures-adjusted Human Development Index” (which

will be shortly discussed later). In traditional HDI, life expectancy, literacy, enrollment in schools, and income component indices are integrated into a single index that can be used to compare the degree of human well-being between nations or to track one country's development through time. It aims to feed alternatives to the still mainly used index to evaluate a country's advancements and progresses in its development on GDP and per capita national income (Stanton, 2007) (UNDP, 1990) (Krugman & Obstfeld, 2009).

To make some examples of how the index evolved up to today HDR & Anthropocene, we will take into consideration the first three reports (ul Haq, 1992) (UNDP, 1990):

- The 1990 report illustrated that what matters is how income level (GDP per capita) has the chance to produce positive externalities in people's lives. Some countries, such as *exempli gratia* Costa Rica, have much lower per capita income than others, e.g., Oman, in this case about one-third, at the time. Despite this, the first's literacy rate is three times higher. Similarly, its life expectancy is about ten years longer, and Costa Rican population can enjoy a wide range of economic, social, and political liberties.
- The 1991 Human Development Report took a more systematic approach in investigating country policies and breaking down their public expenditures concerning basic population needs: it advanced the thesis that the vast majority of the developing countries might have been able to pursue and finance their essential human development objectives if they had enough political wiliness to decrease military expenditures, privatize inefficient and non-returning State-owned companies and enterprises. Then it became a little more political by claiming that other interventions might be necessary to correct developing countries' distorted development priorities and improve their national governance. Within this HDR, 50 billion USD had been calculated as the money

that could be saved to fund human development ambitions if developing countries could rationalize their budget priorities.

- The 1992 Report advances the dialogue further by focusing its argument on the fact that the whole global system must also be included in the search for fair access to market possibilities.
- ...
- In 2020, for the 30th anniversary of the first publication, HDR pushed up to the “next frontier”: Human development and the Anthropocene. It focuses on the pressures people put on planet Earth and that lead to, for instance, a rise in zoonotic pathogens² and of course other threats such as “*Climate change, rupturing inequalities, record numbers of people forced from their homes by conflict and crisis—these are the results of societies that value what they measure instead of measuring what they value*” (UNDP, 2020b). The report, therefore, embraces the thesis of many scientists that the pressures on human activities on the planet have become so great that the Earth has entered an entirely new geological epoch: the Anthropocene or the age of humans.

On the other hand, the thesis behind this work is that it is not only essential but instead mandatory to investigate the environmental impact of human actions, climate change, and environmental sustainability, but since the resources aren't unlimited and given the human aspiration for a better condition, it is still important to push for a more equitable redistribution of those resources even at a cost for the “developed” countries. Therefore, it is not a waste of energy to focus on the traditional Human Development Index, its implications, and possible corrections that may incentivize the government to better target development policies. This

² The arrival of new pathogens is a fear that scientists for years had shared. For this reason, the recent pandemic shall not be seen as an isolated and unrepeatable phenomenon.

revised Human Development Index may be used and integrated to form a new “Planetary pressures-adjusted Human Development Index”.

In fact, up to the ‘90s, thanks to the Human Development Report that for the first time, studied the income level of people, not just nations, in a global setting and concluded that the income disparity between the wealthiest one billion and the poorest one billion people has doubled since the ‘60s and reached a dangerously high level of 150 times. Those first reports highlighted how the income disparity within nations between the wealthiest 20% and the poorest 20% of the national population was way smaller: i.e., five times in Sweden, six times in Germany, nine times in the USA, and 26 times in Brazil. So, a question shall have arisen: how had things that might be politically and socially unacceptable within nations been quietly tolerated at the global level (ul Haq, 1992; UNDP, 1990)?

Unfortunately, the situation at a global level did not improve. In fact, as per the latest Oxfam report on global wealth, *Time to Care* (Oxfam, 2020): the 22 wealthiest men in the world have more wealth than all the women in Africa; women and girls put in 12.5 billion hours of unpaid care work every day, with a contribution to the global economy of at least \$10.8 trillion a year, more than three times the size of the worldwide tech industry; getting the wealthiest one percent to pay just 0.5 percent extra tax on their wealth over the next ten years would equal the investment needed to create 117 million jobs in sectors such as elderly and childcare, education and health (Oxfam, 2020).

And suppose it is true that global reforms can never substitute national reforms. In that case, it is also true that in a situation in which the tertiary enrolment rate in the South is only one-fifth of the North, research and development expenditure is only 4%. Scientific and technical personnel are only one-ninth (ul Haq, 1992), and getting worse, it is impossible to foresee a remarkable improvement without a global approach to wealth redistribution.

Moreover, research has demonstrated that, in the long term, it is in the interest of rich countries to pursue global sustainable growth.

3.1 The concept of “Utility”

As anticipated in the Introduction, we will now analyze in detail the history of the concept of utility, and we will try to understand how it became a diriment in the idea of Human Development.

In the dominant economic view, utility maximizes return, the measure of individual happiness or satisfaction. An asset is, therefore, valuable if considered suitable to satisfy demand. Moreover, according to utilitarianism, the maximization of social utility should be the ultimate goal of society, which should therefore seek to obtain "the greatest happiness for the greatest number of individuals".

For the sake of the research and the chapter, we will see below some details of the evolution of the theories and ‘philosophy’ that culminated in Sen’s theory of capabilities approach to human welfare.

The basis of the modern economic framework roots back in Greek philosophies, and in particular in Aristotle, who (some thousand years and miles away from Amartya Sen) reckoned well-being as an achievement deriving from our actions instead of our belongings (Kraut, 2015; Ransome, 2010; Stanton, 2007). Then, over time the meaning of well-being faced many modifications from Aristotle’s view: to the medieval aspiration for heavenly reward and fear for punishment as a reference of material well-being; this view slowly shifted to the predetermination of the Protestant and specifically Calvinist belief; the superior decision-maker intervention for population wellbeing had remained the main logical framework until the scientific aestheticism of the Renaissance broke in and lasted until the first lights of the Utilitarian philosophy started to spread during the 18th century (Segal, 1991; Stanton, 2007). Sen, though, firmly criticized the Utilitarian view as their theorists emphasized the significance

of having a single indicator of human well-being rather than several unrelated and incomparable components. Sen advocates for a multidimensional dimension of well-being (Sen et al., 1987).

In classical economics, for authors such as Smith and Ricardo, the utility was a simple prerequisite for the exchange value of a good: only a commodity that satisfies specific needs or is desired by someone (i.e., valuable) can have a positive exchange value, but the latter must be determined based on elements other than the value in use. An asset's exchange value depends on the measurable and quantitatively comparable production costs, not by utility (Hunt, 1989; Treccani, 2022).

With the marginalist approach (following the so-called “marginal revolution”), starting from the first half of the nineteenth century, there was a change of perspective, and the objective theory of value of the classical approach was contrasted with a subjective conception, according to which the value of goods arises from the comparison between scarcity of resources and utility attributed to goods by individuals (possible by the distinction between total utility and marginal utility) (Hunt, 1989; Treccani, 2022).

With Pareto reformulation (1906), the marginalist theory was overtaken by adopting an ordinal conception of utility instead of the cardinal one. Pareto, using the indifference curve technique (developed by F.Y. Edgeworth), was able to establish, for each pair of assets, if the utility resulting from the possession of one of the two assets is less than, equal to, or greater than the utility resulting from the control of the other asset. In this way, it was possible to establish an ordering of the preferences of each individual concerning a basket of goods based on an ordered scale rather than on the measurability of utility. Moreover, denying the possibility of intersubjective comparisons of utility gave rise to a new interpretation of the analysis of social well-being (Hunt, 1989; Treccani, 2022). This happened during the so-called Ordinalist revolution.

In neo-classical economics, however, the word utility means an individual's level of satisfaction (mental), provided that levels of utility or satisfaction cannot be compared between individuals. It is easy to see how this concept is both broad and slender simultaneously: despite the decreasing utility concept, virtually everything is therefore having and giving utility. So, even though it encompasses, as said, almost any good, it cannot be aggregated given the absence of interpersonal comparability. Therefore, it is useless for the definition of personal well-being and social welfare and cannot be compared to consider distribution (Stanton, 2007).

Despite this theory's limited usefulness, it remained dominant until the '30s of the twentieth century. With the evolution of economic theory, though, the need for quantifying people's utility became more compelling. This need then led to national income per capita at first, then Gross National Product per capita generally accept and broadly use as the measurement for population well-being.

Luckily, more recent researchers and theorists revolutionized our view unchaining neo-classical constraints and broadening the concept of well-being and welfare, and untying it from the idea of utility (as described above). We are therefore entering the so-called '*Humanist Revolution*'.

Of course, the history of the above-described processes is much more complex and structured, and many more theorists have contributed to it. Although analyzing in detail the whole historical journey of thought is not the aim of this paper, for more information, please refer to the history of HDI provided by Stanton (2007).

3.2 How well-being and social welfare had been measured in history

Several approaches have been developed throughout history and across the world. For instance, from the end of World War Two, the focus shifted from development 'per se' to the subject of development (Dreze & Sen, 1999). Unfortunately, this emerged as a neglected branch of the growth economic. Still, in one matter, it remained stacked to the orthodox growth

economic theory: “an overarching preoccupation with the growth of real income per head” (Dreze & Sen, 1999). This is because of the classical view of Adam Smith and John S. Mill, which is income (wealth) that allows one to pursue the life a person would value living.

While in Sen’s view, “Poverty is, thus, ultimately a matter of `capability deprivation, and a note has to be taken of that basic connection not just at the conceptual level, but also in economic investigations and social or political analyses” (Dreze & Sen, 1999).

Oscar Arias Sánchez, former president of Costa Rica and President of the Arias Foundation for Peace and Human Progress, criticized himself while praising ul Haq, the use of per capita income, and this gives the idea of how this approach is now broadly accepted among the international and scientific community (Sánchez, 2000).

This paper, though, despite totally embracing Sen’s approach and theories, considers that income per capita still has a role in determining well-being and poverty as it shall be considered in terms of cost-opportunity. It means that, leaving aside the subsistence costs that everyone shall be able to face for survival (the income needed to purchase minimum calories required for a healthy life and a roof over the head) the remaining share of income can be substituted by every ‘economic actor’ with the non-monetary goods they prefer for ethical, religious or personal preferences. In fact, for this to be considered a free and aware choice, the ‘actor’ shall be conscious of the economic alternative of that preference, and therefore, when attempting to assess a country’s situation, it is reckoned by the author of this paper, the per capita income remaining from the subsistence expenditures might be a good approximation as would consider only the income that might effectively be freely spent not for mere survival.

The definition of GDP, GNP, and their per capita amount will be detailed in the following chapters. For now, it might be sufficient to highlight some critiques and weak spots they reveal when it comes to measuring people's well-being, basically, but not only because of national accounts (sources for the design of those indicators):

- consider only monetary exchanges;
- account in the same way goods with commodities causing negative externalities such as, for instance, nuclear weapons, which production has a propensity to lower social welfare;
- consider the same way addictions and cures, road accidents and prevention and the cost of reducing negative externalities such as oil spills;
- do not consider the scarcity of resources;
- does not esteem leisure time;
- does not consider freedom and human rights; and
- does not consider at all the ‘*Trilussa paradox*’³ (or, more rigorously the distribution of wealth within the national community) (Cobb & Daly, 1989; Hicks & Streeten, 1979; Kuznets, 1955; Morris, 1979; Nordhaus & Tobin, 1973; Ram, 1982; Sen, 2000a; Slottje, 1991; Stanton, 2007; Ul Haq, 1995; UNDP, 1990).

So, it appears that a conceptual conflict is emerging, if not a trade-off at all, between the notions of ‘*Growth*’ and ‘*Development*’ if we do not take for granted anymore the neo-classical and neoliberal assumption of “*trickle-down*” redistributive effects of growth, an assumption that revealed itself as sensationally wrong (Harvey, 2007; Hicks & Streeten, 1979; Oxfam, 2020; Stanton, 2007).

³ Sai ched'è la statistica? È na' cosa / che serve pe fà un conto in generale / de la gente che nasce, che sta male, / che more, che va in carcere e che spósa. / Ma pè me la statistica curiosa / è dove c'entra la percentuale, / pè via che, lì, la media è sempre eguale / puro co' la persona bisognosa. / Me spiego: da li conti che se fanno / seconno le statistiche d'adesso / risurta che te tocca un pollo all'anno: / e, se nun entra nelle spese tue, / t'entra ne la statistica lo stesso / perch'è c'è un antro che ne magna due. / Er compagno compagno: / Io che conosco bene l'idee tue / so' certo che quer pollo che te magni, / se vengo giù, sarà diviso in due: / mezzo a te, mezzo a me... Semo compagni. / No, no - rispose er Gatto senza core - / io non divido gnente co' nessuno: / fo er socialista quanno sto a diggiuno, / ma quanno magno so' conservatore. (In this poetry it is stated how in general accounting, if a person eats a whole chicken while another one does not eat anything at all, the results will look like we had half a chicken each).

It is in fact demonstrated that it is possible to face high economic growth breeding inequality. Moreover, growth is often unaccompanied by redistributive mechanisms put in place by governments (Chenery et al., 1974; Harvey, 2007; Hicks & Streeten, 1979). Other studies, on the other hand, reckon that some trickle-down effect is anyhow happening in case of economic growth, although indirectly: as widening the *plateau* for tax revenues may lead to an increase of expenditure for welfare and social services expenditures. Therefore, growth is still a desirable objective (Dreze & Sen, 1989). Still, Drèze & Sen (1989: 188) under the name of “unaimed opulence” identify those negative externalities of economic growth unaccompanied by equity or redistributive policies to correct distortions: widespread poverty, illiteracy, ill health, child labor, crime, and starvation (Dreze & Sen, 1999) as there is no positive correlation between GDP (also per capita) and well-being.

So, this is the great contribution that HDI and HDR gave to the concept of development by changing the mindset with regards to the broadening of the spectrum of things to be considered and also the so-called “*intangibles*” preferences of human beings that determine their welfare. If there is agreement on this point, also some criticisms that emerged against HDR remain hollowed: if it is true that even in the past GDP was not considered the only measure of well-being and that even before there was a more comprehensive view of it (Rao, 1991; Srinivasan, 1994), it is also true that national income as a measure of well-being exerted an overwhelmingly dominance (Stanton, 2007). Moreover, despite it could be tolerable in developed countries with high Gini Index as Hicks & Streeten state: “*despite the many problems with national accounting in developing countries, the national accounts have continued to be the main focus of discussions of growth, the allocations between investment, consumption and saving, and the relative influence of various sectors in total value added. GNP per head is widely accepted as the best single indicator of development, both historically and for international comparisons*” (Hicks & Streeten, 1979).

3.3 HDI before HDI

Several attempts have been carried out to tackle alternative dimensions of Human Development beyond GNP and GDP: by adjusting GNP, integrating it with other composite indexes, and by social indicators. But some problems emerged from the absence of objective standards for an acceptable approach to integrating the selected indicators, as well as for the components that should and should not be included (Stanton, 2007) to the fact that the attempts aimed at the impossible objective to express in money value or some other broadly accepted common denominator every aspect of social development (Hicks & Streeten, 1979; D. V. McGranahan, 1972).

Some of the earliest and most important attempts were carried out by the United Nations as well, specifically United Nations Research Institute for Social Development (UNRISD):

- 1966: “*Level of Living Index*”: this report analyses categories for physical needs (**nutrition**, **shelter**, and health); cultural demands (education, leisure, and security); and higher needs (measured as **income above a threshold**) (Drewnowski & Scott, 1966);
- 1972 “*Development Index*”: including nine economic and nine social characteristics (Hicks & Streeten, 1979; D. McGranahan, 1972; McGranahan, 1985; Stanton, 2007);
- 1973 “*Predicted GNP Per Capita Index*”: developed by Organization for Economic Cooperation and Development (OECD), it studied 82 countries that were ongoing a development path and analyzed six social variables (Hicks & Streeten, 1979; Stanton, 2007);
- 1975-1977 “*set of social indicators*”: attempts carried out by several agencies, including the UN, OECD, AID, UNESCO. Worth mentioning, that in 1975, United Nations Economic and Social Council ranked 140 countries after the

sum of the singular rank for each of seven socio-economic indicators: and five economic ones (energy, the manufacturing share of GDP, the manufacturing share of exports, employment outside of agriculture, and number of telephones) and two socials (literacy and life expectancy) (Hicks & Streeten, 1979; Stanton, 2007);

- 1976 “*Basic Needs Approach*”: this approach was based on considering a sufficient level of consumption and essential services such as health care and primary education. A comprehensive set of indicators had been considered from time to time according to specific approaches. Some attempts, though, had been made to decrease the number of variables to be considered to include the ones with the greatest extent of interdependence between them; the most remarkable were carried out by Paul Streeten and by Frances Stewart (Stanton, 2007; Stewart, 1985; Streeten, 1981). A significant convergence of those studies emerged that life expectancy could stand as a proxy for all basic needs.
- 1979 “*Physical Quality of Life Index (PQLI)*”: designed by Morris David Morris, who was working for the Overseas Development Council. Its objective was to define an objective measurement of whether a minimum set of basic human needs was being covered by the world’s poorest people (Stanton, 2007). PQL Index combined health indicators such as infant mortality, life expectancy at one year, and primary education data as literacy. It then transformed the indicators considered into an Index themselves by comparing the level to a fixed range of possible levels and then taking the average of the three components (it can be seen that UNDP had embraced this approach in designing HDI): “*The extremes that define each index affect the placing of countries on that particular index as well as on the composite index*” (Morris, 1979, p. 49). Another

extremely innovative approach of this index is that it also analyzed, where available and reliable data were collected, sub-national measures by gender and region (Stanton, 2007).

The list above is intended by no means to be exhaustive. Many other attempts had been made to tackle the dimension of social well-being, i.e., Camp and Speidel's (1987) International Human Suffering Index, which combined ten measures including income, infant mortality, nutrition, adult literacy, and personal freedom (Srinivasan, 1994; Stanton, 2007)). Moreover, none of them were free from critiques and debate as, of course, building an index is both a political and arbitrary decision; for instance, Slottje studied 130 countries and drew on the capabilities approach by constructing a composite of 20 indicators, arguing that Morris' three components were insufficient to capture the quality of life (Slottje, 1991; Stanton, 2007). Although this approach appears sensitive, it is also true that the highest is the desired level of accuracy, and the hardest is the evaluation of a phenomenon (Delvecchio, 1995).

4. Human Development Index, concept and measurement

Ul Haq (1995) targets, in a few words, an essential concept that is too often forgotten in economic approaches and theories as used to talking in models, aggregated abstractions, and numbers: “*after many decades of development, we are rediscovering the obvious—that people are both the means and the end of economic development*” (Ul Haq, 1995). Moreover, ul Haq analyzed how many developing countries (e.g., Kuwait) converted their temporary gains into permanent income by sacrificing their financial capital to invest in human capital.

So, as described above in previous chapters, we have finally realized that GDP and GNP can increase while human well-being shrinks (Harvey, 2007; Stanton, 2007; Ul Haq, 1995).

So, UNDP appointed ul Haq in charge of the ‘*Human Development*’ project, and he redefined the concept of well-being, kneading on the capabilities approach to human prosperity. The challenge then did not stop there but was to quantify that brand-new well-being formulation. The first results of the work can be appreciated in the first Human Development Report, where it was stated that “*means of development have obscured its ends because of two primary factors*” (Stanton, 2007): 1) national income figures do not reveal the actual composition of that income or how it is distributed (namely who the beneficiaries are); 2) what it is valuable for people might not be mirrored in higher GNP or income or growth indicators (Sen, 1985, 2000a; Stanton, 2007; ul Haq, 1992; UNDP, 1990 through 2022): “*better nutrition and health services, greater access to knowledge, more secure livelihoods, better working conditions, security against crime and physical violence, satisfying leisure hours, and a sense of participating in the economic, cultural and political activities of their communities*” (UNDP, 1990, p. 9).

In the same Report, just after the above-quoted sentence, it is admitted that one of the options people may want is a higher income, but that it is not the total of human life. This paper

approach, though, is slightly different, as described before: the income (or better, its part beyond the subsistence threshold) is not to be considered per se but in terms of cost opportunity. In fact, a person shall be aware of the economic value of their time but shall be left free to choose any substitute of it they prefer.

So, the three pillars of human development focus on the concept of maximizing people's choices.

Despite this, a little debate occurred during the first design of the first HDR (where the first HDI was presented) between Amartya Sen, one of the leading consultants, and the principal drafter ul Haq: the first considered useless a raw, unrefined index like the Human Development one as he reckoned human development as an “*illuminating concept*” that shall cover the whole spectrum of well-being and freedom within people's lives. The second replied that it was useful precisely for that reason: it could be appealing enough to the public and the policymakers because it had the same “*level of vulgarity*” as GNP as it reduces to a single figure, but that it takes into consideration social aspects as GNP does not (Sen, 2000a; Stanton, 2007; Ul Haq, 1995). Later, both ul Haq and Sen recognized that HDR helped answer the growing request from economic actors for the variegated quantification of development and well-being (Stanton, 2007).

4.1 H-Index – Life Expectancy Index

Life expectancy, despite the intrinsic value it carries along “*is thus a proxy measure for several other important variables in human development*” (UNDP, 1990, p. 11).

Three are the primary considerations that led the drafter of HDI to utilize life expectancy as one of the three pillars of the index:

- The intrinsic value of longevity;
- It might help people to hunt different and variegated goals;

- It can be associated with other aspects of a positive life: such as good health and nutrition (UNDP, 1990, p. 11).

UNDP recognizes that for countries with high longevity levels, there might be two orders of problems: it is easy to underestimate the value of longevity and the challenge of guaranteeing the well-being of the senile and infirm population (UNDP, 1990).

On the other hand, the value of longer life expectancy increases for countries with lower life expectancy due to several causes such as distress, malnourishment, deprivation, and lousy health services from delivery assistance. (UNDP, 1990).

The normalization formula synthesizing the H-index is the following:

$$H - Index_i = \frac{LE_i - 20years}{85years - 20years}$$

The reason behind this formulation follows the logic of:

- Attainment: “*what has been achieved, with greater achievement meaning better progress*” (UNDP, 1990, p. 13);
- Shortfall: the continuing shortfall from the desired value or target; or, in economic terms, the diminishing marginal return of an improvement (we will describe in detail this topic in the Y-Index section).

To understand the approach, it is easier to reason in terms of performance. The best way to compare them is in percentage change: the 10-year rise in life expectancy from 60 years to 70 years takes to a 17% increase; however, a 10-year surge in life expectancy from 40 years to 50 years is a 25% increase.

From 1990 onward, the index has been changed to better tackle the quality of “*the capability to live a long and healthy life; this capability might be better captured by healthy life expectancy, an indicator that looks at both the length of life and the quality of health during life. It adjusts life expectancy to account for illness or disability*” (UNDP, 2020a). This adjustment lowers HDI values for all countries, displaying a high correlation rate of 0.997.

So, for our sake, the differences are minimal, and we will keep using the formula above for calculation purposes.

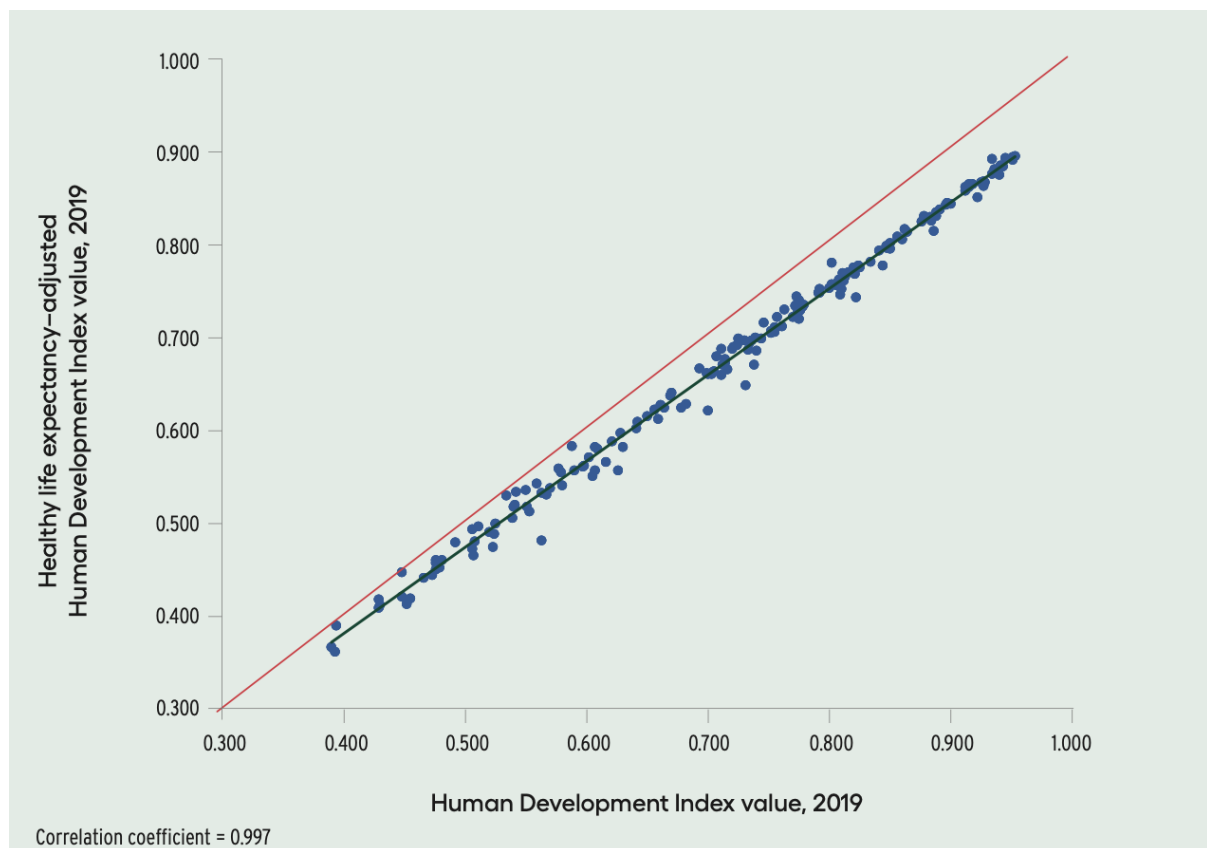


Figure 1 - Health-adjusted longevity vs H-Index_i (UNDP, 2020a)

4.2 E-Index – Education Index

E-Index_i is a synthetic index averaging the expected years of schooling and the schooling of elderly people to tackle both the actual and the foreseen picture of the educational system of a country:

$$LIT - Index_i = \frac{\left(\frac{MYoS_i}{15}\right) + \left(\frac{IfEYoS > 18; then 18; if not EYoS}{18}\right)}{2}$$

Where $MYoS_i$ means years of “schooling for ages 25 and above (years)” and $EYoS$ means “expected years of schooling (years)”.

Namely:

$$MYoS_i = \frac{MYoS - 0}{15 - 0}$$

And:

$$EYoS_i = \frac{EYoS - 0}{18 - 0}$$

This index does not reflect, however, the quality of schooling, but it is a crude representation of:

- Expected years of schooling: Number of years of education that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child’s life; and
- Mean years of schooling: Average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each group (UNDP, 2020a, p. 2020_Statistical_Annex_Table_2021).

Literacy figures are essential in measuring human development as fundamental steps in knowledge-building and emancipation (UNDP, 1990).

The arithmetic mean of the two education indices permits a principle of HDI, namely, the “*perfect substitutability*” between them (some critiques have emerged to this principle, e.g., Palazzi & Lauri, 1998; they will be analyzed in the following chapter). This approach seems reasonable in this regard as some developing countries can boast low scholar fruition among

adults but are longing and working hard to succeed in guaranteeing universal primary and secondary school enrolment to the youth population (Führer, 1996; UNDP, 2020a).

Up to the beginning of the '00s, this index had been slightly different: a synthetic index weightily averaging two separate indexes: education by literacy (LIT-Index) and school enrollment (ENR-Index): $E - Index_i = 2/3(LIT - Index_i) + 1/3(ENR - Index_i)$; where: $LIT - Index_i = (LIT_i - 0\%)/(100\% - 0\%)$ and.

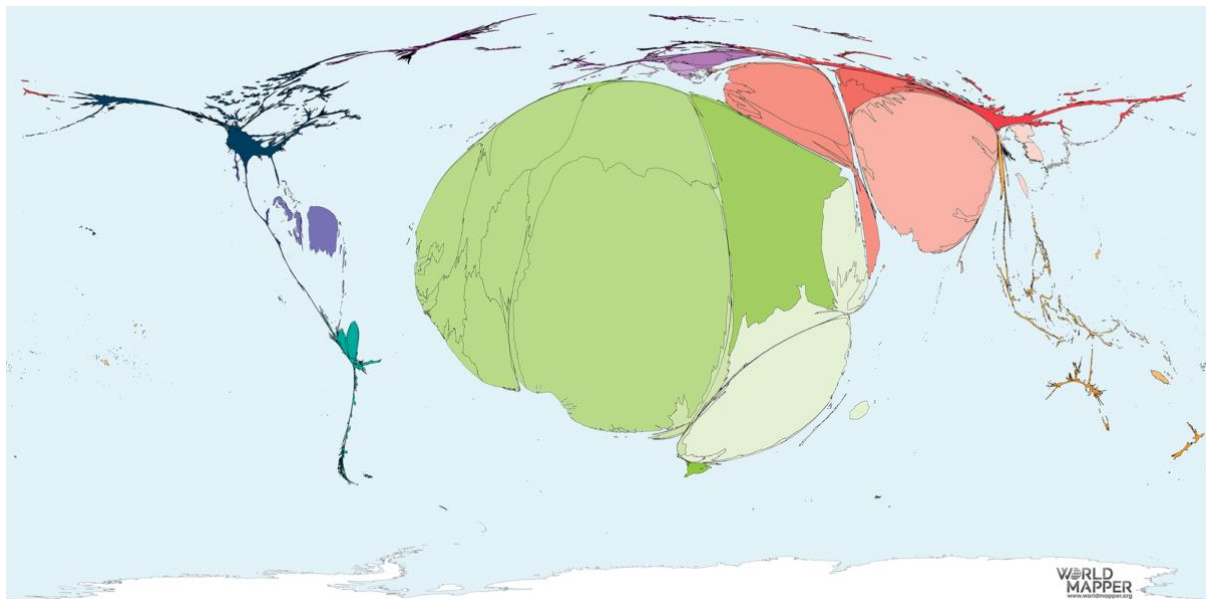


Figure 2 - No Primary Education, WorldMapper. Territory size is proportional to the primary school-age population (age 5 to 10) not attending primary education in the period 2010-2015. Data source: 2016 United Nations Human Development.

4.3 Y-Index – Standard of Living by GDP per Capita Index

The per capita GDPs used in the standard of living or income index are expressed in U.S.Ds. and already reduced to purchasing power parity (PPP) to eliminate differences in national price levels and make comparable time series. Moreover, income is capped at \$75,000, and natural logarithms are calculated for the actual, minimum, and maximum values to account for the diminishing marginal utility of income, as explained before. As stated in UNDP technical-notes-calculating-human-development-indices (UNDP, 2020a): “*Because each dimension index is a proxy for capabilities in the corresponding dimension, the transformation function from income to capabilities is likely to be concave (Sudhir Anand & Amartya Sen,*

2000) — that is, each additional dollar of income has a smaller effect on expanding capabilities. Thus, for income, the natural logarithm of the actual, minimum, and maximum values is used”. Also, with regards to the income index, the implication of such an approach can be summarized as follows: increasing GDP per capita by \$50 in a country where GDP per capita equals USD 250 displays a much more significant impact on the standard of living as measured in HDI than the same \$50 increase in a country where the average income is USD 2,500 or, even more, where it is USD 25,000 (Stanton, 2007; UNDP, 1990 through 2022).

So, the equation appears (similarly to before) as follows:

$$Y - Index_i = \frac{\ln(Y_i) - \ln(\$100)}{\ln(\$75,000) - \ln(\$100)}$$

The capped level changed a few times in the past, for instance, from 1990 to 1999, reaching 40,000 USD.

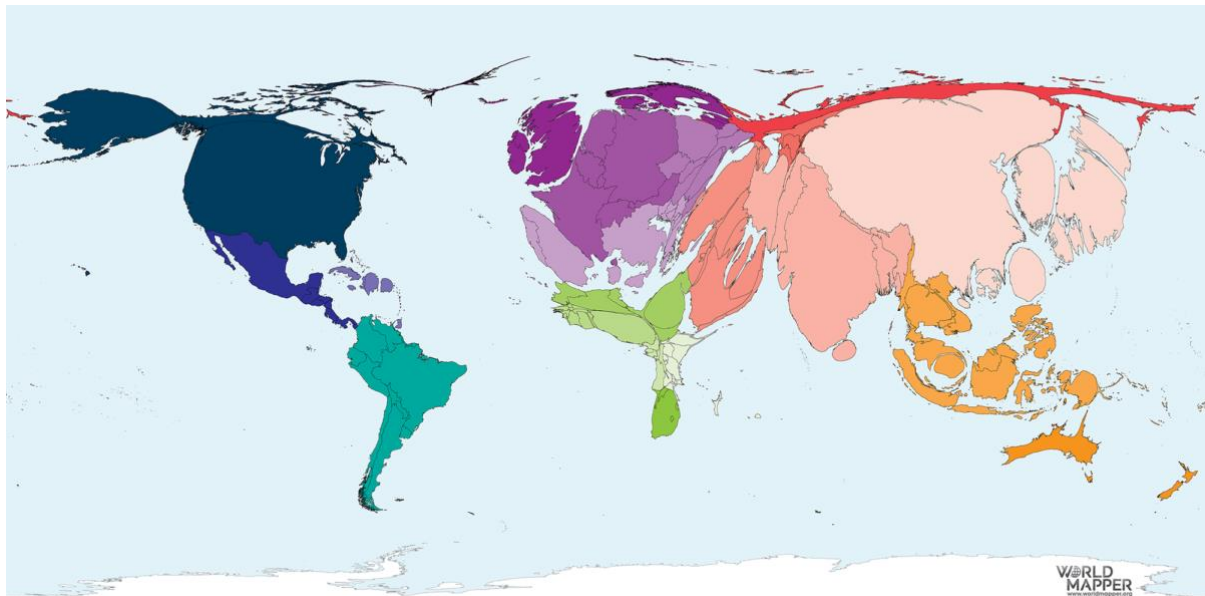


Figure 3 - GDP Wealth 2018. Worldmapper. his map shows the proportion of worldwide Gross Domestic Product in Purchasing Power Parity (PPP) based on exchange rates with the US\$, that is found there. Datafile

4.4 Aggregating the dimensional indices

The final step to calculate the HDI is to aggregate the three indices detailed before. As the HDI is the geometric mean of the three-dimensional index, the operation is pretty straightforward:

$$HDI = (IHealth \cdot IEducation \cdot IIncome)^{1/3}$$

Or:

$$HDI_i = \frac{H - Index_i + E - Index_i + Y - Index_i}{3}$$

Once again, the approach is one of using the arithmetic average to incorporate the perfect substitutability between them.

4.5 Weighting HDI, neutrality, or political choice

As previously described, building an index is both a political and arbitrary decision. Moreover, in the case of excessively complex weighting criteria, the index may risk appearing too hazy and give rise to excessive debate.

Nevertheless, some modifications in weighting have been proposed, although with different approaches: by standardizing (three) vectors in a multidimensional vector space to consider the principal variations from the mean (Noorbakhsh, 1998b); or by weighting differently the components of the HDI (Palazzi & Lauri, 1998).

Both approaches, though, start (explicitly or not) by questioning the substitutability principle, which, as we have seen before, might sometimes be questionable, but allows simplification and considers intergenerational progress in human development without prioritizing, top-down, which area of life better encompasses human capability.

For Palazzi and Lauri (1998), “*from the theoretical standpoint, the solution depends on introducing a concept of balanced and sustainable human development in which the three aspects are not only indispensable but also reciprocally self-reinforcing*”. So, their purpose is (similarly to before) a three-vector space in which it appears clear the disparities and imbalances between the aspects.

Undoubtedly, the approach to thinking about weighting is interesting as also within HDR, it was written: “[i]n an ideal world, the ‘meta production function’ of human

development would be specified, and the contribution of each variable to human development would be its weight” (UNDP, 1993, p. 109).

Palazzi and Lauri (1998) purpose is to empirically assess whether a stable relationship exists over space and time between the components described just above. Leaving aside the mathematical and methodological approach followed by them, the main problem is that changing the weight of HDI according to some specific criteria does not affect all countries in the same way, and the mechanisms to include all of them is way too arbitrary than using the formula: $HDI = \sqrt[3]{H - Index_i \cdot E - Index_i \cdot Y - Index_i}$.

Some scholars have focused on a higher weight to be given to health for a satisfactory life compared to other components of the HDI, as it would imply a better life quality (Jha et al., 2017). Others did the opposite, focusing on the relative weight of income as compared to life expectancy and education as income might be the one that allows the most freedom of choice among human development dimensions between the components of the Index (Atkinson et al., 1997; Kelley, 1991); other again suggest to put in place different weights giving priority time to time to social welfare function, a priori assumptions, regression coefficients, principal-components analysis (PCA), and the Borda method (Atkinson et al., 1997; Dasgupta & Weale, 1992; Noorbakhsh, 1998b; Panigrahi & Sivramkrishna, 2002; Slottje, 1991; Stanton, 2007; UNDP, 1990). The PCA method allows turning the original dataset into a new one where the variables lose their correlation to give maximum variability (Slottje, 1991). This methodology has been tested and replicated by many scholars (Stanton, 2007). The Borda method, is used an instrumental variable or hedonic approach and weights the attributes by the regression coefficient then, the ranks for the three components are added together, and the result is then ranked once more; the final result becomes the final composite index's values, and the Countries are then ranked based on their composite scores (Slottje, 1991; Stanton, 2007).

As Kelley (1991) points out, it is also crucial to remember that the weight of each variable in the composite index depends on the range chosen for each of the three indicators. Some authors then suggest a way to avoid mistakes following the choice of methodology by standardizing each indicator before synthesizing them together (Noorbakhsh, 1998b; Panigrahi & Sivramkrishna, 2002), while others create a vectorial space as we saw before (Palazzi & Lauri, 1998).

Stanton (2007) supports this analysis by listing some other methods used by UNDP or discussed by scholars: *“Other methods not on Slottje’s list include using a geometric mean (UNDP 1991); using D2 statistics to calculate a composite index based on the standardized actual values and the standardized targeted values of the three components (Mazumdar*, 2003), and multiplying the three indices, so that HDI will be more sensitive to low values in any one index (Sagar & Najam, 1998). In addition, Paul (1996) offers a Modified-HDI that raises each index to a given power before taking the arithmetic mean, so that the higher the power, the greater difference between countries’ index values”*.

The conclusion detailed in the following chapters is somehow surprising: even comparing different methods and methodologies to compose HDI differently, it appears that the average mean is a good method itself as it does not lose much of accuracy, but it gains much in comprehension (Noorbakhsh, 1998a).

4.6 2020 HDI, the Anthropocene revolution

As anticipated, 2020 has been revolutionary for the approach to Human Development; following research on the human pressure on planet earth, UNDP decided to quantify it and its impact on human well-being.

The report shows how the most vulnerable area of the planet reflects the vulnerability of people living there. Therefore, there is a positive correlation between poverty, vulnerability, and environmental precariousness (UNDP, 2020a).

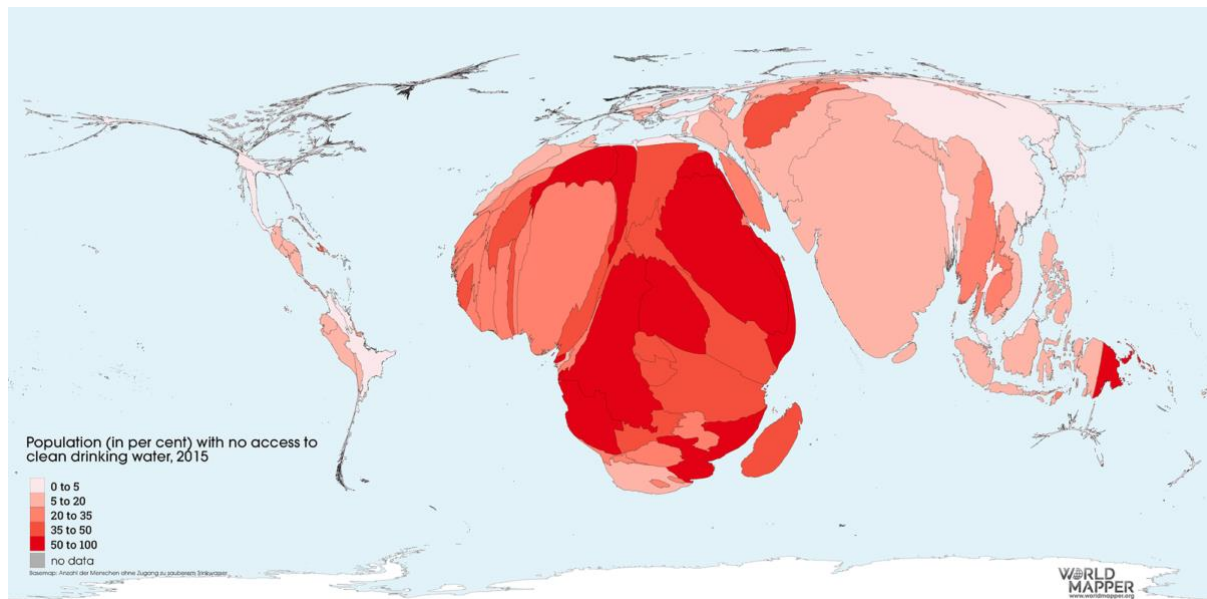


Figure 4 - No Water Access per capita. WorldMapper. Territory size shows the proportion of people living with no access to safe drinking water in 2015. Data sources: World Health Organization's Global Health Observatory (Water and sanitation) (last accessed March 2018). Datafile

As described in the report, however, “racial and ethnic disparities in pollution exposure have long been documented in several countries”. They might better be tackled by tools different from HDI as gender or ethnic-based HDI. One of the most important keys to the success of the Human Development Index is its simplicity and instant comprehensibility. Adding an in-country level of complexity analysis might affect its usefulness.

Moreover, the Planetary pressures–adjusted Human Development Index displays an almost total correlation with the ‘traditional’ HDI. The only few exceptions are countries with already high levels of HDI, and this might be dangerous as it could reduce the disparities

between countries with high and low HDI, not allowing to tackle both the internal problems of the wealthier countries nor the international dimension of the low HDI countries' issues.

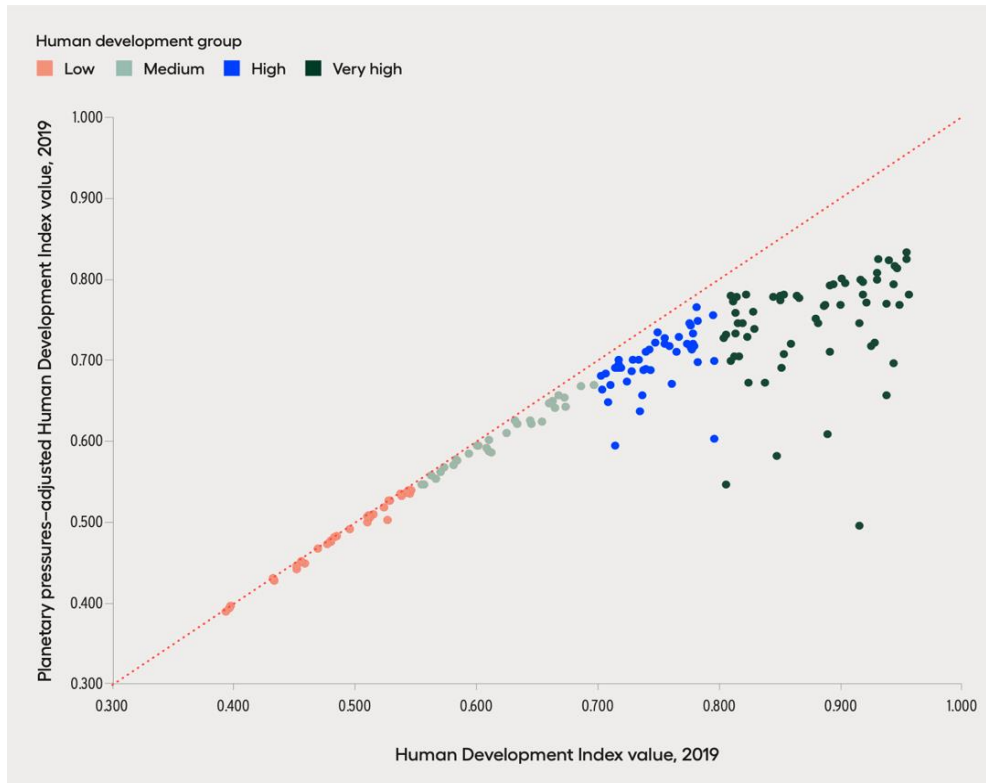


Figure 5 Planetary pressures-adjusted Human Development Index values are very close to Human Development Index values (UNDP, 2020a, p. 237).

Note: The Planetary pressures-adjusted Human Development Index covers 169 countries with the Human Development Index (HDI) values. Data on material footprint are not available for 19 countries with HDI values, and Guyana is excluded from the analysis due to unrealistically high values for material footprint.

Source: Human Development Report Office calculations based on HDI values from table 1 in the statistical annex, data on carbon dioxide emissions from GCP (2020), and data on material footprint from UNEP (2020d).

Nevertheless, as detailed in the report, it is essential to assess the environmental impact of man activity: *“The differentiated use of natural resources within societies and the resulting differences in environmental degradation are fundamental to understanding how inequalities can be passed from one generation to the next and the implications for the evolution of environmental pressures”* (UNDP, 2020a, p. 75).

5. Critiques to HDI

As imaginable and probably with some academic theoretical reasons, a broad set of critiques emerged about the Human Development Index. For instance, Castles (1998, p. 832) wrote: “[HDRs] dominant position in the global market for information on the social and economic world owes little to its intrinsic qualities and much to the packaging and promotional efforts of its multinational sponsor”. Although this critique is precisely the strength of the reports and HDI: due to its ‘marketability,’ Human Development Index has been able to draw attention from classical well-being measurements such as GDP and GNP and to focus and understand the broader idea of human development. Amartya Sen and Mahbub ul Haq themselves recognized this weakness/strength; the same remark was made by Streeten (1994, p. 235).

For the sake of the paper, we will analyze in detail the five ‘traditional’ critique areas identified by Stanton (2007, pp. 16-26):

- Poor data;
- Wrong indicators;
- Wrong specification;
- A wrong measure of income per capita;
- Redundancy.

Regarding the latest HDR and the Planetary pressures–adjusted Human Development Index we have already discussed some interpretation issues it may lead to; moreover, it is too recent for a comprehensive review of the critiques it caused.

5.1 Poor Data

The main issue in this regard is the effective capability of proper carefulness and correctness of collecting the required data for designing the HDI and the power of a homogeneous approach to this process (Aturupane et al., 1994; Stanton, 2007).

In particular, as Stanton (2007) points out in the literature, it has been carefully analyzed because of the irregularity of census data collecting, the potential for false reporting, and a lack of comprehensive coverage within countries, the census statistics used to calculate the HDI are unreliable (Ogwang, 1994; Srinivasan, 1994). Moreover, Srinivasan (1994), (Aturupane et al., 1994); Stanton (2007) discuss several other issues regarding the measurement and data collection process: from country-based definitions (think about literacy and primary education) such as quality of education measurement; to the ten-year census process; to the length of the school year in different education systems.

These critiques, however, appear to be specious as UNDP itself is aware of these limits and from 1990 endeavored several improvements and pushed countries and statistical actors for signs of progress in the field: “A major goal of the Report is to encourage national governments, international bodies and policy-makers to participate in improving statistical indicators of human development” (UNDP, p. 133).

5.2 Wrong indicators

As anticipated here and there within the paper, the easiest and maybe most common critique of HDI within the Human Development Report is about the selected indicators. This critique can assume the form of belittling the selected indicators or pushing for the need to integrate them with missing ones. About the latter aspect, it is essential to highlight how Stanton (2007) points out that it refers to four main areas:

- the extent of civil and political liberties (Atkinson et al., 1997; Dar, 2004; Dasgupta, 1994; Hopkins, 1991);
- distribution of income (S. Anand & A. Sen, 2000; Chatterjee, 2005; Chatterjee & Sen, 2000; O. H. Chowdhury, 1991; Hicks, 1997; *SRS Analytical Studies, Report No. 3*, 2003), access to health care, and access to educational opportunities;

- environmental impacts on well-being and access to natural resources (Atkinson et al., 1997; Paul, 1996; Sagar & Najam, 1998; UNDP, 2020b); and
- further educational measures to include both stocks and flows (Aturupane et al., 1994; Kelley, 1991).

UNDP, though, keeping faith in its principles (considering HDI a living instrument to assess and improve), tried to tackle this kind of critique by evolving the indicators throughout the years, for example, as described above by changing the parameters of the Literacy index or adjusting the income and life expectancy thresholds.

Moreover, although it did not add or substitute any index over the years, it created several complementary indexes in the HDR to assess specific topics and issues. Just to quote the most recent ones: “2022 Special Report on Human Security”, “2021 Global Multidimensional Poverty Index (MPI)” and others cited before tackling, for instance, gender and ethnic-based inequalities.

5.3 Wrong Specification

If it is true that the formula used to calculate the HDI is “arbitrary, unjustifiable, and incorrect” (Stanton, 2007); it is also true that most of these critiques had been formulated at the very beginning of the HDR journey, when the positive externalities carried out by the simplification, and the consensus fully emerged: (O. H. Chowdhury, 1991; Hopkins, 1991; Kelley, 1991; Ogwang & Abdou, 2003); Sagar and Najam (1998).

Moreover, the substitutability of the HDI components had severely been criticized, as using a simple and unweighted mean might be a questionable choice. If, on the one hand, it may be true that the scheme of arithmetic averaging of the three Index dimensions may lead to the misinterpretation of not considering them essential (Hopkins, 1991, p. 1471) (Sagar & Najam, 1998). On the other hand, it is also true that the weighting is always a political choice, and the limited advantages of proposed correction may bring along (Palazzi & Lauri, 1998)

would undoubtedly undermine the simplicity and comprehension of the tool (two of the main advantages it carries along).

To another pivotal critique, UNDP had been able to reply by evolving the Human Development Index, namely the "moving goal posts," which might have made it challenging to compare yearly reports and subtend that developing countries could be powerless in evolving them (Aturupane et al., 1994; Doessel & Gounder, 1994; Kelley, 1991; McGillivray & White, 1993; Noorbakhsh, 1998b; Paul, 1996; Rao, 1991; Sen, 1981; Trabold-Nübler, 1991; UNDP, 1990 through 2022). The relative deprivation issue was a solid critique of the Index, and UNDP had addressed it consistently since 1994 when it began to use fixed goal posts for assembling the Index: 25 and 85 for life expectancy, then changed to 20 and 85; for adult literacy, then changed as described above; 200 and 40,000 USD for GDP per capita, then become 100 (from 1995)/75,000 USD (Stanton, 2007).

As already described above, another critical critique regarding the design of HDI is about the arithmetic mean used to weigh its three components (Biswas, 2001-2002; Palazzi & Lauri, 1998). UNDP itself somehow admits that the perfect substitutability may confuse the reader when in 1997 presents one of the complementary indexes described above: the Human Poverty Index, which introduced a parameter (α) "*designed to take account of the degree of substitutability among the components [...] Substitutability would be diminished, it is argued, by as- signing a greater weight to the spheres in which the deprivation is greatest, in such a way that solving the problems involved in these aspects of poverty appears more urgent*" (Palazzi & Lauri, 1998, p. 194). Anyhow, UNDP, shareable or not, explained the methodology used already in 1991: "All three of the HDI components thus deserve equal weight" (UNDP, 1991, p. 88). Palazzi and Lauri (1998) do not accept UNDP interpretation as this seems more a postulate for complementarity between the HDI's components than a justification for their substitutability. Moreover, some authors refer to academic correctness when reminding that a

sound methodology shall be adopted if a composite index is sensitive to weights. If, on the other hand, the correlation of the index leads to a solid result, any part of the composite index will somehow carry similar pieces of information (Omar Heider Chowdhury, 1991; Louangrath, 2017).

Once more, it appears helpful to remember how the simplification of the method carries along a political appeal (Stanton, 2007): after all, also GDP and GNP synthetization methodology is not free from critiques and errors for the sake of the model. Please remember that, in fact, a model is a simplified representation of reality. Moreover, a simple average is a good tool for focusing on decreasing gaps between countries (Streeten, 1994).

Like the conclusions of (Noorbakhsh, 1998b)described in the chapter before; also Biswas (2001-2002)uses the PCA methodology, attempting to weight the three components of the HDI differently to find out that in the end, the simple arithmetic mean was a simplification good enough. The results were: Life Expectancy Index 34 percent, Education Index 34 percent; GDP Index 32 percent; this took them to write:

“Despite the simplistic methodology, it appears that the HDI is a good method of combining the component indexes and should be viewed, perhaps, with less skepticism [...] We interpret this finding as theoretical support for the HDI ranking system as a metric of international human development. Since the simple average of the component indexes yields rankings roughly equivalent to a more complex multivariate technique that selects the weights optimally, this appears to be a case where little is lost in the simplistic method, and much is gained in terms of straightforwardness. Indeed, while the strength of the HDI appears to lie in its easy comprehension, the weights used therein are consistent with multivariate techniques that generate weights optimally”.

So, also this kind of critique appears to be specious, despite its redundancy.

5.4 A Wrong Measure of Income Per Capita

This major critique has been addressed by UNDP across the years, changing its structure and parameters several times since its original formulation: a shortfall of the base 10 logarithm of GDP compared to a maximum and minimum income value

$$GDP - Index_i^{1990} = \frac{\log_{10}(\$4861) - \log_{10}(GDP_i)}{\log_{10}(\$4861) - \log_{10}(\$220)}$$

where HDI was equal to one minus the simple arithmetic mean of the three indices, and the maximum and minimum values were set to match the mean of the official poverty lines in nine OECD countries⁴, \$4861, and pair the GDP per capita of the country with the lowest average income, Zaire with \$220, respectively (Stanton, 2007; UNDP, 1990).

The reason for choosing logarithms in calculating the Y-Index has already been assessed: to consider the diminishing returns of income. Moreover, (UNDP, 1990) wanted to make clear that "*people do not need excessive financial resources to ensure a decent living*". Although, if this is generally true, this paper aims to extend this concept: there are undoubtedly some expenditures that are mandatory for decent living conditions, and without the possibility to afford them, a person might not be free to choose for its best (shelter, minimum calories, transport to work not to spend all day on the move).

Scholars generally accept this approach of diminishing marginal returns in HDI. Little debate stems from the topic, especially regarding income, since the first economists: Jacques Turgot, Johann Heinrich von Thünen, Thomas Robert Malthus, David Ricardo, and James Anderson. A little specious seems to critique that this approach shall be used for the other Index components as UNPD used it for H-Index, as seen before. Noorbakhsh (1998a, p. 519) reckons that the same approach might be used for literacy too, but also that: "*On the other hand, it may*

⁴ Australia, Canada, Germany, Netherlands, Norway, Sweden, Switzerland, United Kingdom, and United States

be also argued that the value of the returns to increasing levels of educational attainment can be influenced in both directions, decreasing or increasing, by other factors such as the level of industrialization, capital accumulation and productivity". So, once more UNDP approach seems the most suitable for the scope.

Anyhow, in order to arrive at the latest mathematical development, UNDP strolled through various steps: for instance, in 1991 used a modified Atkinson concave step function to represent the diminishing marginal utility of income:

$$Y - Index_i^{1991} = y^* + 2(GDP_i - y^*)^{1/2} + 3(GDP_i - 2y^*)^{1/3} + \dots$$

Where the bases of the exponential ($\varepsilon = 0, 1/2, 1/3$) are the extent of diminishing marginal returns to income, set for particular ranges of income for 0 to y^* , $\varepsilon = 0$; for y^* to $2y^*$, $\varepsilon = 1/2$; for $2y^*$ to $3y^*$, $\varepsilon = 2/3$, etc., and y^* is the average poverty line for nine OECD countries (Stanton, 2007; UNDP). This formula remained untouched for three years when a modified version (always Atkinson concave) was developed with threshold identification (UNDP, 1991).

Despite UNDP justification and methodological clarification, the Atkinson concave was largely criticized by many scholars⁵ mostly because of its discontinuity and because of its failure to conform strictly to diminishing returns⁶ (Stanton, 2007). The critiques continued until 1997 when Ravallion deconstructed the concave function because countries could perform poorly in one indicator while excelling in another component of the composite Index and end up with the same final HDI ranking, and until 1998 when Sager and Najam (1998) rejected the cap introduced in 1991.

It is worth reminding that in 1993, UNDP foresaw the Ravallion criticism and dissuaded to "*interpret the relative coefficients as trade-offs*": "*Superficially, it would be easy to say that*

⁵ McGillivray and White (1993), Ravallion (1997), Sager and Najam (1998), Bardhan and Klasen (1999), and Lüchters and Menkhoff (2000).

⁶ Trabold-Nübler (1991) and Bhatnagar (2001)

one extra year of life expectancy is 'worth' \$150 of income, but these are not choices open to an optimizing economic agent. Take a poor country with a per capita income as high as \$1,500...An extra year of life expectancy (above a median value of about 50 years) would be the same as a 10% growth in real per capita income. Neither of these two outcomes is likely in the short run, nor are they independent of each other in the real world. Thus, it would be wrong to interpret the coefficients as reflecting a "menu of policy choices" (UNDP, 1993, p. 110).

Once again, it is helpful to reiterate that UNDP welcomed the academic contribution and, in 1999, finally published the current formula described above, keeping open to the adjustment of the threshold and caps.

As Stanton (2007) reminds us, within the 1999 Human Development Report UNDP explain why the chosen approach better tackles the scope of HDI: *"the discounting is less severe; all levels of income are discounted uniformly; and middle-income countries receive recognition for increases in income that, under the Atkinson formula, would have been very heavily discounted"* (UNDP, 1999, p. 159).

5.5 Redundancy

Many authors⁷ attempted to demonstrate that the perfect substitutability between the indicators was due to their high degree of correlation. Therefore, HDI does not offer any additional information to the ones anyone can argue from GDP or GNP per capita (Stanton, 2007).

A strong visual and statistical support to truth and falsity to the previous support is given by Kelley (1991) who *"compares a ranking of countries by the HDI and the usual measure of economic development gross national product per capita (GNP/N), converted into US dollars using exchange rates"*.

⁷ See for instance Chowdhury 1991, Kelley 1991, McGillivray 1991, Dasgupta 1994, McGillivray and White 1993, Ogwang 1994, Srinivasan 1994, and Islam 1995, Hicks and Streeten 1979.

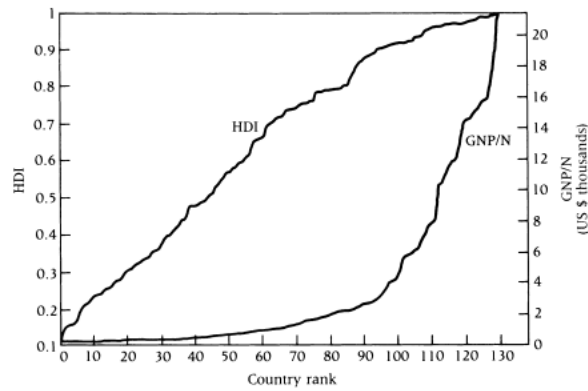


Figure 6 - Ranking of countries by HDI and GNP/N. (Kelley, 1991, p. 321)

It then appears clear that a substantial difference passes between the two lines as one (GNP) looks concave, much more adherent to the above-described Atkinson one, and the other looks like a logarithmic function (as in fact it is).

So, as it would appear logical, Kelley then compares HDI with the logarithm of GNP/N:

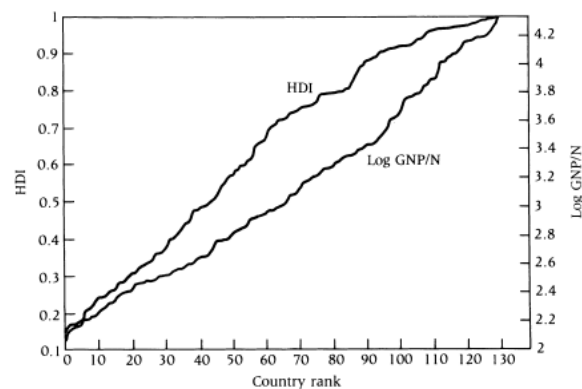


Figure 7 - Ranking of countries by HDI and log GNP/N. (Kelley, 1991, p. 323).

The result appears interestingly (although maybe not surprisingly), much less divergent. Some remarkable differences catch the eye when analyzing the results in detail, for instance, the results for the oil exporters with high GNP/N whose HDI is over ranked, the most stable social countries that appear to have high literacy rate or H-Index (Kelley, 1991). Anyhow, this graph seems a fair approximation of HDI.

On the other hand, Stanton (2007) explains why this approach is simply incorrect: Kelley ordered countries by HDI and GNP per capita values, each to each, and then drew the

strings related to the two Indexes, passing through all of the points for each measure thus ordered, as this would seem logical. The fact is that in the case of designing a vertical line at any given position in the graphs (figures 6 and 7), it will cross two specific points (one for each of the Indexes' lines) that do represent two different countries.

Stanton (2007) helped us again to understand the correct way of proceeding by correctly reinterpreting Kelley's information: "*plot[ting] HDI against GDP per capita using HDI ranks to order both sets of data (so that a vertical line passes through two points that each represent[s] the same country)*".

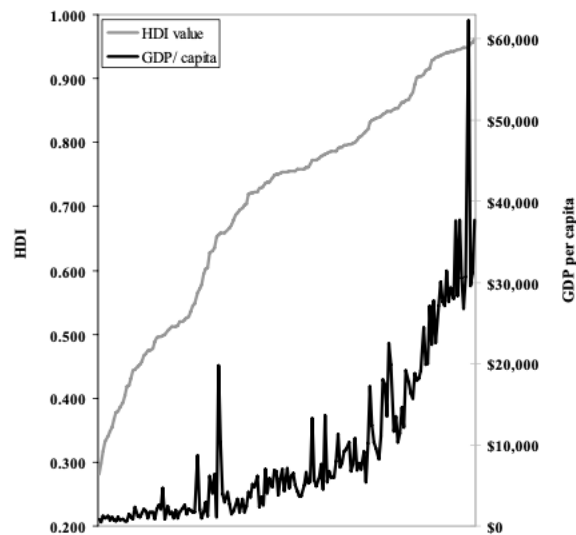


Figure 8 - HDI vs GDP per capita, by HDI rank (2003) (Stanton, 2007, p. 24).

The same approach has been used by her to graph HDI and log GDP per capita in order to trace Kelley's methodology:

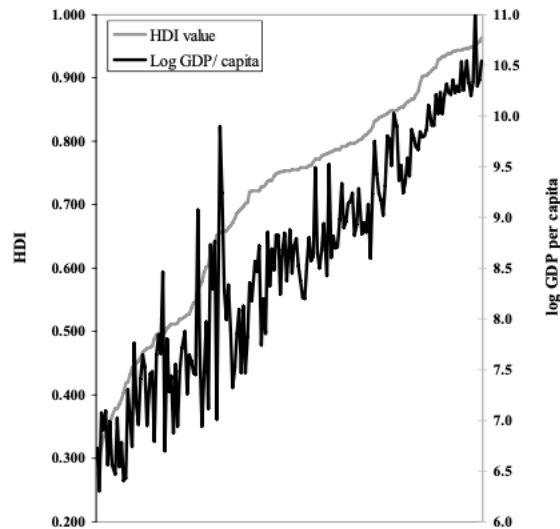


Figure 9 - HDI vs log GDP per capita, by HDI rank (2003) (Stanton, 2007, p. 25)

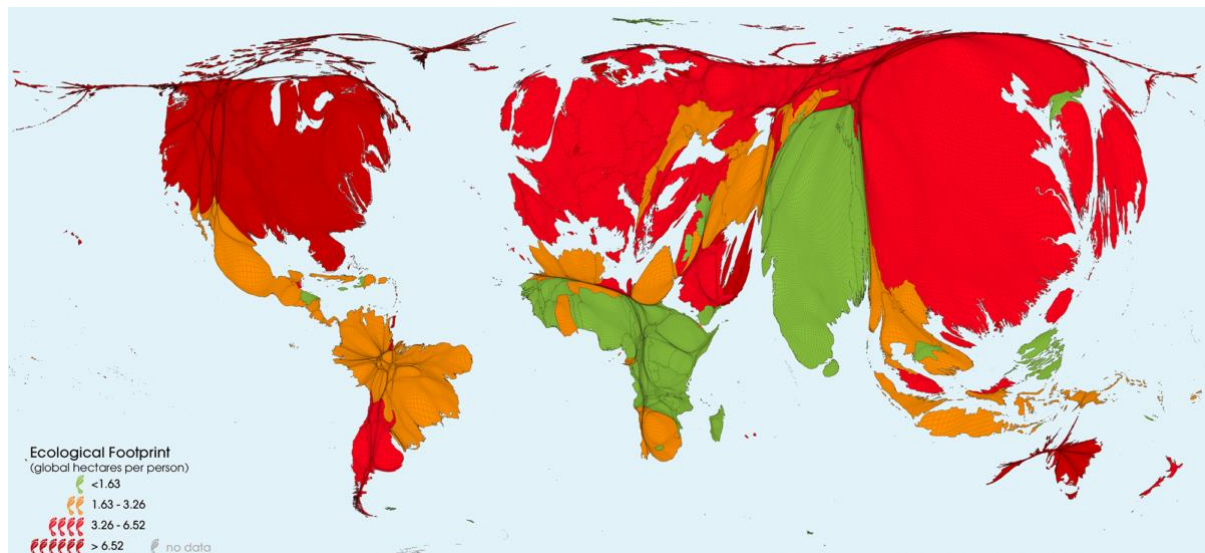
It jumps to the eye that, despite some higher correlation degree, the difference compared to what Kelley purposed is quite remarkable, and since the approach to designing this graph is fundamental to building his argument, it appears clear that Kelley's critique of redundancy is specious.

On the other hand, it is possible to appreciate the usefulness of the HDI with Stanton's approach, one can appreciate how: *"countries with income per capita greater than \$10,000 seem to display a positive correlation between HDI and income per capita. As GDP per capita increases, so does HDI, and vice versa. [...] a similar relationship [occurs] between HDI and log GDP per capita throughout the income range, but [...] is not consistent with the idea that all of the information in HDI could be expressed with GDP per capita or log GDP per capita. HDI provides additional, more nuanced information about human well-being"* (Stanton, 2007, pp. 22-27).

6. A retrospective of price evolution and subsistence income

The aim of this chapter is to give an overview of the price evolution of the latest three decades to understand how inflationary pressure can impact the income of both the most and less vulnerable. This may also help in understanding the consumption behavior and the pressure it exerts on the environment to understand if 2020 adjusted HDI is again a good approximation of the “classical” HDI.

Figure 10 - Ecological Footprint of Consumption 2019



Since prices suffer *excess volatility*, or, in other words, they change more than reasonable measures of value would allow expecting (Farmer, 2002; Shiller, 1992), and as Cutler et al. (1988) write most major price changes happened without of any news or important happening, it is reckoned that it is simply superficial not to assess their impact on income (mostly of vulnerable people).

Moreover, accordingly to World Bank data, Households and NPISH (Private Non-Profit Institutions Serving Households) final consumption expenditure per capita (at a constant 2015 USD) increased dramatically worldwide. This phenomenon was even more accentuated in sub-Saharan Africa, South America, and South-East Asia:

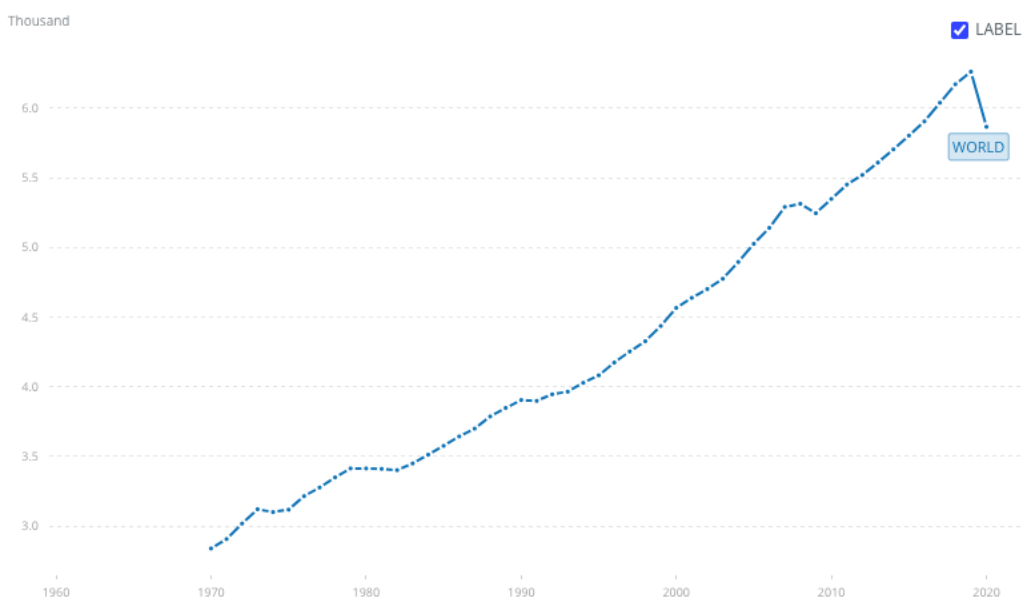


Figure 11 - Households and HPISH Final consumption expenditure per capita (constant 2015 US\$). World Bank national accounts data, and OCED National Accounts data files. EMBED CODE:

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<iframe src="https://data.worldbank.org/share/widget?indicators=NE.CON.PRVT.PC.KD" width='450' height='300'
frameBorder='0' scrolling="no" ></iframe>
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The situation appears to affect more the low-income and lower-middle income than other categories. This is even true in the years of higher pandemic, economic and environmental crisis; this cannot be underestimated when assessing the vulnerability in HDI:

Households and NPISHs Final consumption expenditure (annual % growth)			
Income Level	Most recent Year	Average % growth	Trend
High Income	2020	2,55	
Low & middle income	2020	4,92	
Low Income	2021	3,97	
Lower middle income	2021	4,12	
Middle income	2020	4,95	
Upper middle income	2020	5,10	

Table 1 - Households and HPISHs Final consumption expenditure (annual % growth). Own elaboration on World Bank national accounts data, and OCED National Accounts data files.

The methodology used by the World Bank to collect and aggregate Household consumption is the survey of countries. The most significant portion of expenditures, which amounts to more than 60% of the gross domestic product of most nations, is covered by the household consumption survey (GDP). It consists of a wide range of consumable household products and services. This survey also contains the private school and housing surveys, which are handled separately due to different data needs. The primary household consumption survey gathers prices for a variety of household consumption products and services, including food, beverages, tobacco, clothing, footwear, utilities, furniture, home appliances, pharmaceuticals, private health care services, motor vehicles, transportation services, electronic equipment, communication services, catering services, accommodation services, leisure activities, and other products and services. For the purposes of this survey, each economy categorizes the priced products as vital or less important for the consumption habits of its citizens. A private education survey gathers annual tuition costs for private elementary, secondary, and tertiary institutions as well as information on other educational services like private tutoring and foreign language instruction. A housing survey gathers information on the annual rental rates or housing stock. In each economy, rental prices are gathered for similar home types. This strategy has been shown to be effective in economies where the rented housing stock is indicative of the housing stock as a whole and when statistical organizations gather data on the rents paid for the various types of rented housing in most economies. Data on the amount and quality of the housing stock is gathered (World Bank, 2022c).

Since the world average inflation since 1960 it's been 20,33% and since 1990 (data of first HDR release) it's been 21,34% (Own Elaboration of International Monetary Fund, International Financial Statistics and data files) and the two figures are comparable in this paper only prices from 1990 will be considered (unless relevant discrepancies may emerge enlarging the range to be considered).

Again, below it will be represented the inflation for income, which, once again shows how the inflationary pressure is higher on low and middle income (upper middle income might have more instruments to face this challenge, although the truth of this claim will be tested with the “corrected” HDI):

Inflation, consumer prices (annual%)	
Income Level	Average % Inflation form 1990
High Income	2,42
Low & middle income	7,53
Low Income	6,30
Lower middle income	6,57
Middle income	6,16
Upper middle income	6,53

Table 2 - Inflation, consumer prices (annual %). Own elaboration. Database of International Monetary Fund, International Financial Statistics, and data files.

In the same period, the GDP per capita did not grow at the same rate. Au contraire, the only countries in which GDP per capita grew more than the inflation was the high-income ones. Own elaborations of World Bank data in the table below summarize the situation of the phenomenon just described:

Inflation, consumer prices (annual%)	
Income Level	Average % Inflation form 1990
High Income	1.48
Low & middle income	2.68
Low Income	0.50
Lower middle income	3.29

Middle income	3.45
Upper middle income	4.05

Table 3 - GDP per capita growth. Own elaboration on World Bank national accounts data, and OCED National Accounts data files.

It is self-evident that if HDI utilizes GDP per capita (Ln of it to consider the marginal diminishing marginal utility of income), it shall be able to include what can be done with that income; if it sets you free to choose for real.

6.1 Δ between per-capita-income and subsistence living cost as an indicator for HDI

For instance, South Sudan, a remarkably low-income country with a very high density of vulnerable people, faced more than 163% inflation annually from 2016 to 2019, with a peak of 380%. In the same period, the GDP per capita growth in SS was reported at 0.66667% on average (World Bank Data). It is self-explanatory that this trend is far from sustainable. Moreover, given that the other two Indexes of HDI are equal to previous years, the composite index must tackle this aspect too.

6.1.1 Food prices

Portillo et al. (2016) created a model that might be useful for the paper's sake starting from the critical insight that those divergences in the inflation rate of those goods and services with sticky prices are pricey from a welfare perspective since those nominal rigidities are the basis of inefficient oscillations in output. In contrast, goods with flexible prices (e.g., food) shall not be of concern as their fluctuations may reflect real economic needs such as shocks.

They introduced a subsistence floor for food consumption into a simple new-Keynesian model with two sectors (food and non-food), assuming that food prices are flexible and non-food prices are sticky. This approach allows Important Low Income Countries' characteristics to develop endogenously in the model when aggregate productivity rises. In line with the data

from microeconomics and a lengthy history of development macroeconomics (Cardoso, 1981). Manifestation of what Chenery and Syrquin (1975) called the structural transformation results from the inclusion of subsistence level in the model: when a nation is underdeveloped or its output is low, more labor (and money) must be devoted to supplying its basic food needs. The majority of the consumer price index (CPI) is made up of food. The economy can devote a lesser portion of total resources to the food sector as the nation grows and moves away from subsistence, allowing for the relative expansion of the other sector (non-food, i.e., manufacturing and services). As a result, food's proportion in the CPI decreases. Four main results are presented within that research:

1. *“Encompasses the USA and a group of African countries, by matching the pair of income per capita and food share in these countries. The economy is subject to a food productivity shock (the only real disturbance) and a shock to aggregate demand. Shocks are calibrated to replicate the properties of inflation in the USA, at business-cycle frequency”* (Chenery & Syrquin, 1975);
2. The researchers use a second-order estimate of the representative agent's utility function to build a welfare-loss function;
3. They discover that focusing on food inflation by targeting headline inflation entails more significant welfare losses in developing countries than in rich countries;
4. They then enlarge the model to investigate additional aspects of LICs, such as their restricted access to asset markets and potential for segmented labor markets. The welfare-based loss function is now expressed in this model's iteration as the weighted sum of the variance of core inflation and a different way to assess the output gap.

Some important conclusions can be drawn from this research regarding the purpose of this paper and the core idea of including subsistence costs in the Human Development Index:

- If incorporating food subsistence into a new-Keynesian model can help explain the higher volatility of inflation in developing countries and why that tendency can have a negative correlation with the business cycle, the whole subsistence costs of living (so inflation effects) have an impact on welfare and freedom of people choice;
- Targeting the incorrect measure of inflation results in more considerable welfare losses the closer the economy is to the subsistence threshold, raising the stakes for monetary policy in developing nations;
- "*Additional Low-Income Countries features (limited asset market participation and segmented labor markets) create the possibility of a trade-off between core inflation stability and a measure of output*" (Chenery & Syrquin, 1975).

Additionally, scholars proved that the inflation risk is significant when he chooses his consumption and portfolio to be close to the minimum wealth level. When inflation is excessive, a person's wealth loses value and may occasionally face constraints on what they can afford to buy to live (Gong & Li, 2006; Lim, 2013).

Moreover, as de Janvry and Kumar (1981) also write, inflationary pressures in the production's raw materials (e.g., fuel and power) and manufactured products can deploy their effects on the final prices of agriculture. Agricultural inflationary pressure, therefore, can be problematic as part of production is often used for self-sufficiency. The result is that when it is home consumption that mainly orients the agricultural sector (the market surplus is just a little slice of the whole production), the inflation of the production amplifies its effects on the

products. Some adjustments are then required to compensate for this cost and find new welfare and consumption equilibrium. This phenomenon may affect vulnerable people's freedom.

Just think about the magnitude of the welfare losses associated with inefficient water prices (Renzetti, 1992): yet 2 billion people live in homes without access to properly regulated drinking water. 1.2 billion of them have access to basic drinking water services; nearly half of the world's population, 3.6 billion people, does not have access to securely operated sanitation in their homes, of those, 494 million individuals defecate in the open, and 1.9 billion people have access to only rudimentary sanitation services; there are 2.3 billion individuals who lack access to basic hygiene supplies like household water and soap. This includes 670 million people who lack access to any sort of handwashing station (Centers for Disease Control and Prevention, 2022; UNICEF, 2022).

The negative outcome of redistributing water prices, however, is that it will probably not lead to an aggregate diminishment of water use (Renzetti, 1992).

6.1.2 Housing and sheltering prices

The same approach refers to housing both at a city level with gentrification phenomena and more rural areas where access to services has an impact on people's welfare. In fact, many studies demonstrated that the trend of growing income disparity is significantly amplified when considering income after housing expenses. For the lowest income quintile, the income shares of housing spending increased disproportionately, while it decreased for the highest income quintile. Lowering real earnings for low-income households, changes in household structure, declining relative costs of homeownership versus renting, and residential migration towards larger cities are all contributing factors. Compared to older cohorts at the same age, younger cohorts spend more on housing and save less, which will impact future wealth accumulation, especially for those at the bottom of the income distribution (Dustmann et al., 2021). Moreover, this research found that at the bottom of the income distribution, the share of income spent on

housing increased, while it decreased at the top. This tendency can be attributable to both changes in housing costs and compositional changes.⁸

Why shall people then accept such a situation if they were free to choose alternatives? Dustmann et al. (2021) answer in this way: “*We rationalise these findings using a simple consumer model where housing is a necessity and that allows us to derive and interpret the implications of changes in housing prices, subsistence level and household demographics for the link between income inequality before and after housing expenditure*”.

Although these studies investigate central Europe and the Anglo-Saxon world, it is not clear why the sociological approach to housing and decent living conditions shall be different elsewhere.

In fact, in several Third World cities, a sizable share, if not the majority, of low-income dwellings are occupied by renters. In spite of this, owner-occupied housing programs have remained the foundation of government housing policies. Little thought has been given to the reality that ownership is becoming unaffordable for an increasing number of low-income households as a result of declining real incomes and an increase in the cost of land and building materials (Kumar, 1996).

The problem is known for so long time that already in 1930 International Congress for the New Building, in its National Reports (about European countries) was debated; Teige (1987): “*The question of housing for the subsistence level population is foremost an economic and social problem. The actual housing need is so pressing in all countries that when it comes to the classes at subsistence level, we must use the term “housing destitution”. Based on the*

⁸ For similar results please see: Albouy, D., Ehrlich, G., & Liu, Y. (2016). *Housing demand, cost-of-living inequality, and the affordability crisis*. , Belfield, C., Chandler, D., & Joyce, R. (2015). *Housing: trends in prices, costs and tenure*. Institute for Fiscal Studies. , Goodman, L. S., & Mayer, C. (2018). Homeownership and the American dream. *Journal of Economic Perspectives*, 32(1), 31-58. , Kaplan, G., & Schulhofer-Wohl, S. (2017). Inflation at the household level. *Journal of Monetary Economics*, 91, 19-38. , Quigley, J. M., & Raphael, S. (2004). Is housing unaffordable? Why isn't it more affordable? *Journal of Economic Perspectives*, 18(1), 191-214.

national reports, it is necessary first of all to measure the extent of the housing shortage and to analyse its social characteristics”.

The issue is that given the fact that price increases in the current housing stock have no overall impact on welfare as results from a straightforward market clearing scenario in which the financial gains realized by sellers are precisely offset by the welfare losses suffered by purchasers (Bajari et al., 2005). So, it becomes even more important to tackle the individual welfare loss or gain as a result of pricing of “primary” goods for a happy and healthy life.

Moreover, housing and neighborhood have effects on subsistence sociability (Pereira & Queirós, 2014).

6.2 Inflation control as state policy

On the other hand, inflation may not be considered evil tout court. Sen (1999), for instance, warns about the danger of focusing too much on limiting public expenditure for price stability. This approach would be financial conservatism that sees (as anyway demonstrated) that high inflation rates hurt growth. Many financial conservatives have effectively used the connection with personal solvency, but Margaret Thatcher used it perhaps most eloquently (Buiter et al., 1983).

Although, Sen (1999) and Bruno (1993, 1995) demonstrated the fallacy of this argument as states are more solvent than privates through borrowing and other means. In practice, nearly all states do so nearly all the time. Moreover, if it is true that chronic inflation often resembles a problem: beyond a certain point, it becomes pretty difficult to stop becoming addicted; it is also true that the fallacy of the conservative argument that inflation per se is dangerous is demonstrated by the fact that it does not consider what must be sacrificed for that end.

So, it shall be studied in detail the composition of the inflationary phenomenon to understand whether it is caused by public intervention or economic shocks and if the first is the case, whether the positive outcomes overtake the negative externalities.

In both cases, the suggested correction of the Human Development Index, conceived as a "good policy index," might tackle the problem and understand the effects of prices dynamic on people's welfare without adding a remarkable level of complexity.

In fact, as proven above, inflationary pressures and prices, in general, are not neutral when we are not talking about the indifference curve of a basket of goods, but we are talking about primary goods for subsistence.

As already detailed, it is postulated that the subsistence living standard is subjective (the paper will attempt to set some minimal thresholds), so it is the behavior aimed at achieving, upholding, or exceeding this norm and, via that behavior, disclosing the standard. Any actor, though, shall be aware of the cost-opportunity of their choice in terms of alternatives. In fact, as Sharif (2003) writes based on Sen's concept of 'freedom of choice' and Arrow's concept of 'freedom as flexibility'⁹: "*below-subsistence living, individuals lack freedom of choice – while subsistence offers a reasonable minimum of this freedom, the freedom is completely lost at the lowest survival standard*".

Acknowledged this the following issue arising is the John Rawls' Indexing Problem¹⁰: if freedom depends on a composite index of social primary goods, which is the combination of those goods that can maximize the freedom of the least well-off?

Ferretti (2022) attempts to solve this problem by facing two main issues:

⁹ For more details see: Arrow, K. J. (1974). *The limits of organization*. WW Norton & Company. , Arrow, K. J. (1985). Distributive justice and desirable ends of economic activity. In *Issues in Contemporary Macroeconomics and Distribution* (pp. 134-156). Springer. , Arrow, K. J. (1995). A note on freedom and flexibility. *Choice, welfare and development: a festschrift in honour of Amartya K. Sen*, 7-15.

¹⁰ For more details, please consider: Rawls, J. (1971). A theory of justice. In: Cambridge, MA: Harvard University Press, Rawls, J. (1993). 2005: Political Liberalism. In: New York, Columbia University Press, Rawls, J. (2001). *Justice as fairness: A restatement*. Harvard University Press.

- Figuring out, theoretically, what circumstances make it permissible to replace essential social commodities or figuring out how often that happens. His answer was to argue that when all other factors are equal, the substitution rate of a good increases with decreasing marginal returns, which means that primary social goods have diminishing marginal substitution rates;
- “*Evaluating which acceptable substitutions are feasible in practice*”. He theorized that some substitutions may be conceivable in theory but impractical in practice due to scarcity restrictions, and the higher substitution rates rise, the more expensive substitutions become.

The conclusion of the article is that: “*plausible assumptions about social regimes and the feasibility of substitutions suggest that maximizing the freedom of the least well-off is likely to require giving them access to a social position with a balanced combination of all social primary goods*” (Ferretti, 2022).

Unfortunately, this approach is not suitable for this paper as there arose the need to include the problem of pricing of subsistence as a minimum threshold of freedom, and therefore an attempt to prefer some goods to be included in the basket must be done in the following chapter. Anyhow, it is useful to theorize possible solutions to John Rawls’ Indexing Problem.¹¹ So, in the paper, it will be taken somehow what Arneson (1990, p. 446) calls: “*social policy judgments based on ... claims to knowledge of what is good for people, and so of what value their resources shares really have, regardless of their own opinions on the matter*”. Of course, this approach has nothing like a paternalistic approach, and it will be based, as much as possible, on academic and policymakers' studies. The second possible solution: “*a subjectivist*

¹¹ For more details on the political implications of John Rawls’ Indexing Problem as tool of protection of freedom, please refer to: Blaug, R. (1986). John Rawls and the Protection of Liberty. *Social Theory and Practice*, 12(2), 241-258. <http://www.jstor.org/stable/23556593>

welfare standard” would lead to complications in theorization and calculation (if possible, at all) and therefore it would make the corrected HDI useless.

Moreover, it is not the aim of the paper to settle the debate about Rawls’ Problem: Whether Rawls is correct to believe that primary goods are the proper yardstick of justice has been the subject of intense dispute among experts for decades. Sen's capabilities approach has faced the most pushback, but the argument is far from over (Rashid, 2017).

7. Costs and prices to be included in the basic goods basket to calculate the subsistence level (or the John Rawls' Indexing Problem, solution for the 'corrected' Human Development Index)

In the following chapter, we will attempt to create a basic subsistence basket of goods to be considered in the income per capita index of HDI. For sure as anticipated food and housing are part of the basket, although careful consideration of what prices for them will be assessed.

Moreover, a discussion on transport and other goods and services to be included will be developed.

7.1 Food

World Bank collects data at the worldwide level of food prices including vegetables, fruits, and starchy staples. It then aggregates them at three levels of diet quality:

- a healthy diet;
- a nutrient adequate diet; and
- an energy-sufficient diet.

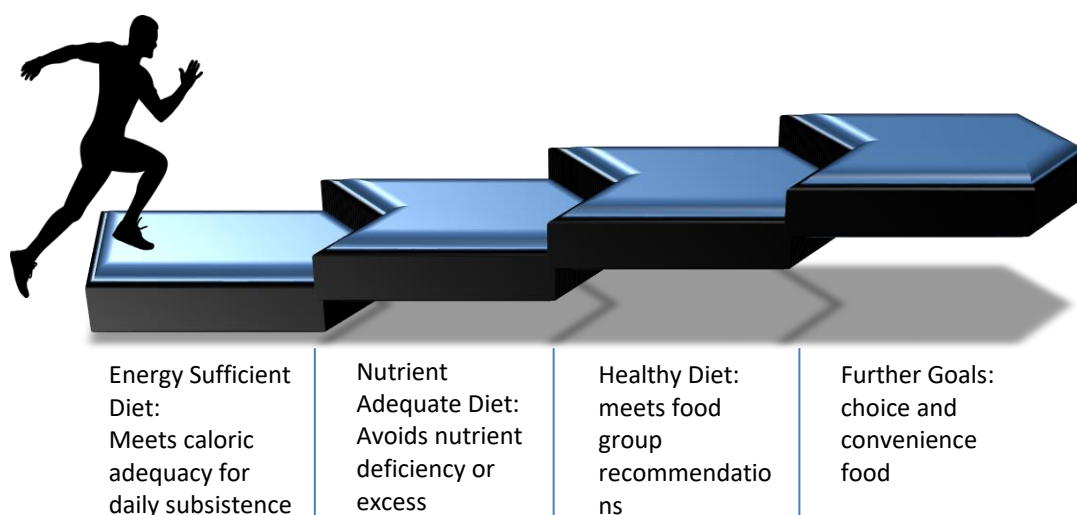


Figure 12 - Food prices and ladder of affordability. Own elaboration. Source: *Food Prices for Nutrition*, February 2022.

The Food Prices for Nutrition DataHub's diet cost and affordability indicators use the least cost combination of locally available foods to meet the needs of a representative adult requiring 2330 kcal (World Bank, 2022a). The idea is that food prices and income constraints create a ladder of affordability: food costs impose an insurmountable barrier to better diet quality. When healthy diets are unaffordable, then a nutrient diet may suffice. The least expensive food products required to maintain the level of diet quality are then used by the World Bank to determine how affordable each diet is. They favor using the degree of a healthy diet as a gauge of accessibility.

7.1.1 Cost indicators

All three dietary categories base the calculation of the cost per day on the needs of a median adult woman aged 19-30 in a good health as per the World Health Organization's definition.

Of course, the nutrient cost varies as the nutrients required differ on age, sex, and reproductive status (Bai et al., 2022);¹² interesting enough in Bai et al. (2022) "*total diet cost per day did not vary significantly with national income; however, in high-income countries, the composition of least-cost diet include more animal-source foods, whereas, in low-income countries, diets with more pulses, nuts and seeds, and fruits and vegetables provided the most affordable way to meet nutrient requirements*".

The following sections will resume the methodology used by the world bank to define the cost of each diet identified above as per World Bank (2022a) methodology.

¹² "In 2017, the global median of diet costs per day was US\$ 2.32 (IQR 1.95 – 2.76), with costs highest for adolescent boys aged 14-18 years at \$2.72 (2.31 – 3.15). For Females, median cost was highest for adolescents aged 14-18 years during pregnancy and lactation at \$2.64 (2.29 – 3.15) exceeding the cost for adult men aged 19-30 years. The global median of a diet cost per 1000 kcal was \$0.94 (IQR 0.80 – 1.12), and was higher for females throughout life course than for males, peaking for adolescent girls aged 9-13 years (\$1.17 [95% CI 1.15 – 1.19]) and women older than 70 years (\$1.18 [1.17 – 1.19]). Diet costs were more sensitive to requirements for calcium, iron, zinc, and vitamins C and E, as well as the upper bounds on carbohydrates and sodium" Bai, Y., Herforth, A., & Masters, W. A. (2022). Global variation in the cost of a nutrient-adequate diet by population group: an observational study. *The Lancet Planetary Health*, 6(1), e19-e28. .

7.1.1.1 Cost of a Healthy Diet

With enough variety and amount within and between food groups to provide nutrient sufficiency and safeguard against diet-related disorders, a healthy diet complies with the nutritional requirements outlined in dietary guidelines. The least expensive foods available in each category at each location and time are used to calculate the cost of adhering to food-based nutritional guidelines to gauge access and affordability (see "Methods and options to monitor the cost and affordability of a healthy diet globally" (Herforth, 2022)). The price of a healthy diet is the chosen metric for estimating diet costs because it uses the most cost-effective goods offered by neighborhood markets to satisfy dietary requirements for an active and healthy life, utilizing guidelines set by national governments worldwide. You may break down the daily total cost by food.

7.1.1.2 Cost of a Nutrient-Adequate Diet

To keep within the upper and lower limits for total protein, lipids, and carbs, as well as the essential vitamins and minerals needed to prevent nutritional shortages or toxicity, a nutrient-adequate diet must have a good variety of locally available foods. The least-cost nutrient-sufficient diet is calculated using linear programming based on nutrient requirements, not the food groups included in dietary recommendations.

7.1.1.3 Cost of an Energy-Sufficient Diet

Without sacrificing nutrient content or dietary rules, an energy-sufficient diet provides enough starchy staples for daily sustenance. The most economical local starchy staple is used in the lowest-cost variation of this subsistence diet, which balances energy levels but falls short of meeting nutritional requirements or other dietary needs.

7.1.2 World Situation

Currently (in the year 2020) around the world, around three billion people cannot afford a healthy diet.

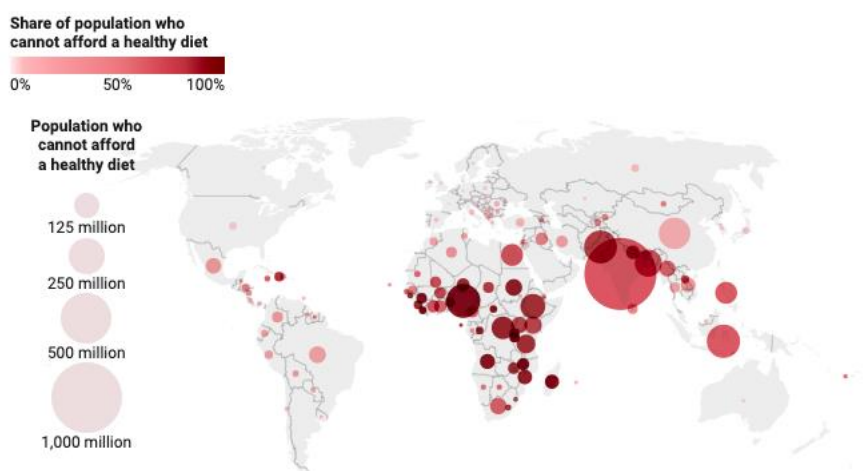


Figure 13 - Share of Population who cannot afford a healthy diet. World Bank (2022). Data Source: Food Prices for Nutrition DataHub, World Bank

In the present paper, it will not be investigated the Diet Affordability Index. Therefore, it will not be investigated the share of people who can effectively enjoy a healthy diet which, in terms of Sen's perspective of capability and freedom of choice, may not be an excellent choice. A person might be willing to choose not to have a healthy diet to feed more children or animals or give up some healthy food for religious reasons.

Moreover, the research aims to include the subsistence level in the Human Development Index. H-Index already tackles the dimension of a healthy diet. On the other hand, the calories sufficient diet might not be sufficient to be considered a sustainable subsistence diet from the nutritional scientific standpoint (Stigler, 1945).

The 'corrected' HDI will include the costs of an Energy-Sufficient Diet which, unfortunately, doesn't have as much data as the healthy diet. The table below resumes the price for the three diets at a world level:

Diets cost in USD, PPP 2017

	Cost of an energy sufficient diet per day (per year)	Cost of a nutrient adequate diet per day (per year)	Cost of a healthy diet per day (per year)	Cost of a healthy diet relative to the cost of sufficient energy from starchy staples per day (per year)
2017	0.31 (113.15)	1.60 (584)	2.26 (824.9)	7.36 (2,686.4)
2018	..	..	2.27 (828.55)	..
2019	..	..	2.33 (850.45)	..
2020	..	..	2.56 (934.4)	..

Table 4 - Food Prices Nutrition Data. Own elaboration. Data Source: World Bank Database

Even the table above seems to confirm the inflationary pressure on incomes with an increase of the cost for a healthy diet of 13% in just four years.

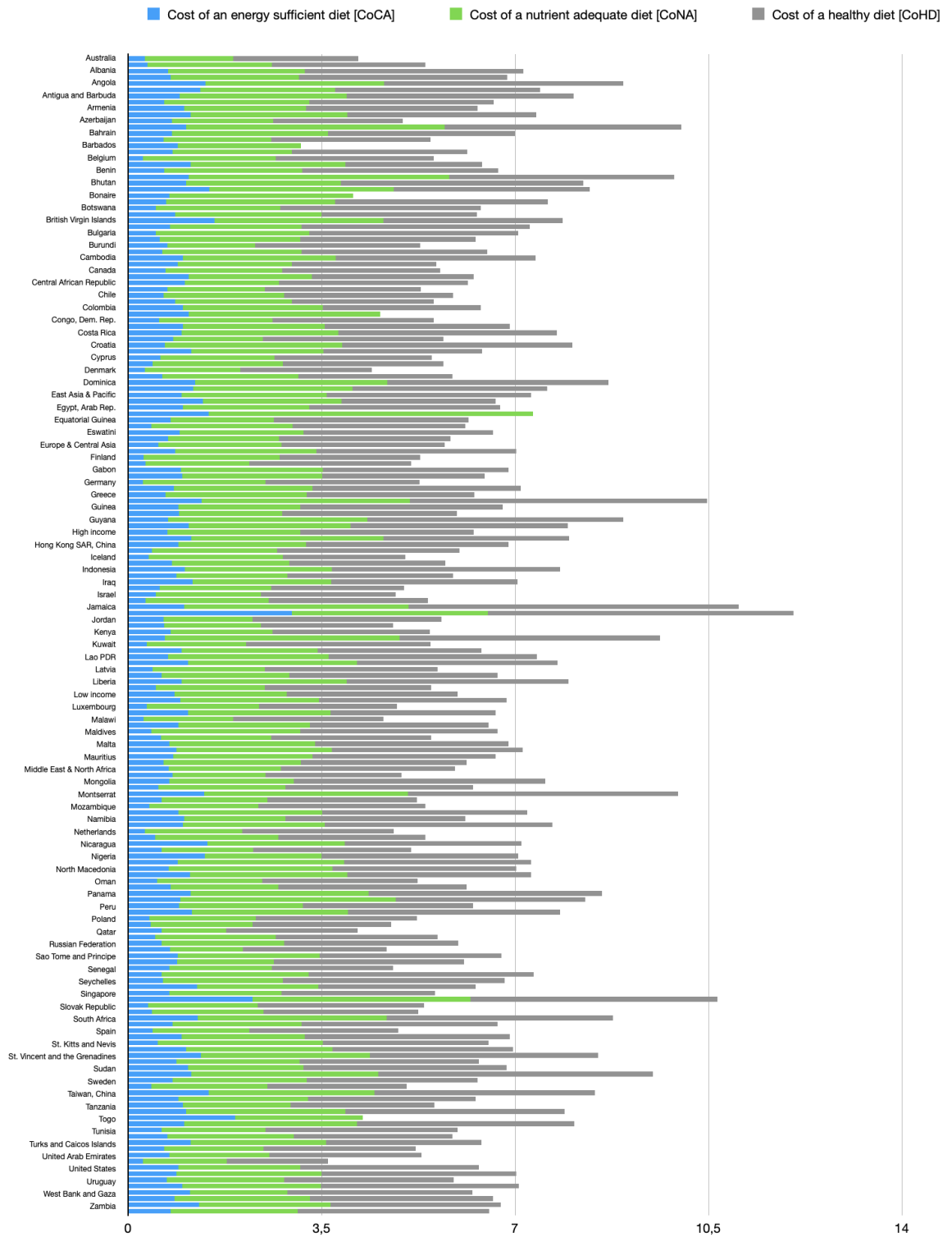


Figure 14 - Comparison of costs of Diets in the world. Own elaboration. Data Source: World Bank DataBank (2022).

7.2 Housing

The reason for including housing in this composite index is that living in a community without a proper shelter would be impossible. Since prehistoric times, sheltering has been one of the primary needs of the human being.

Moreover, several international human rights treaties include the right to sufficient housing as one of their core principles. Housing rights are not a recent creation in human rights; on the contrary, they have long been seen as crucial to preserving human dignity and well-being. The most authoritative international human rights declarations include housing rights, which are fundamental to all other human rights in general (United Nations Housing Rights Programme, 2003).

The most critical example is what is included in Article 25 of the Universal Declaration of Human Rights (UN General Assembly, 1948):

“Everyone has the right to a standard of living adequate for the health and wellbeing of himself [herself] and of his [her] family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his [her] control”

Another source is the International Covenant on Economic, Social and Cultural Rights (UN General Assembly, 1966), which, in Article 11 declares:

“The State parties to the ... [ICESCR] recognize the right of everyone to an adequate standard of living for himself [herself] and for his [her] family, including adequate food, clothing and housing, and to the continuous improvement of living conditions. The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent”.

Besides these examples, many other international law sources have faced the issue and this might be exemplary of how important the issue is for human freedom.¹³

The main problems with the cost of housing regard the lack of data and the inhomogeneity of housing and living conditions. So, concerning the paper, the leading research and regional indicators will be considered. Moreover, in different countries and regions, it might be cheaper to buy a house, while in others, it might be more convenient to rent. So, it will be considered the Household Expenditure per capita, PPP-based (US\$ 2017), on actual and imputed rentals for housing; maintenance and repair of the dwelling; water supply and services related to the dwelling; and electricity, gas, and other fuels plus expenditure by nonprofit institutions serving households (NPISHs) on housing plus general government expenditure on housing services provided to individuals as collected by World Bank.

The discussion about the adequacy of the standard of living is long and often misleading, and any decision in this regard might make the paternalistic mistake of deciding in lieu of people's best options. The discussion about the adequacy of the standard of living is long and often misleading, and any decision in this regard might make the paternalistic mistake

¹³ For other international law references, please look: United Nations. (2006). International convention on the elimination of all forms of racial discrimination. Article 5 *"In compliance with the fundamental obligations laid down in Article 2 of this Convention, State Parties undertake to prohibit and eliminate racial discrimination in all of its forms and to guarantee the right of everyone, without distinction as to race, colour, or national or ethnic origin to equality before the law, notably in the enjoyment of the following rights:...(e) in particular...(iii) the right to housing"*.

UN General Assembly. (1979). Convention on the elimination of all forms of discrimination against women. Retrieved April, 20, 2006. Article 14(2)(h): *"State Parties shall take all appropriate measures to eliminate discrimination against women in rural areas in order to ensure, on a basis of equality of men and women, that they participate in and benefit from rural development and, in particular, shall ensure to such women the right...(h) to enjoy adequate living conditions, particularly in relation to housing, sanitation, electricity and water supply, transport and communications"*.

UN General Assembly. (1989). Convention on the Rights of the Child. *United Nations, Treaty Series, 1577(3)*, 1-23. Article 27(3): *"State Parties in accordance with national conditions and within their means shall take appropriate measure to assist parents and others responsible for the child to implement this right and shall in the case of need provide material assistance and support programmes, particularly with regards to nutrition, clothing and housing"*.

UNHCR. (1951). The Refugee Convention <https://www.unhcr.org/4ca34be29.pdf> Art. 21 *"As regards housing, the Contracting States, in so far as the matter is regulated by laws or regulations or is subject to the control of public authorities, shall accord to refugees lawfully staying in their territory treatment as favourable as possible and, in any event, not less favourable than that accorded to aliens generally in the same circumstances"*.

of deciding in lieu of people's best options. Anyhow, it is worth to remark what the Committee on Economic Social and Cultural Rights (1991), in its General Comment No. 4, says about the definition of adequate house interpreting the legal principle contained in Article 11(1) of the ICESCR. The right to appropriate housing should not be understood in a limited or restrictive way that equates it, for instance, with the *shelter* offered by just having a roof over one's head or with views that define shelter entirely as a commodity, according to the Committee. The right to appropriate housing should be viewed holistically, including the right to live somewhere in safety, peace, and dignity, the Committee says (United Nations Housing Rights Programme, 2003).

It is highlighted once more that data are not available for all the countries, so for the ones where data are not collected it will be used the latest available median price to income of the region. The reason why it is particularly hard in Africa and Asia to harmonize the data,

For OCED countries de definition of the indicator is: *“Individual consumption expenditures are classified by purpose using the UN Classification of Individual Consumption by Purpose (COICOP). The housing expenditures category, called ‘Housing, water, electricity, gas, and other fuels’, is one out of the twelve categories included as part of individual consumption expenditures. Housing and energy expenditures consist of actual rentals for housing, imputed rentals for owner-occupied housing, housing maintenance and repairs, as well as costs for water, electricity, gas and other fuels. The order of the categories in COICOP are designed to broadly reflect differences in the responsiveness of expenditures to changes in household income, known as ‘income elasticity of demand’. The types of expenditures with low responsiveness where percent changes in expenditures are generally less than percent changes in income are at the top of the categories; the expenditures that generally increase at a higher rate than changes in income are ranked lower. Thus, food and non-alcoholic beverages, which reflect purchases for home use, and which have a low-income elasticity, are at the top of the*

hierarchy, and restaurant meals, which have a relatively high-income elasticity, are much lower in the hierarchy” (OECD, 2014).

The cost of housing significantly impacts how people and households live. It is crucial to be concerned about housing affordability, particularly when property prices, rents, and energy expenses are rising rapidly. One of the most critical parts of a household's assets and expenditures is its housing. As a result, rising housing costs can make it more difficult for households to maintain their current standard of living and boost the wealth and financial security of those who already own their primary dwelling. An easy way to determine how much money is spent on housing services and to compare such costs over time and between nations is to present housing expenditure as a percentage of adjusted disposable income. Although imputed rents are up for debate, comparability is good. Between nations, the adjusted disposable income is quite comparable. In Australia, Chile, New Zealand, Switzerland, and South Africa, housing consumption data are national rather than domestic. The data for Australia, Chile, Mexico, and South Africa include the NPISH sector (non-profit institutes serving households) (OECD, 2014). The database for these data is: OECD (2013), “Detailed National Accounts: Final consumption expenditure of households”, OECD National Accounts Statistics (database), <http://dx.doi.org/10.1787/data-00005-en> (OCED, 2013).

For those countries, where national accountability is reliable, it will be considered the indicator 9060000 of the World Bank Database titled: “Household expenditure on actual and imputed rentals for housing; maintenance and repair of the dwelling; water supply and services related to the dwelling; and electricity, gas, and other fuels plus expenditure by nonprofit institutions serving households (NPISHs) on housing plus general government expenditure on housing services provided to individuals”.

This database follows the same approach as OCED’s one as it is based on the UN Classification of Individual Consumption by Purpose and is used to categorize individual

consumption expenditures (COICOP). One of the twelve categories included as part of individual consumption expenditures is the housing expenditures category, which is referred to as "Housing, water, electricity, gas, and other fuels." The classification of the metadata is: *“Purchasing power parity (PPP)-based national accounts expenditures per capita in US dollars are expenditures (PPP-based) divided by total mid-year population (defined as the de facto population, which counts all residents regardless of legal status or citizenship). PPP-based expenditures in US dollars are obtained by dividing expenditures in local currency units by PPPs (US\$=1). A comparison of PPP-based expenditures reflects only volume differences between economies as price differences between economies are eliminated. Further information on the calculation and use of PPPs, and the cross-country comparisons they enable, can be found at icp.worldbank.org.”* (World Bank, 2022b).

The use of PPP USD is because the cost of homes and the wages used to pay for them are typically expressed in the local currencies of the nations included in the analysis, comparing housing affordability across various African countries is more challenging. Market exchange rates also tend to be much more volatile over time than housing prices and salaries represented in local currency, and exchange rate fluctuations are rarely consistent with differences in inflation. This is particularly true for nations with relatively small export bases, of which there are many instances in Africa, whose currencies are adversely affected by the going rates for their primary export commodities on global markets.

Although imputed rents are up for debate, comparability is good. Between nations, the adjusted disposable income is quite comparable.

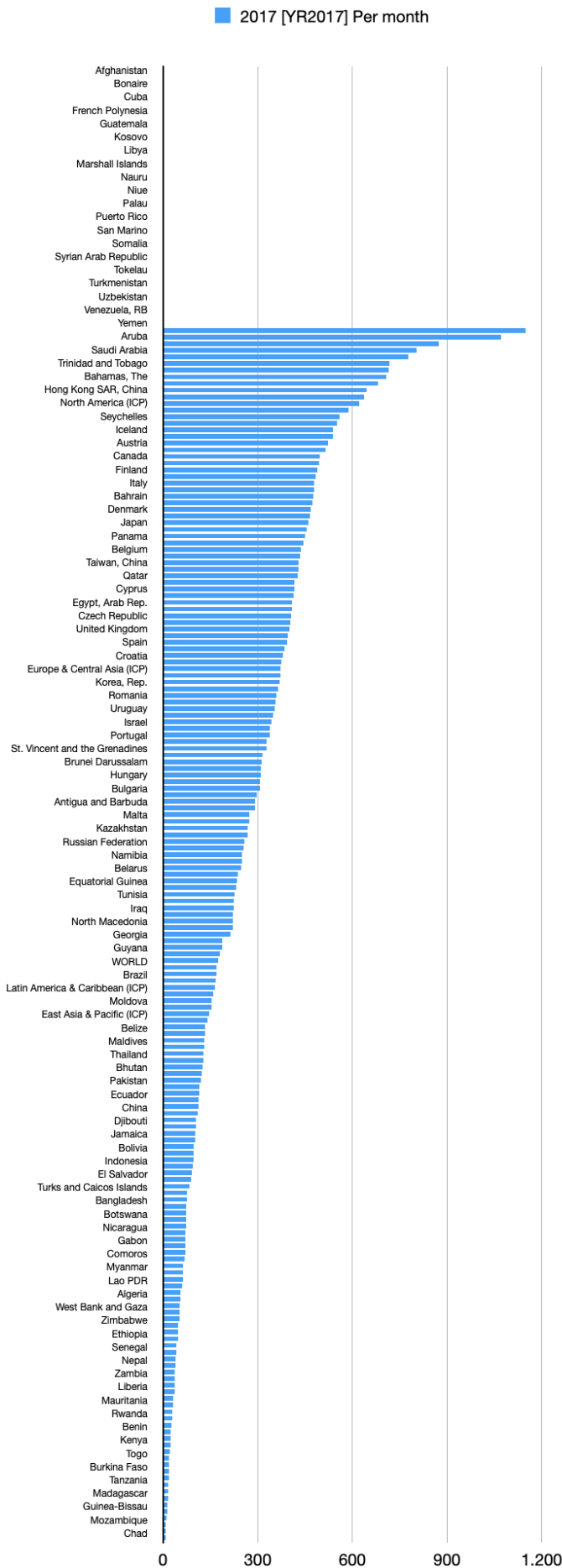


Figure 15 - Household expenditure in Housing. Own Elaboration. Data Source: World Bank DataBank (2022).

For those countries where these data are not available (see graph before for examples), the median price of the region will be applied as the house price to income ratio: the quotient of median house value (including land) divided by median annual income although less recent. Both formal and informal, as identified by UN Human Settlements Programme (UN-Habitat):

Changes in rent and household income of renters			
Region	Median Rent \$	Household Income Renters \$	Rent to Income Ratio %
Africa	455	940	50.3
Arab States*	1,955	6,044	24.9
Asia-Pacific	4,792	4,237	71.7
HIC	4,661	17,531	27.7
LAC	1390	3,378	38.4
Transitional	500	2,816	17.9

Table 5 - Changes in rent and household income of renters, 1993-1998. Own Elaboration. Includes only those 69 cities for which all numbers were available or could be estimated. For HIC and Arab States the sample is not significant. (Global Urban Observatory, 1998)

In this classification there is a weak point of the research as the lack of data, despite their high level of comparability, might significantly affect the result. On the other hand, the reasoning behind is quite simple and will not add any level of complexity to HDI. Therefore, further research may mitigate possible negative outcomes due to the poor data (that anyhow, kind of not stopping HDI in the past).

7.3 Transport

A complete range of costs to define the minimum subsistence level of income shall somehow include transport costs as they are mandatory in most contemporary societies: from costs for going and coming back to school and work; to the costs faced to sell goods to markets (Building roads has served as a starting point for enhancing efficiency and profitability)

(Bonsu, 2014; Pingali, 1997); to, as Gollin and Rogerson (2014) write, how they affect productivity in subsistence agriculture.

This is not a particularly new intuition, nor is it limited to modern societies, although highly diversified. Still, the transport modalities affected the evolution of past societies as, for instance: *“The incorporation of watercraft transport and aquatic resources in [...] Pastoral Neolithic sites affords a greater understanding of subsistence, mobility, and economy in this important period in East African prehistory”* (Ndiema et al., 2011, p. 1).

The issue of transport has also strong implications in terms of gender equality. For instance, Anand and Tiwari (2006, p. 3) write: *“Women form an important part of the workforce originating from the slums in the city of Delhi, India. [...] women spend more time travelling on slower modes of transport to access work; the faster modes are more expensive. Their time–poverty demands they look for work at shorter distances from home. [...] their ability to contribute to the alleviation of their standard of living and their status in society is severely curtailed by their limited mobility and the constrained accessibility to the transport system of the city. This transport deprivation becomes further exacerbated by the process of forced eviction and relocation of low-income households to the periphery of the city, causing the women to lose livelihood opportunities”*.

So, once it is agreed that transport is definitely affecting human welfare and it does so mostly for the most vulnerable, the problem of quantifying a minimum level of subsistence transport expenditure arises. Two are the main indicators that might be taken into consideration as given by World Bank DataBank:

- (1107000) Transport: This ICP classification heading covers expenditures for Motor cars; Motorcycles; Bicycles; Animal drew vehicles; Fuels and lubricants for personal transport equipment; Maintenance and repair of personal transport equipment; Other services in respect of personal transport equipment; Passenger

transport by railway; Passenger transport by road; Passenger transport by air; Passenger transport by sea and inland waterway; Combined passenger transport; Other purchased transport services.

- (1107300) Transport services: National accounts expenditure value is the best possible estimate provided by the national implementing agency. This ICP classification heading covers expenditures for Passenger transport by railway; Passenger transport by road; Passenger transport by air; Passenger transport by sea and inland waterway; Combined passenger transport; Other purchased transport services (World Bank, 2022b).

For the sake of the essay, seems more suitable the second indicator as personal transport equipment, bicycle, or animal included, might be a luxury that not everyone might be capable or willing to pay for. On the other hand, Transport services can be paid for by individuals directly or through taxation, and in both cases, it is mandatory for mobility needs.

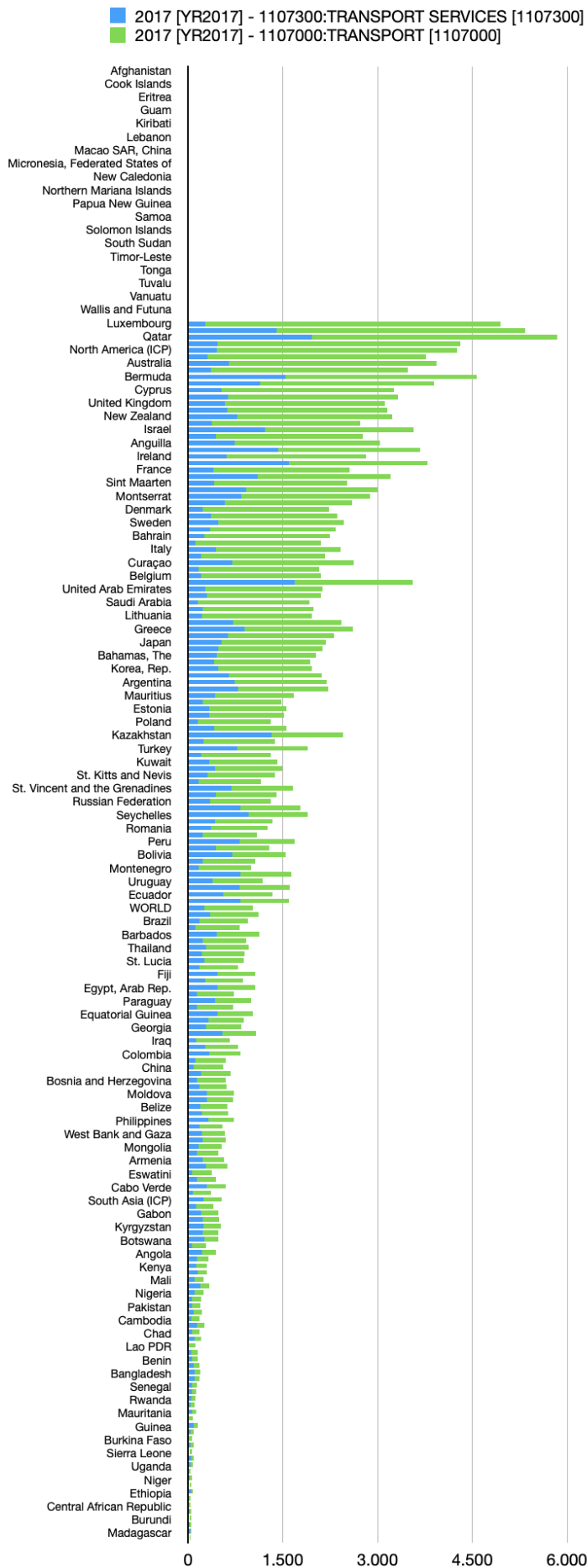


Figure 16 - Transport and Transport services Cost per Capita. Own Elaboration. Data Source: World Bank Databank (2022).

Like before, for those countries where data are not available, the mean cost of the region weighted with the mean cost of transport in countries with similar income will be applied.

7.4 Costs considered not included

As anticipated in the introduction, several other costs might be considered of capital importance for well-being and basic needs satisfaction: Cost of living, Bread and cereal, Fish and seafood, Clothing, Healthcare, Communication, Recreation and culture, and Education, ...

All these cost categories, though, are not essential in terms of survival possibility: following Sen's conceptualization of capability, in fact, the self-realization of individuals does not pass through clothing or expensive recreational activities.

Moreover, studies have demonstrated how welfare losses in economic shocks that affect 'superficial' consumption are quite irrelevant (Leith et al., 2012). Deep habits in consumption are in fact more suitable to be anelastic than superficial ones (Cantore et al., 2014) while subsistence expenditures might be more elastic than both of them for the more vulnerable purchaser. This dynamic might be interesting to be investigated. On the supply side, although a small number of scholars¹⁴ have claimed that farmers in developing nations respond favorably to price and income incentives, the majority¹⁵ seem to feel that supply is either elastic to price or has no elasticities at all. In the writings of structuralists on inflation, the notion that farmers do not respond to economic incentives recurs frequently; it is also a key argument for

¹⁴ Daly, R. (1960). Appraisal of Pakistan's Second Five Year Plan. *AID monograph, Karachi.* , Krishna, R. (1963). Farm supply response in India-Pakistan: A case study of the Punjab region. *The Economic Journal*, 73(291), 477-487.

¹⁵ Grunwald, J. (1961). The 'Structuralist' School on price stability and development: the Chilean case. *Latin American Issues*, 110-111. , Khatkhate, D. R. (1962). Some notes on the real effects of foreign surplus disposal in underdeveloped economies. *The Quarterly Journal of Economics*, 186-196. , Nair, K. (1961). Blossoms in the Dust (The Human Element in Indian Development.), London, Gerald Duckworth and Co. In: Ltd, Olson, R. (1960). Discussion: Impact and Implications of Foreign Surplus Disposal on Underdeveloped Economies. *Journal of Farm Economics*, 42(5), 1042-1045.

those who support economic growth through industrialization and hefty agricultural taxes (Falcon, 1964).

Moreover, values of in situ land used for sustenance and other purposes are vastly undervalued, and pressure to develop land for the production of commodities nearly always predominates (Dick, 1996).

8. Calculation of the corrected Human Development Index

In the following chapter, the calculation methodology will be explained. Then an overview of the results will be shown and in the following one some conclusions will be drawn.

The calculations had been made using the Microsoft Excel tool. Given the simplicity of the formulas involved no macro was needed.

Starting from the UNDP (2020b) report the methodology for the definition of the indexes had been extrapolated:

	A	A	B	C	D	E	F	G	H
1	Calculating the human development index (HDI)								
2									
3		Data				Answers			
4									
5									
6									
7									
8									
9									
10			Mean years of schooling for ages 25 and above	Expected years of schooling	GNI per capita (PPP US\$)	Life expectancy index	Education index	GNI index	Human development index (HDI) value
11		Life expectancy at birth (years)	(years)	(years)	(PPP US\$)				
12									
13	Country A	68,0	12,4	14,0	7.770	0,738	0,802	0,658	0,730
14	Country B	48,8	10,7	16,2	10.070	0,443	0,807	0,697	0,629
15	Country C	60,8	6,5	9,0	1.940	0,642	0,467	0,448	0,512
16	Country D	49,4	5,5	10,1	1.990	0,452	0,464	0,452	0,456

The three indexed are therefore calculated using the following formulas:

- Life Expectancy Index: $= (\$B13-20)/(85-20)$
- Education Index: $= ((\$C13/15)+(SE(\$D13>18;18; \$D13)/18))/2$
- GNI Index: $= (LN(\$E13)-LN(100))/ (LN(75000)-LN(100))$
- Human Development Index (HDI) Value:
 $= MEDIA.GEOMETRICA(\$F13; \$G13; \$H13)$

From this starting point the GNI Index deperated from the subsistence costs had been defined as follows:

	A	B	C	D	E	F	G	H	I	J	K	L
1	Country		GNI Per Capita	Diet	Housing	Transport	Missing data	Regional Average Diet	Regional Average Housing	Regional Average Transport		GNI-Subsistence
2	1	Norway	66.494	1,12	5464,64	628,03						\$ 59.992,06
3	2	Ireland	68.371	0,57	4279,39	604,95						\$ 63.278,93
4	2	Switzerland	69.394	0,42	6610,72	626,60						\$ 62.003,63
5	4	Hong Kong, China (SAR)	62.985	#N/D	#N/D	#N/D	xyz	0,804	884,58	241,86		\$ 61.564,87

For seeking the right figures in the three datasets described in previous chapters (Energy Sufficient Diet, Housing, and Transport) the following formula had been used:

- Energy Sufficient Diet: =CERCA.VERT(B2;'Energy Sufficient Diet'!\$A\$2:\$J\$187;7;FALSO)
- Housing: =CERCA.VERT(B2;Housing!\$A\$2:\$H\$223;7;FALSO)
- Transport: =CERCA.VERT(B2;Transport!\$A\$2:\$C\$223;3;FALSO)

In case some data were missing ('x' for diet; 'y' for Housing; and 'z' for Transport), the regional average for each of the three dimensions had been used using the same principle within the same datasets.

So, the final GNI-Subsistence value was equal to: =C2-(D2*365)-E2-F2 meaning the Per capita income without the subsistence costs. Consequentially data had been pasted within the proper column to obtain the corrected HDI:

As for some (9, marginal number) countries the subsistence expenditures were higher than the per capita income (mostly due to the housing price) for those countries the housing costs had been calculated as regional average ratio to income: =SE((C28-(H28*365)-I28-J28)>0;(C28-(H28*365)-I28-J28);(C28-(C28*,reg.ave.to.income.ratio)-(H28*365)-J28)).

	A	B	C	D	E	F	G	H	I	J
1	Calculating the human development index (HDI)									
2										
3	Data					Answer				
4						Life expectancy index	Education index	GNI index	Human development index (HDI) value	
5	Switzerland	83,8	13,4	16,3	62.004	1,003	0,900	0,971254816	0,957	1
6	Norway	82,4	12,9	18,1	59.992	0,960	0,930	0,966272892	0,952	2
7	Ireland	82,3	12,7	18,7	63.279	0,959	0,922	0,974330248	0,951	3
8	Hong Kong, China	84,9	12,3	16,9	61.565	0,998	0,880	0,9701821	0,948	4
9	Sweden	82,8	12,5	19,5	47.583	0,988	0,918	0,93126629	0,945	5
10	Liechtenstein	80,7	12,5	14,9	125.947	0,933	0,832	1,078302641	0,943	6

To identify the right values of the corrected GNI Index and HDI this was the procedure:

- =SE(E5>0;(LN(\$E5)-LN(100))/ (LN(75000)-LN(100));(LN(100)-LN(100))/ (LN(75000)-LN(100)))

- =SE(H5>0;MEDIA.GEOMETRICA(\$F5;\$G5;\$H5);MEDIA.GEOMETRICA(F5;G5;(LN(Corrected!K11)-LN(100))/(LN(75000)-LN(100))))

The above lines had been used just to double-check whether any mistake or discrepancy appeared. In the end, the results are totally overlapping with the easier and more immediate formulas:
$$=(LN(\$E13)-LN(100))/\quad (LN(75000)-LN(100))$$
 and
$$=MEDIA.GEOMETRICA(\$F13;$G13;$H13).$$

8.2 Results

In the end, the outcome obtained designed a new ranking with some interesting results:

Rank		Human Development Index (HDI)		Corrected Human Development Index (HDI)	Δ		Corrected HDI rank	Δ
VERY HIGH HUMAN DEVELOPMENT								
1	Norway	0,957		0,952	0,01		2	-1
2	Ireland	0,955		0,951	0,00		3	-1
2	Switzerland	0,955		0,957	0,00		1	1
4	Hong Kong, China (SAR)	0,949		0,948	0,00		4	0
4	Iceland	0,949		0,942	0,01		8	-4
6	Germany	0,947		0,941	0,01		9	-3
7	Sweden	0,945		0,945	0,00		5	2
8	Australia	0,944		0,938	0,01		12	-4
8	Netherlands	0,944		0,939	0,00		10	-2
10	Denmark	0,940		0,935	0,01		13	-3
11	Finland	0,938		0,938	0,00		11	0
11	Singapore	0,938		0,942	0,00		7	4
13	United Kingdom	0,932		0,926	0,01		15	-2
14	Belgium	0,931		0,926	0,01		16	-2
14	New Zealand	0,931		0,930	0,00		14	0
16	Canada	0,929		0,922	0,01		17	-1
17	United States	0,926		0,920	0,01		19	-2
18	Austria	0,922		0,916	0,01		21	-3
19	Israel	0,919		0,918	0,00		20	-1
19	Japan	0,919		0,909	0,01		24	-5
19	Liechtenstein	0,919		0,943	-0,02		6	13
22	Slovenia	0,917		0,910	0,01		23	-1
23	Korea (Republic of)	0,916		0,921	-0,01		18	5
23	Luxembourg	0,916		0,911	0,00		22	1

25	Spain	0,904		0,897	0,01		26	-1
26	France	0,901		0,895	0,01		27	-1
27	Czechia	0,900		0,900	0,00		25	2
28	Malta	0,895		0,890	0,01		29	-1
29	Estonia	0,892		0,885	0,01		30	-1
29	Italy	0,892		0,884	0,01		31	-2
31	United Arab Emirates	0,890		0,890	0,00		28	3
32	Greece	0,888		0,876	0,01		34	-2
33	Cyprus	0,887		0,878	0,01		32	1
34	Lithuania	0,882		0,875	0,01		35	-1
35	Poland	0,880		0,877	0,00		33	2
36	Andorra	0,868		0,864	0,00		36	0
37	Latvia	0,866		0,857	0,01		38	-1
38	Portugal	0,864		0,857	0,01		39	-1
39	Slovakia	0,860		0,858	0,00		37	2
40	Hungary	0,854		0,848	0,01		42	-2
40	Saudi Arabia	0,854		0,843	0,01		44	-4
42	Bahrain	0,852		0,845	0,01		43	-1
43	Chile	0,851		0,850	0,00		41	2
43	Croatia	0,851		0,841	0,01		46	-3
45	Qatar	0,848		0,854	-0,01		40	5
46	Argentina	0,845		0,837	0,01		47	-1
47	Brunei Darussalam	0,838		0,842	0,00		45	2
48	Montenegro	0,829		0,819	0,01		49	-1
49	Romania	0,828		0,819	0,01		51	-2
50	Palau	0,826		0,820	0,01		48	2
51	Kazakhstan	0,825		0,819	0,01		50	1
52	Russian Federation	0,824		0,817	0,01		52	0
53	Belarus	0,823		0,811	0,01		54	-1
54	Turkey	0,820		0,812	0,01		53	1
55	Uruguay	0,817		0,809	0,01		56	-1
56	Bulgaria	0,816		0,806	0,01		58	-2
57	Panama	0,815		0,801	0,01		61	-4
58	Bahamas	0,814		0,811	0,00		55	3
58	Barbados	0,814		0,777	0,04		68	-10
60	Oman	0,813		0,805	0,01		59	1
61	Georgia	0,812		0,799	0,01		64	-3
62	Costa Rica	0,810		0,798	0,01		62	0
62	Malaysia	0,810		0,808	0,00		57	5
64	Kuwait	0,806		0,802	0,00		60	4
64	Serbia	0,806		0,794	0,01		63	1
66	Mauritius	0,804		0,782	0,02		67	-1
HIGH HUMAN DEVELOPMENT								
67	Seychelles	0,796		0,785	0,01		66	1
67	Trinidad and Tobago	0,796		0,772	0,02		72	-5

69	Albania	0,795	0,787	0,01	65	4
70	Cuba	0,783	0,760	0,02	82	-12
70	Iran (Islamic Republic of)	0,783	0,765	0,02	78	-8
72	Sri Lanka	0,782	0,770	0,01	75	-3
73	Bosnia and Herzegovina	0,780	0,768	0,01	76	-3
74	Grenada	0,779	0,747	0,03	87	-13
74	Mexico	0,779	0,776	0,00	69	5
74	Saint Kitts and Nevis	0,779	0,774	0,01	70	4
74	Ukraine	0,779	0,771	0,01	73	1
78	Antigua and Barbuda	0,778	0,767	0,01	77	1
79	Peru	0,777	0,773	0,00	71	8
79	Thailand	0,777	0,770	0,01	74	5
81	Armenia	0,776	0,760	0,02	81	0
82	North Macedonia	0,774	0,762	0,01	80	2
83	Colombia	0,767	0,763	0,00	79	4
84	Brazil	0,765	0,755	0,01	85	-1
85	China	0,761	0,756	0,01	83	2
86	Ecuador	0,759	0,746	0,01	88	-2
86	Saint Lucia	0,759	0,754	0,01	86	0
88	Azerbaijan	0,756	0,744	0,01	90	-2
88	Dominican Republic	0,756	0,739	0,02	92	-4
90	Moldova (Republic of)	0,750	0,725	0,02	98	-8
91	Algeria	0,748	0,744	0,00	89	2
92	Lebanon	0,744	0,726	0,02	96	-4
93	Fiji	0,743	0,734	0,01	94	-1
94	Dominica	0,742	0,717	0,03	103	-9
95	Maldives	0,740	0,739	0,00	91	4
95	Tunisia	0,740	0,720	0,02	102	-7
97	Saint Vincent and the Grenadines	0,738	0,725	0,01	99	-2
97	Suriname	0,738	0,726	0,01	97	0
99	Mongolia	0,737	0,734	0,00	93	6
100	Botswana	0,735	0,731	0,00	95	5
101	Jamaica	0,734	0,721	0,01	100	1
102	Jordan	0,729	0,708	0,02	106	-4
103	Paraguay	0,728	0,720	0,01	101	2
104	Tonga	0,725	0,698	0,03	110	-6
105	Libya	0,724	0,708	0,02	105	0
106	Uzbekistan	0,720	0,642	0,08	125	-19
107	Bolivia (Plurinational State of)	0,718	0,701	0,02	109	-2
107	Indonesia	0,718	0,710	0,01	104	3
107	Philippines	0,718	0,707	0,01	107	0
110	Belize	0,716	0,690	0,03	115	-5
111	Samoa	0,715	0,694	0,02	113	-2
111	Turkmenistan	0,715	0,695	0,02	112	-1

113	Venezuela (Bolivarian Republic of)	0,711	0,682	0,03	117	-4
114	South Africa	0,709	0,696	0,01	111	3
115	Palestine, State of	0,708	0,640	0,07	126	-11
116	Egypt	0,707	0,683	0,02	116	0
117	Marshall Islands	0,704	0,651	0,05	122	-5
117	Viet Nam	0,704	0,693	0,01	114	3
119	Gabon	0,703	0,703	0,00	108	11
MEDIUM HUMAN DEVELOPMENT						
120	Kyrgyzstan	0,697	0,689	0,01	84	36
121	Morocco	0,686	0,671	0,01	118	3
122	Guyana	0,682	0,664	0,02	119	3
123	Iraq	0,674	0,662	0,01	120	3
124	El Salvador	0,673	0,659	0,01	121	3
125	Tajikistan	0,668	0,635	0,03	129	-4
126	Cabo Verde	0,665	0,629	0,04	130	-4
127	Guatemala	0,663	0,647	0,02	123	4
128	Nicaragua	0,660	0,639	0,02	127	1
129	Bhutan	0,654	0,644	0,01	124	5
130	Namibia	0,646	0,623	0,02	131	-1
131	India	0,645	0,638	0,01	128	3
132	Honduras	0,634	0,617	0,02	132	0
133	Bangladesh	0,632	0,617	0,02	133	0
134	Kiribati	0,630	0,585	0,05	140	-6
135	Sao Tome and Principe	0,625	0,589	0,04	143	-8
136	Micronesia (Federated States of)	0,620	0,605	0,01	136	0
137	Lao People's Democratic Republic	0,613	0,607	0,01	135	2
138	Eswatini (Kingdom of)	0,611	0,605	0,01	137	1
138	Ghana	0,611	0,610	0,00	134	4
140	Vanuatu	0,609	0,519	0,09	164	-24
141	Timor-Leste	0,606	0,565	0,04	145	-4
142	Nepal	0,602	0,585	0,02	139	3
143	Kenya	0,601	0,596	0,01	138	5
144	Cambodia	0,594	0,579	0,02	142	2
145	Equatorial Guinea	0,592	0,580	0,01	141	4
146	Zambia	0,584	0,564	0,02	146	0
147	Myanmar	0,583	0,575	0,01	144	3
148	Angola	0,581	0,562	0,02	147	1
149	Congo	0,574	0,552	0,02	149	0
150	Zimbabwe	0,571	0,544	0,03	153	-3
151	Solomon Islands	0,567	0,538	0,03	155	-4
151	Syrian Arab Republic	0,567	0,537	0,03	150	1
153	Cameroon	0,563	0,544	0,02	152	1
154	Pakistan	0,557	0,535	0,02	156	-2
155	Papua New Guinea	0,555	0,459	0,10	151	4

156	Comoros	0,554		0,523	0,03		161	-5
LOW HUMAN DEVELOPMENT								
157	Mauritania	0,546		0,539	0,01		154	3
158	Benin	0,545		0,534	0,01		157	1
159	Uganda	0,544		0,513	0,03		165	-6
160	Rwanda	0,543		0,520	0,02		163	-3
161	Nigeria	0,539		0,530	0,01		158	3
162	Côte d'Ivoire	0,538		0,529	0,01		159	3
163	Tanzania (United Republic of)	0,529		0,445	0,08		162	1
164	Madagascar	0,528		0,495	0,03		170	-6
165	Lesotho	0,527		0,511	0,02		166	-1
166	Djibouti	0,524		0,509	0,02		167	-1
167	Togo	0,515		0,452	0,06		178	-11
168	Senegal	0,512		0,497	0,01		169	-1
169	Afghanistan	0,511		0,467	0,04		148	21
170	Haiti	0,510		0,476	0,03		173	-3
170	Sudan	0,510		0,489	0,02		171	-1
172	Gambia	0,496		0,393	0,10		168	4
173	Ethiopia	0,485		0,457	0,03		176	-3
174	Malawi	0,483		0,458	0,02		175	-1
175	Congo (Democratic Republic of the)	0,480		0,415	0,07		160	15
175	Guinea-Bissau	0,480		0,464	0,02		174	1
175	Liberia	0,480		0,403	0,08		185	-10
178	Guinea	0,477		0,455	0,02		177	1
179	Yemen	0,470		0,407	0,06		172	7
180	Eritrea	0,459		0,390	0,07		182	-2
181	Mozambique	0,456		0,438	0,02		180	1
182	Burkina Faso	0,452		0,440	0,01		179	3
182	Sierra Leone	0,452		0,413	0,04		184	-2
184	Mali	0,434		0,417	0,02		183	1
185	Burundi	0,433		0,328	0,10		189	-4
185	South Sudan	0,433		0,330	0,10		181	4
187	Chad	0,398		0,385	0,01		186	1
188	Central African Republic	0,397		0,355	0,04		188	0
189	Niger	0,394		0,376	0,02		187	2

Table 6 - HDI & 'Corrected' HDI. Own Elaboration. Data Source: (UNDP, 2020b; World Bank, 2022b)

8.3 Analysis of the results

From the table above it is possible to appreciate how many countries have gained or lost positions in the ranking although this is not remarkable in absolute terms. What is more important is the general distribution of the 'corrected' index values:

HDI Value	HDI - Average	Corrected HDI - Average	Δ
Very High Human Development	0.879	0.873	0.006
High Human Development	0.747	0.731	0.016
Medium Human Development	0.618	0.594	0.024
Low Human Development	0.487	0.449	0.038

Table 7 - Loss of HDI, Comparison. Own Elaboration. Data source:(UNDP, 2020b; World Bank, 2022b)

The if the general reduction of the ‘corrected’ HDI is understandable as GNI Index is lower than the ‘original’ one because of the lower disposable per capita income. It is interesting to note how the reduction is bigger for Low Human Development Countries than for Very High Human Development ones (0.006 vs 0.038). also interesting is the fact that the loss is proportionally increasing at the HDI decrease.

So, in the end, what can be deduced from the data above is that there is a polarization between high HDI countries and low ones. This polarization then shows how the situation in ‘developed countries’ allows inhabitants an even higher level of potential well-being than ‘poor’ and ‘developing’ ones.

In terms of capabilities, in fact, the higher available income (or its equivalent cost-opportunity choice) is proportionally more in high HDI than in low ones. The thing is quite surprising as one would argue that the cost of living is higher in ‘rich’ countries than in ‘poorer’ ones and therefore the available income could be less once housing, transport, and food are taken off the equation. This might be even more true as housing and transport are considered to be more relevant in the ‘developed’ world than in the ‘south’ (always proportionally speaking). Although, this paper seems to demonstrate that this is not so and that the trade-off between subsistence living, and freedom is proportionally higher in low HDI countries than classical HDI could tackle.

Moreover, more reliable data can be detected in High HDI countries than in low ones and this may lead to underestimation of the problem of subsistence cost of living in ‘developing’ countries (this problem though may be true also for every other component of HDI).

The new HDI Rank would therefore be:

Country	Rank
Switzerland	1
Norway	2
Ireland	3
Hong Kong, China (SAR)	4
Sweden	5
Liechtenstein	6
Singapore	7
Iceland	8
Germany	9
Netherlands	10
Finland	11
Australia	12
Denmark	13
New Zealand	14
United Kingdom	15
Belgium	16
Canada	17
Korea (Republic of)	18
United States	19
Israel	20
Austria	21
Luxembourg	22
Slovenia	23
Japan	24
Czechia	25
Spain	26
France	27
United Arab Emirates	28
Malta	29
Estonia	30
Italy	31
Cyprus	32
Poland	33
Greece	34
Lithuania	35
Andorra	36
Slovakia	37

Latvia	38
Portugal	39
Qatar	40
Chile	41
Hungary	42
Bahrain	43
Saudi Arabia	44
Brunei Darussalam	45
Croatia	46
Argentina	47
Palau	48
Montenegro	49
Kazakhstan	50
Romania	51
Russian Federation	52
Turkey	53
Belarus	54
Bahamas	55
Uruguay	56
Malaysia	57
Bulgaria	58
Oman	59
Kuwait	60
Panama	61
Costa Rica	62
Serbia	63
Georgia	64
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Table 8 - Corrected HDI Countries' Rank. Own Elaboration.

9. Conclusions

The 'corrected' HDI results detailed in the previous chapter show some significant consequences and possible implications:

- They can be used to better compare well-being standards between countries despite their income level or HDI ranking. Italy, for instance, loses two positions vis a vis Czechia with a proportionally more significant loss of HDI. This 'exchange' can be interpreted as a suitable policy parameter regarding social well-being between the countries involved;
- The increase of polarization between high and low HDI countries may better tackle the real difference in living standard conditions and capabilities on the ground;
- The reasoning behind the modification proposed is quite simple. It might help in understanding the actual situation of the available income to freely satisfy personal ambitions (despite political implications that might, of course, limit this) without adding significant complexity to calculations.

On the other hand, the 'corrected' composite index has some criticalities. The homogeneity of data is not guaranteed, and some data were missing at all. When this happened, the best possible approximation had to be found. Although, if it could be found a joint agreement on the methodology to calculate this corrected HDI data could be easily collected and homogenized as already part of GDP and GNP composition. Moreover, this problem already affects classical HDI, as seen before. Despite this, this corrected HDI could already serve as a good proxy of precise and uniform data.

Moreover, with regards to the critiques of poor data, we have dealt in previous chapters, the conclusion for the corrected HDI does not differ from the ones to the classic index: UNDP is aware since the first HDR that data collection shall be improved at a national level and

encouraged countries to improve. On the other hand, national accounts are often not reliable, so GNP deriving from them could be said to have the same problem. Therefore, this critique appears to be, again, specious.

Let us now see what other critiques might arise against the 'Good Policy Index':

- **Wrong indicators:** respect the classical version of HDI; the only difference here is about the Income Index and whether to accept to consider the available income for personal aspirations. It is reckoned that this approach is a better proxy of capability (in Sen's definition) satisfaction could be better tackled once survival expenditures are taken off the equation. So, this critique is not corrected from the start. On the other hand, it could be interesting to open some discussion on the best way to target the available income free from subsistence expenditures.
- **Wrong Specification:** The 'corrected' HDI keeps a high degree of arbitrariness as HDI, but this does not limit the accuracy of its results in being a good proxy for allowing the general public and policymakers to understand the level of a country's Human Development. It is true that in the 'corrected' HDI, the arbitrariness level might somehow be considered higher since it involves the decision of what goods to exclude from the Y-Index, but once again, the decision is based on solid and scientific grounds and without adding any significant level of complexity.
- **Redundancy:** it could be said that the divergences of the 'corrected' HDI from the 'classic' one are small, so there is no need for it. This critique, though, seems specious as if the corrections allow to target a condition better refining a model (which by definition is a simplified picture of the reality), without adding any level of complexity, it would be pointless not using it.

Therefore, the 'corrected' HDI appears to be a better proxy despite its limits and seems to be a good discussion base for future development. Hopefully, the HDI as Good Policy Index might serve as a ground for future discussion and improvement on the topic.

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Annex I: Table Calculations for the 'corrected' HDI

Back Table 1. Human Development Index and its components														
			SDG3	SDG4.3	SDG4.4	SDG8.5								
		Human Development Index (HDI)	Life expectancy at birth	Expected years of schooling	Mean years of schooling	Gross national income (GNI) per capita	GNI per capita rank minus HDI rank	HDI rank	Corrected Human Development Index (HDI)	Δ	Corrected HDI rank	Δ		
HDI rank	Country	Value	(years)	(years)	(years)	(2017 PPP \$)								
		2019	2019	2019	^a 2019	^a 2019	2019	2019	2018					
VERY HIGH HUMAN DEVELOPMENT														
1	Norway	0,957	82,4	18,1	^b 12,9	66.494	7	1	0,952	0,01	2	-1		
2	Ireland	0,955	82,3	18,7	^b 12,7	68.371	4	3	0,951	0,00	3	-1		
2	Switzerland	0,955	83,8	16,3	13,4	69.394	3	2	0,957	0,00	1	1		
4	Hong Kong, China (SAR)	0,949	84,9	16,9	12,3	62.985	7	4	0,948	0,00	4	0		
4	Iceland	0,949	83,0	19,1	^b 12,8	^c 54.682	14	4	0,942	0,01	8	-4		
6	Germany	0,947	81,3	17,0	14,2	55.314	11	4	0,941	0,01	9	-3		
7	Sweden	0,945	82,8	19,5	^b 12,5	54.508	12	7	0,945	0,00	5	2		
8	Australia	0,944	83,4	22,0	^b 12,7	^c 48.085	15	7	0,938	0,01	12	-4		
8	Netherlands	0,944	82,3	18,5	^b 12,4	57.707	6	9	0,939	0,00	10	-2		
10	Denmark	0,940	80,9	18,9	^b 12,6	^c 58.662	2	10	0,935	0,01	13	-3		
11	Finland	0,938	81,9	19,4	^b 12,8	48.511	11	11	0,938	0,00	11	0		

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11	Singapore	0,938	83,6	16,4	11,6		88.155	^d	-8	12	0,942	0,0 0	7	4
13	United Kingdom	0,932	81,3	17,5	13,2		46.071		13	14	0,926	0,0 1	15	-2
14	Belgium	0,931	81,6	19,8	^b 12,1	^e	52.085		6	13	0,926	0,0 1	16	-2
14	New Zealand	0,931	82,3	18,8	^b 12,8	^c	40.799		18	14	0,930	0,0 0	14	0
16	Canada	0,929	82,4	16,2	13,4	^c	48.527		5	14	0,922	0,0 1	17	-1
17	United States	0,926	78,9	16,3	13,4		63.826		-7	17	0,920	0,0 1	19	-2
18	Austria	0,922	81,5	16,1	12,5	^c	56.197		-3	18	0,916	0,0 1	21	-3
19	Israel	0,919	83,0	16,2	13,0		40.187		14	21	0,918	0,0 0	20	-1
19	Japan	0,919	84,6	15,2	12,9	^f	42.932		9	20	0,909	0,0 1	24	-5
19	Liechtenstein	0,919	80,7	^g 14,9	12,5	^h	131.032	^d ⁱ	-18	19	0,943	- 0,0 2	6	13
22	Slovenia	0,917	81,3	17,6	12,7		38.080		15	24	0,910	0,0 1	23	-1
23	Korea (Republic of)	0,916	83,0	16,5	12,2		43.044		4	22	0,921	- 0,0 1	18	5
23	Luxembourg	0,916	82,3	14,3	12,3	^e	72.712		-19	23	0,911	0,0 0	22	1
25	Spain	0,904	83,6	17,6	10,3		40.975		6	25	0,897	0,0 1	26	-1
26	France	0,901	82,7	15,6	11,5		47.173		-1	26	0,895	0,0 1	27	-1
27	Czechia	0,900	79,4	16,8	12,7	^c	38.109		9	26	0,900	0,0 0	25	2
28	Malta	0,895	82,5	16,1	11,3		39.555		6	28	0,890	0,0 1	29	-1
29	Estonia	0,892	78,8	16,0	13,1	^c	36.019		9	30	0,885	0,0 1	30	-1
29	Italy	0,892	83,5	16,1	10,4	^j	42.776		0	29	0,884	0,0 1	31	-2
31	United Arab Emirates	0,890	78,0	14,3	12,1		67.462		-24	30	0,890	0,0 0	28	3
32	Greece	0,888	82,2	17,9	10,6		30.155		14	33	0,876	0,0 1	34	-2
33	Cyprus	0,887	81,0	15,2	12,2		38.207		2	32	0,878	0,0 1	32	1
34	Lithuania	0,882	75,9	16,6	13,1		35.799		5	35	0,875	0,0 1	35	-1
35	Poland	0,880	78,7	16,3	12,5	^e	31.623		8	34	0,877	0,0 0	33	2

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36	Andorra	0,868	81,9	^g	13,3	^k	10,5		56.000	^l	-20	36	0,864	0,0 0	36	0
37	Latvia	0,866	75,3		16,2		13,0	^c	30.282		8	37	0,857	0,0 1	38	-1
38	Portugal	0,864	82,1		16,5		9,3		33.967		2	38	0,857	0,0 1	39	-1
39	Slovakia	0,860	77,5		14,5		12,7	^c	32.113		3	39	0,858	0,0 0	37	2
40	Hungary	0,854	76,9		15,2		12,0		31.329		4	42	0,848	0,0 1	42	-2
40	Saudi Arabia	0,854	75,1		16,1		10,2		47.495		-16	40	0,843	0,0 1	44	-4
42	Bahrain	0,852	77,3		16,3		9,5		42.522		-12	41	0,845	0,0 1	43	-1
43	Chile	0,851	80,2		16,4		10,6		23.261		16	43	0,850	0,0 0	41	2
43	Croatia	0,851	78,5		15,2		11,4	^e	28.070		6	44	0,841	0,0 1	46	-3
45	Qatar	0,848	80,2		12,0		9,7		92.418	^d	-43	45	0,854	- 0,0 1	40	5
46	Argentina	0,845	76,7		17,7		10,9	^c	21.190		16	46	0,837	0,0 1	47	-1
47	Brunei Darussalam	0,838	75,9		14,3		9,1	^f	63.965		-38	47	0,842	0,0 0	45	2
48	Montenegro	0,829	76,9		15,0		11,6	^m	21.399		13	48	0,819	0,0 1	49	-1
49	Romania	0,828	76,1		14,3		11,1		29.497		-1	49	0,819	0,0 1	51	-2
50	Palau	0,826	73,9	^g	15,8	^j	12,5	^j	19.317		15	52	0,820	0,0 1	48	2
51	Kazakhstan	0,825	73,6		15,6		11,9	^j	22.857		9	53	0,819	0,0 1	50	1
52	Russian Federation	0,824	72,6		15,0		12,2	^j	26.157		2	49	0,817	0,0 1	52	0
53	Belarus	0,823	74,8		15,4		12,3	^m	18.546		14	49	0,811	0,0 1	54	-1
54	Turkey	0,820	77,7		16,6	^c	8,1		27.701		-4	54	0,812	0,0 1	53	1
55	Uruguay	0,817	77,9		16,8		8,9		20.064		9	56	0,809	0,0 1	56	-1
56	Bulgaria	0,816	75,1		14,4		11,4		23.325		2	55	0,806	0,0 1	58	-2
57	Panama	0,815	78,5		12,9		10,2	^f	29.558		-10	58	0,801	0,0 1	61	-4
58	Bahamas	0,814	73,9		12,9	ⁿ	11,4	^j	33.747		-17	58	0,811	0,0 0	55	3
58	Barbados	0,814	79,2		15,4		10,6	^o	14.936		20	60	0,777	0,0 4	68	-10

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60	Oman	0,813		77,9		14,2		9,7	j	25.944		-5		56		0,805	0,0 1	59	1
61	Georgia	0,812		73,8		15,3		13,1		14.429		22		63		0,799	0,0 1	64	-3
62	Costa Rica	0,810		80,3		15,7		8,7		18.486		6		61		0,798	0,0 1	62	0
62	Malaysia	0,810		76,2		13,7		10,4		27.534		-11		63		0,808	0,0 0	57	5
64	Kuwait	0,806		75,5		14,2		7,3		58.590		-51		62		0,802	0,0 0	60	4
64	Serbia	0,806		76,0		14,7		11,2		17.192		8		65		0,794	0,0 1	63	1
66	Mauritius	0,804		75,0		15,1		9,5	f	25.266		-10		66		0,782	0,0 2	67	-1
																	0,0 0		
67	Seychelles	0,796		73,4		14,1		10,0	k	26.903		-15		69		0,785	0,0 1	66	1
67	Trinidad and Tobago	0,796		73,5		13,0	j	11,0	f	26.231		-14		67		0,772	0,0 2	72	-5
69	Albania	0,795		78,6		14,7		10,1	p	13.998		18		68		0,787	0,0 1	65	4
70	Cuba	0,783		78,8		14,3		11,8	j	8.621	q	45		71		0,760	0,0 2	82	-12
70	Iran (Islamic Republic of)	0,783		76,7		14,8		10,3		12.447		26		70		0,765	0,0 2	78	-8
72	Sri Lanka	0,782		77,0		14,1		10,6		12.707		23		73		0,770	0,0 1	75	-3
73	Bosnia and Herzegovina	0,780		77,4		13,8	k	9,8		14.872		7		76		0,768	0,0 1	76	-3
74	Grenada	0,779		72,4		16,9		9,0	n	15.641		3		74		0,747	0,0 3	87	-13
74	Mexico	0,779		75,1		14,8		8,8		19.160		-8		76		0,776	0,0 0	69	5
74	Saint Kitts and Nevis	0,779		74,8	g	13,8	j	8,7	n	25.038		-17		75		0,774	0,0 1	70	4
74	Ukraine	0,779		72,1		15,1	j	11,4	o	13.216		19		78		0,771	0,0 1	73	1
78	Antigua and Barbuda	0,778		77,0		12,8	j	9,3	k	20.895		-15		80		0,767	0,0 1	77	1
79	Peru	0,777		76,7		15,0		9,7		12.252		19		78		0,773	0,0 0	71	8
79	Thailand	0,777		77,2		15,0	j	7,9		17.781		-10		80		0,770	0,0 1	74	5
81	Armenia	0,776		75,1		13,1		11,3		13.894		9		72		0,760	0,0 2	81	0
82	North Macedonia	0,774		75,8		13,6		9,8	m	15.865		-7		82		0,762	0,0 1	80	2
83	Colombia	0,767		77,3		14,4		8,5		14.257		3		83		0,763	0,0 0	79	4

84	Brazil	0,765	75,9	15,4		8,0		14.263	1	84	0,755	0,0 1	85	-1
85	China	0,761	76,9	14,0	j	8,1	f	16.057	-11	87	0,756	0,0 1	83	2
86	Ecuador	0,759	77,0	14,6	j	8,9		11.044	19	84	0,746	0,0 1	88	-2
86	Saint Lucia	0,759	76,2	14,0	j	8,5	j	14.616	-4	86	0,754	0,0 1	86	0
88	Azerbaijan	0,756	73,0	12,9	j	10,6		13.784	3	88	0,744	0,0 1	90	-2
88	Dominican Republic	0,756	74,1	14,2		8,1	j	17.591	-18	89	0,739	0,0 2	92	-4
90	Moldova (Republic of)	0,750	71,9	11,5		11,7		13.664	2	91	0,725	0,0 2	98	-8
91	Algeria	0,748	76,9	14,6		8,0	m	11.174	13	91	0,744	0,0 0	89	2
92	Lebanon	0,744	78,9	11,3		8,7	n	14.655	-11	90	0,726	0,0 2	96	-4
93	Fiji	0,743	67,4	14,4	n	10,9		13.009	1	93	0,734	0,0 1	94	-1
94	Dominica	0,742	78,2	13,0	p	8,1	k	11.884	7	94	0,717	0,0 3	103	-9
95	Maldives	0,740	78,9	12,2	p	7,0	p	17.417	-24	98	0,739	0,0 0	91	4
95	Tunisia	0,740	76,7	15,1		7,2		10.414	14	94	0,720	0,0 2	102	-7
97	Saint Vincent and the Grenadines	0,738	72,5	14,1	j	8,8	j	12.378	0	96	0,725	0,0 1	99	-2
97	Suriname	0,738	71,7	13,2		9,3	m	14.324	-13	98	0,726	0,0 1	97	0
99	Mongolia	0,737	69,9	14,2	j	10,3	m	10.839	7	97	0,734	0,0 0	93	6
100	Botswana	0,735	69,6	12,8	j	9,6	o	16.437	-27	102	0,731	0,0 0	95	5
101	Jamaica	0,734	74,5	13,1	j	9,7	j	9.319	13	98	0,721	0,0 1	100	1
102	Jordan	0,729	74,5	11,4	p	10,5	f	9.858	8	103	0,708	0,0 2	106	-4
103	Paraguay	0,728	74,3	12,7	m	8,5		12.224	-4	104	0,720	0,0 1	101	2
104	Tonga	0,725	70,9	14,4	j	11,2	f	6.365	25	105	0,698	0,0 3	110	-6
105	Libya	0,724	72,9	12,9	n	7,6	o	15.688	-29	106	0,708	0,0 2	105	0
106	Uzbekistan	0,720	71,7	12,1		11,8		7.142	17	107	0,642	0,0 8	125	-19
107	Bolivia (Plurinational State of)	0,718	71,5	14,2	r	9,0		8.554	9	108	0,701	0,0 2	109	-2
107	Indonesia	0,718	71,7	13,6		8,2		11.459	-4	110	0,710	0,0 1	104	3

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107	Philippines	0,718	71,2	13,1	9,4	9.778	4	111	0,707	0,01	107	0			
110	Belize	0,716	74,6	13,1	9,9	6.382	m	18	108	0,690	0,03	115	-5		
111	Samoa	0,715	73,3	12,7	j	10,8	6.309	19	113	0,694	0,02	113	-2		
111	Turkmenistan	0,715	68,2	11,2	j	10,3	m	14.909	-32	112	0,695	0,02	112	-1	
113	Venezuela (Bolivarian Republic of)	0,711	72,1	12,8	j	10,3	7.045	s	11	101	0,682	0,03	117	-4	
114	South Africa	0,709	64,1	13,8	10,2	12.129	-14	115	0,696	0,01	111	3			
115	Palestine, State of	0,708	74,1	13,4	9,2	6.417	12	114	0,640	0,07	126	-11			
116	Egypt	0,707	72,0	13,3	7,4	f	11.466	-14	117	0,683	0,02	116	0		
117	Marshall Islands	0,704	74,1	g	12,4	n	10,9	j	5.039	21	116	0,651	0,05	122	-5
117	Viet Nam	0,704	75,4	12,7	j	8,3	f	7.433	3	118	0,693	0,01	114	3	
119	Gabon	0,703	66,5	13,0	n	8,7	f	13.930	-30	119	0,703	0,00	108	11	
											0,00				
120	Kyrgyzstan	0,697	71,5	13,0	11,1	m	4.864	23	120	0,689	0,01	84	36		
121	Morocco	0,686	76,7	13,7	5,6	f	7.368	1	121	0,671	0,01	118	3		
122	Guyana	0,682	69,9	11,4	j	8,5	m	9.455	-10	121	0,664	0,02	119	3	
123	Iraq	0,674	70,6	11,3	m	7,3	j	10.801	-16	123	0,662	0,01	120	3	
124	El Salvador	0,673	73,3	11,7	6,9	8.359	-6	124	0,659	0,01	121	3			
125	Tajikistan	0,668	71,1	11,7	j	10,7	p	3.954	25	126	0,635	0,03	129	-4	
126	Cabo Verde	0,665	73,0	12,7	6,3	j	7.019	-1	125	0,629	0,04	130	-4		
127	Guatemala	0,663	74,3	10,8	6,6	8.494	-10	128	0,647	0,02	123	4			
128	Nicaragua	0,660	74,5	12,3	r	6,9	f	5.284	6	127	0,639	0,02	127	1	
129	Bhutan	0,654	71,8	13,0	4,1	10.746	-21	131	0,644	0,01	124	5			
130	Namibia	0,646	63,7	12,6	j	7,0	f	9.357	-17	129	0,623	0,02	131	-1	
131	India	0,645	69,7	12,2	6,5	j	6.681	-5	130	0,638	0,01	128	3		
132	Honduras	0,634	75,3	10,1	6,6	5.308	1	132	0,617	0,02	132	0			

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133	Bangladesh	0,632	72,6	11,6		6,2		4.976	7	134	0,617	0,0 2	133	0
134	Kiribati	0,630	68,4	11,8	m	8,0	m	4.260	12	133	0,585	0,0 5	140	-6
135	Sao Tome and Principe	0,625	70,4	12,7	j	6,4	j	3.952	16	135	0,589	0,0 4	143	-8
136	Micronesia (Federated States of)	0,620	67,9	11,5	k	7,8	n	3.983	13	136	0,605	0,0 1	136	0
137	Lao People's Democratic Republic	0,613	67,9	11,0		5,3	f	7.413	-16	137	0,607	0,0 1	135	2
138	Eswatini (Kingdom of)	0,611	60,2	11,8	j	6,9	m	7.919	-19	139	0,605	0,0 1	137	1
138	Ghana	0,611	64,1	11,5		7,3	f	5.269	-3	138	0,610	0,0 0	134	4
140	Vanuatu	0,609	70,5	11,7	n	7,1		3.105	20	140	0,519	0,0 9	164	-24
141	Timor-Leste	0,606	69,5	12,6	j	4,8	p	4.440	3	141	0,565	0,0 4	145	-4
142	Nepal	0,602	70,8	12,8		5,0	f	3.457	13	143	0,585	0,0 2	139	3
143	Kenya	0,601	66,7	11,3	p	6,6	f	4.244	5	141	0,596	0,0 1	138	5
144	Cambodia	0,594	69,8	11,5	p	5,0	f	4.246	3	144	0,579	0,0 2	142	2
145	Equatorial Guinea	0,592	58,7	9,7	n	5,9	k	13.944	-57	145	0,580	0,0 1	141	4
146	Zambia	0,584	63,9	11,5	p	7,2	p	3.326	10	145	0,564	0,0 2	146	0
147	Myanmar	0,583	67,1	10,7		5,0	p	4.961	-6	148	0,575	0,0 1	144	3
148	Angola	0,581	61,2	11,8	p	5,2	p	6.104	-17	145	0,562	0,0 2	147	1
149	Congo	0,574	64,6	11,7	n	6,5	o	2.879	13	149	0,552	0,0 2	149	0
150	Zimbabwe	0,571	61,5	11,0	m	8,5		2.666	14	150	0,544	0,0 3	153	-3
151	Solomon Islands	0,567	73,0	10,2	j	5,7	m	2.253	17	151	0,538	0,0 3	155	-4
151	Syrian Arab Republic	0,567	72,7	8,9	j	5,1	n	3.613	t	2	0,537	0,0 3	150	1
153	Cameroon	0,563	59,3	12,1		6,3	m	3.581	1	153	0,544	0,0 2	152	1
154	Pakistan	0,557	67,3	8,3		5,2		5.005	-15	154	0,535	0,0 2	156	-2
155	Papua New Guinea	0,555	64,5	10,2	p	4,7	f	4.301	-10	156	0,459	0,1 0	151	4
156	Comoros	0,554	64,3	11,2		5,1	n	3.099	5	154	0,523	0,0 3	161	-5
												0,0 0		

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157	Mauritania	0,546	64,9	8,6	4,7	f	5.135	-21	157	0,539	0,0 1	154	3
158	Benin	0,545	61,8	12,6	3,8	p	3.254	0	158	0,534	0,0 1	157	1
159	Uganda	0,544	63,4	11,4	6,2	p	2.123	15	160	0,513	0,0 3	165	-6
160	Rwanda	0,543	69,0	11,2	4,4	j	2.155	12	159	0,520	0,0 2	163	-3
161	Nigeria	0,539	54,7	10,0	6,7	p	4.910	-19	161	0,530	0,0 1	158	3
162	Côte d'Ivoire	0,538	57,8	10,0	5,3	f	5.069	-25	161	0,529	0,0 1	159	3
163	Tanzania (United Republic of)	0,529	65,5	8,1	6,1	f	2.600	2	164	0,445	0,0 8	162	1
164	Madagascar	0,528	67,0	10,2	6,1	n	1.596	16	163	0,495	0,0 3	170	-6
165	Lesotho	0,527	54,3	11,3	6,5	j	3.151	-6	165	0,511	0,0 2	166	-1
166	Djibouti	0,524	67,1	6,8	4,1	n	5.689	-34	166	0,509	0,0 2	167	-1
167	Togo	0,515	61,0	12,7	4,9	m	1.602	12	168	0,452	0,0 6	178	-11
168	Senegal	0,512	67,9	8,6	3,2	j	3.309	-11	167	0,497	0,0 1	169	-1
169	Afghanistan	0,511	64,8	10,2	3,9	f	2.229	0	169	0,467	0,0 4	148	21
170	Haiti	0,510	64,0	9,7	5,6	p	1.709	7	170	0,476	0,0 3	173	-3
170	Sudan	0,510	65,3	7,9	3,8	f	3.829	-18	171	0,489	0,0 2	171	-1
172	Gambia	0,496	62,1	9,9	3,9	m	2.168	-1	172	0,393	0,1 0	168	4
173	Ethiopia	0,485	66,6	8,8	2,9	p	2.207	-3	174	0,457	0,0 3	176	-3
174	Malawi	0,483	64,3	11,2	4,7	f	1.035	13	174	0,458	0,0 2	175	-1
175	Congo (Democratic Republic of the)	0,480	60,7	9,7	6,8	j	1.063	11	174	0,415	0,0 7	160	15
175	Guinea-Bissau	0,480	58,3	10,6	3,6	m	1.996	1	178	0,464	0,0 2	174	1
175	Liberia	0,480	64,1	9,6	4,8	n	1.258	8	173	0,403	0,0 8	185	-10
178	Guinea	0,477	61,6	9,4	2,8	m p	2.405	-12	177	0,455	0,0 2	177	1
179	Yemen	0,470	66,1	8,8	3,2	f	1.594	2	179	0,407	0,0 6	172	7
180	Eritrea	0,459	66,3	5,0	3,9	n	2.793	-17	180	0,390	0,0 7	182	-2
181	Mozambique	0,456	60,9	10,0	3,5	j	1.250	3	181	0,438	0,0 2	180	1

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182	Burkina Faso	0,452	61,6	9,3	1,6	^p	2.133	-9	183	0,440	0,0 1	179	3
182	Sierra Leone	0,452	54,7	10,2	3,7	^f	1.668	-4	182	0,413	0,0 4	184	-2
184	Mali	0,434	59,3	7,5	2,4	^m	2.269	-17	184	0,417	0,0 2	183	1
185	Burundi	0,433	61,6	11,1	3,3	^p	754	4	184	0,328	0,1 0	189	-4
185	South Sudan	0,433	57,9	5,3	4,8	ⁿ	2.003	^u -10	186	0,330	0,1 0	181	4
187	Chad	0,398	54,2	7,3	2,5	^p	1.555	-5	187	0,385	0,0 1	186	1
188	Central African Republic	0,397	53,3	7,6	4,3	^f	993	0	188	0,355	0,0 4	188	0
189	Niger	0,394	62,4	6,5	2,1	^j	1.201	-4	189	0,376	0,0 2	187	2
	Korea (Democratic People's Rep. of)	..	72,3	10,8	..	^j	..	..	..	
	Monaco	..	..	..	..		..	..	..
	Nauru	..	..	11,2	..	^j	16.237	..	..		
	San Marino	..	..	13,0	..		..	..	..
	Somalia	..	57,4	..	..		..	..	..
	Tuvalu	..	..	12,3	..	^j	6.132	..	..		
	Human development groups												
	Very high human development	0,898	79,6	16,3	12,2		44.566	—	—				
	High human development	0,753	75,3	14,0	8,4		14.255	—	—				
	Medium human development	0,631	69,3	11,5	6,3		6.153	—	—				
	Low human development	0,513	61,4	9,4	4,9		2.745	—	—				
	Developing countries	0,689	71,3	12,2	7,5		10.583	—	—				
	Regions												
	Arab States	0,705	72,1	12,1	7,3		14.869	—	—				
	East Asia and the Pacific	0,747	75,4	13,6	8,1		14.710	—	—				
	Europe and Central Asia	0,791	74,4	14,7	10,4		17.939	—	—				

Latin America and the Caribbean	0,766	75,6	14,6	8,7	14.812	—	—												
South Asia	0,641	69,9	11,7	6,5	6.532	—	—												
Sub-Saharan Africa	0,547	61,5	10,1	5,8	3.686	—	—												
Least developed countries	0,538	65,3	9,9	4,9	2.935	—	—												
Small island developing states	0,728	72,0	12,3	8,7	16.825	—	—												
Organisation for Economic Co-operation and Development	0,900	80,4	16,3	12,0	44.967	—	—												
World	0,737	72,8	12,7	8,5	16.734	—	—												
Notes																			
a. Data refer to 2019 or the most recent year available.																			
b. In calculating the HDI value, expected years of schooling is capped at 18 years.																			
c. Based on data from OECD (2019b).																			
d. In calculating the HDI value, GNI per capita is capped at \$75,000.																			
e. Updated by HDRO based on data from Eurostat (2019).																			
f. Based on projections from Barro and Lee (2018).																			
g. Value from UNDESA (2011).																			
h. Imputed mean years of schooling for Austria.																			
i. Estimated using the purchasing power parity (PPP) rate and projected growth rate of Switzerland.																			
j. Updated by HDRO based on data from UNESCO Institute for Statistics (2020)																			
k. Based on data from the national statistical office.																			
l. Estimated using the PPP rate and projected growth rate of Spain.																			
m. Updated by HDRO based on data from United Nations Children’s Fund (UNICEF) Multiple Indicator Cluster Surveys for 2006–2019.																			
n. Based on cross-country regression.																			
o. Updated by HDRO using projections from Barro and Lee (2018).																			

Annex II: Table for calculation of GNP-Subsistence Cost

	Country	GNI Per Capita	Diet	Housing	Transport	Missing data	Regional Average Diet	Regional Average Housing	Regional Average Transport	GNI-Subsistence
1	Norway	66.494	1,12	5464,64	628,03					\$ 59.992,06
2	Ireland	68.371	0,57	4279,39	604,95					\$ 63.278,93
2	Switzerland	69.394	0,42	6610,72	626,60					\$ 62.003,63
4	Hong Kong, China (SAR)	62.985	#N/D	#N/D	#N/D	x y z	0,804		241,86	\$ 61.564,87
4	Iceland	54.682	0,38	6466,34	358,27			884,58		\$ 47.719,81
6	Germany	55.314	0,26	5566,21	374,16					\$ 49.278,35
7	Sweden	54.508	0,80	6161,69	471,57					\$ 47.582,54
8	Australia	48.085	0,31	4837,10	644,19					\$ 42.491,49
8	Netherlands	57.707	0,30	4961,36	302,08					\$ 52.335,23
10	Denmark	58.662	0,30	5598,02	225,79					\$ 52.728,56
11	Finland	48.511	0,28	5864,98	361,22					\$ 42.183,00
11	Singapore	88.155	0,75	4882,54	1591,57					\$ 81.406,99
13	United Kingdom	46.071	0,26	4799,72	577,43					\$ 40.597,50
14	Belgium	52.085	0,26	5239,83	203,02					\$ 46.545,74
14	New Zealand	40.799	0,49	4488,81	780,53					\$ 35.350,90
16	Canada	48.527	0,67	5962,92	311,08					\$ 42.007,40
17	United States	63.826	0,91	7629,04	466,23					\$ 55.400,06
18	Austria	56.197	0,35	6269,70	438,78					\$ 49.362,13
19	Israel	40.187	0,50	4126,40	1220,42					\$ 34.656,44
19	Japan	42.932	2,96	5505,06	523,55					\$ 35.823,42
19	Liechtenstein	131.032	#N/D	#N/D	#N/D	x y z	0,545		417,77	\$ 125.946,51
22	Slovenia	38.080	0,43	4170,72	119,78			4.468,38		\$ 33.630,62
23	Korea (Republic of)	43.044	#N/D	#N/D	#N/D	x y z	0,804		241,86	\$ 41.623,82
23	Luxembourg	72.712	0,34	6439,90	272,79			884,58		\$ 65.876,70
25	Spain	40.975	0,44	4694,33	341,84					\$ 35.778,48
26	France	47.173	0,32	5665,68	395,22					\$ 40.996,66

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27	Czechia	38.109	#N/D	#N/D	#N/D	x y z	0,545	4.468,38	417,77	\$ 33.023,49
28	Malta	39.555	0,74	3287,43	480,18					\$ 35.516,45
29	Estonia	36.019	0,42	3676,08	330,40					\$ 31.860,22
29	Italy	42.776	0,31	5750,40	435,81					\$ 36.476,27
31	United Arab Emirates	67.462	0,75	8167,08	270,91					\$ 58.751,82
32	Greece	30.155	0,67	4994,68	890,59					\$ 24.024,08
33	Cyprus	38.207	0,58	4981,28	533,74					\$ 32.481,21
34	Lithuania	35.799	0,51	4455,26	223,33					\$ 30.935,76
35	Poland	31.623	0,39	5195,11	156,00					\$ 26.129,09
36	Andorra	56.000	#N/D	#N/D	#N/D	x y z	0,545	4.468,38	417,77	\$ 50.915,23
37	Latvia	30.282	0,44	4045,21	341,39					\$ 25.734,46
38	Portugal	33.967	0,41	4039,61	237,42					\$ 29.539,41
39	Slovakia	32.113	#N/D	4598,80	236,95	x	0,545	4.468,38	417,77	\$ 27.078,37
40	Hungary	31.329	0,43	3713,40	161,38					\$ 27.295,61
40	Saudi Arabia	47.495	0,88	9627,33	148,56					\$ 37.397,24
42	Bahrain	42.522	0,79	5690,29	260,80					\$ 36.281,54
43	Chile	23.261	0,64	2007,15	783,73					\$ 20.235,35
43	Croatia	28.070	0,66	4557,80	228,58					\$ 23.041,48
45	Qatar	92.418	0,60	5121,83	1960,38					\$ 85.116,29
46	Argentina	21.190	0,65	1899,18	737,57					\$ 18.315,44
47	Brunei Darussalam	63.965	0,76	3737,55	210,02					\$ 59.739,39
48	Montenegro	21.399	0,55	3209,74	165,59					\$ 17.822,80
49	Romania	29.497	0,49	4313,95	360,94					\$ 24.643,86
50	Palau	19.317	#N/D	..	..	x y z	0,973	1.733,40	178,95	\$ 17.049,47
51	Kazakhstan	22.857	0,65	3222,86	1327,62					\$ 18.068,64
52	Russian Federation	26.157	0,61	3074,82	353,11					\$ 22.507,92
53	Belarus	18.546	0,80	2975,38	323,28					\$ 14.955,83
54	Turkey	27.701	#N/D	5742,64	775,07		0,737	3.781,65	349,24	\$ 23.301,00

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55	Uruguay	20.064	0,69	4227,90	383,24					\$ 15.199,19
56	Bulgaria	23.325	0,50	3669,66	421,30					\$ 19.049,73
57	Panama	29.558	1,13	5380,77	1422,78					\$ 22.342,40
58	Bahamas	33.747	#N/D	#N/D	#N/D	x y z	0,973	1.733,40	178,95	\$ 31.479,71
58	Barbados	14.936	0,90	7042,81	448,92					\$ 7.117,14
60	Oman	25.944	0,52	3482,22	163,71					\$ 22.107,61
61	Georgia	14.429	#N/D	2542,20	289,41	x	0,545	4.468,38	417,77	\$ 11.398,26
62	Costa Rica	18.486	0,97	2635,35	826,63					\$ 14.669,24
62	Malaysia	27.534	0,91	3715,19	236,76					\$ 23.250,37
64	Kuwait	58.590	0,34	5813,50	337,47					\$ 52.314,65
64	Serbia	17.192	0,60	3276,53	139,35					\$ 13.556,42
66	Mauritius	25.266	0,81	8558,20	420,30					\$ 15.990,60
67	Seychelles	26.903	0,63	6714,49	956,70					\$ 19.000,64
67	Trinidad and Tobago	26.231	1,01	8609,33	1107,30					\$ 16.145,81
69	Albania	13.998	0,73	1546,35	59,37					\$ 12.127,95
70	Cuba	8.621	#N/D	..	..	x y z	1,09	1.953,32	445,41	\$ 5.824,13
70	Iran (Islamic Republic of)	12.447	#N/D	#N/D	#N/D	x y z	0,737	3.781,65	349,24	\$ 8.046,77
72	Sri Lanka	12.707	0,97	1467,50	823,01					\$ 10.062,07
73	Bosnia and Herzegovina	14.872	0,69	2688,69	138,43					\$ 11.792,48
74	Grenada	15.641	1,33	5931,10	713,81					\$ 8.511,26
74	Mexico	19.160	0,64	2260,23	641,04					\$ 16.023,87
74	Saint Kitts and Nevis	25.038	#N/D	#N/D	#N/D	x y z	1,09	1.953,32	445,41	\$ 22.240,92
74	Ukraine	13.216	#N/D	1516,50	127,65	x	0,545			\$ 11.372,86
78	Antigua and Barbuda	20.895	0,93	3497,40	424,58					\$ 16.632,83
79	Peru	12.252	0,92	746,96	818,81					\$ 10.352,19
79	Thailand	17.781	1,05	1527,20	283,26					\$ 15.588,57
81	Armenia	13.894	1,01	2994,57	236,41					\$ 10.293,28
82	North Macedonia	15.865	0,73	2637,09	216,32					\$ 12.744,76

83	Colombia	14.257	0,99	1685,89	337,19					\$ 11.871,87
84	Brazil	14.263	0,85	2015,32	183,08					\$ 11.755,02
85	China	16.057	0,85	1340,64	84,46					\$ 14.322,78
86	Ecuador	11.044	1,35	1384,15	556,28					\$ 8.611,53
86	Saint Lucia	14.616	#N/D	#N/D	#N/D	x y z	1,09	1.953,32	445,41	\$ 11.818,98
88	Azerbaijan	13.784	0,79	1833,94	541,82					\$ 11.119,94
88	Dominican Republic	17.591	1,18	3925,47	820,07					\$ 12.414,46
90	Moldova (Republic of)	13.664	#N/D	#N/D	#N/D	x y z	0,545	4.468,38	417,77	\$ 8.578,53
91	Algeria	11.174	0,77	661,79	826,83					\$ 9.403,19
92	Lebanon	14.655	#N/D	..	..	x y z	0,737	3.781,65	349,24	\$ 10.254,64
93	Fiji	13.009	0,85	1386,65	465,27					\$ 10.847,26
94	Dominica	11.884	1,22	3566,84	412,57					\$ 7.460,34
95	Maldives	17.417	0,42	1565,51	227,87					\$ 15.469,01
95	Tunisia	10.414	0,60	2725,42	230,81					\$ 7.237,37
97	Saint Vincent and the Grenadines	12.378	#N/D	#N/D	#N/D	x y z	1,09	1.953,32	445,41	\$ 9.581,07
97	Suriname	14.324	1,14	2662,44	115,83					\$ 11.129,28
99	Mongolia	10.839	0,74	1107,34	172,34					\$ 9.287,80
100	Botswana	16.437	0,51	884,23	250,67					\$ 15.117,92
101	Jamaica	9.319	1,02	1218,55	433,04					\$ 7.297,06
102	Jordan	9.858	0,64	2781,90	215,25					\$ 6.626,65
103	Paraguay	12.224	0,95	2037,42	422,60					\$ 9.417,18
104	Tonga	6.365	#N/D	..	..	x y z	0,973	1.733,40	178,95	\$ 4.097,07
105	Libya	15.688	#N/D	..	..	x y z	0,737	3.781,65	349,24	\$ 11.287,82
106	Uzbekistan	7.142	#N/D	..	..	x y z	0,545	4.468,38	417,77	\$ 2.056,88
107	Bolivia (Plurinational State of)	8.554	#N/D	#N/D	#N/D	x y z	1,09	1.953,32	445,41	\$ 5.757,20
107	Indonesia	11.459	1,02	1142,94	271,81					\$ 9.671,68
107	Philippines	9.778	1,16	1054,45	328,34					\$ 7.972,33

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110	Belize	6.382	1,13	1604,87	191,88					\$	4.172,39
111	Samoa	6.309	#N/D	x y z	0,973	1.733,40	178,95	\$	4.041,15
111	Turkmenistan	14.909	#N/D	..	..	x y z	0,545	4.468,38	417,77	\$	9.823,60
113	Venezuela (Bolivarian Republic of)	7.045	#N/D	#N/D	#N/D	x y z	1,09	1.953,32	445,41	\$	4.248,05
114	South Africa	12.129	1,27	2165,92	145,46					\$	9.356,12
115	Palestine, State of	6.417	#N/D	#N/D	#N/D	x y z	0,737	3.781,65	349,24	\$	2.017,49
116	Egypt	11.466	#N/D	#N/D	#N/D	x y z	0,737	3.781,65	349,24	\$	7.066,25
117	Marshall Islands	5.039	#N/D	..	..	x y z	1,09	1.953,32	445,41	\$	2.242,46
117	Viet Nam	7.433	#N/D	#N/D	#N/D	x y z	0,804	884,58	241,86	\$	6.012,81
119	Gabon	13.930	0,96	838,53	209,08					\$	12.533,26
120	Kyrgyzstan	4.864	#N/D	1355,26	246,21		0,545	4.468,38	417,77	\$	4.247,70
121	Morocco	7.368	0,61	1318,60	175,53					\$	5.652,31
122	Guyana	9.455	0,73	2253,51	273,29					\$	6.662,86
123	Iraq	10.801	1,17	2687,06	132,17					\$	7.556,38
124	El Salvador	8.359	1,46	1078,20	293,70					\$	6.454,31
125	Tajikistan	3.954	0,91	1149,18	103,35					\$	2.368,18
126	Cabo Verde	7.019	0,62	2834,48	295,13					\$	3.663,26
127	Guatemala	8.494	#N/D	..	..	x y z	1,09	1.953,32	445,41	\$	5.697,50
128	Nicaragua	5.284	1,44	868,38	233,52					\$	3.657,62
129	Bhutan	10.746	1,05	1489,37	211,04					\$	8.663,27
130	Namibia	9.357	1,01	3001,08	118,10					\$	5.869,21
131	India	6.681	0,79	800,07	281,71					\$	5.311,59
132	Honduras	5.308	1,15	838,17	139,59					\$	3.912,40
133	Bangladesh	4.976	0,64	889,11	105,44					\$	3.746,60
134	Kiribati	4.260	#N/D	x y z	0,973	1.733,40	178,95	\$	1.992,23

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135	Sao Tome and Principe	3.952	0,90	#N/D	#N/D			1.733,40	178,95	\$ 2.039,71
136	Micronesia (Federated States of)	3.983	#N/D	#N/D	#N/D	x y z	0,871	490,23	89,64	\$ 3.084,95
137	Lao People's Democratic Republic	7.413	#N/D	#N/D	#N/D	x y z	0,871	490,23	89,64	\$ 6.515,54
138	Eswatini (Kingdom of)	7.919	#N/D	#N/D	#N/D	x y z	0,871	490,23	89,64	\$ 7.021,27
138	Ghana	5.269	0,82	194,50	95,79					\$ 4.677,87
140	Vanuatu	3.105	#N/D	..	..	x y z	0,973	1.733,40	178,95	\$ 837,30
141	Timor-Leste	4.440	#N/D	..	..	x y z	0,973	1.733,40	178,95	\$ 2.172,95
142	Nepal	3.457	0,99	479,24	13,07					\$ 2.604,13
143	Kenya	4.244	0,77	279,60	126,25					\$ 3.557,82
144	Cambodia	4.246	0,99	658,13	54,88					\$ 3.170,73
145	Equatorial Guinea	13.944	0,77	2797,37	467,62					\$ 10.398,83
146	Zambia	3.326	1,28	445,57	51,45					\$ 2.361,66
147	Myanmar	4.961	0,91	748,58	39,18					\$ 3.840,62
148	Angola	6.104	1,40	1239,27	220,76					\$ 4.131,93
149	Congo	2.879	#N/D	#N/D	#N/D	x y z	0,871	490,23	89,64	\$ 1.981,40
150	Zimbabwe	2.666	0,78	610,32	57,50					\$ 1.714,92
151	Solomon Islands	2.253	#N/D	..	..	x y z	0,871	490,23	89,64	\$ 1.355,56
151	Syrian Arab Republic	3.613	#N/D	..	..	x y z	0,737	899,65	349,24	\$ 2.095,15
153	Cameroon	3.581	0,89	551,25	193,98					\$ 2.509,36
154	Pakistan	5.005	0,77	1428,61	61,34					\$ 3.234,77
155	Papua New Guinea	4.301	#N/D	..	..	x y z	0,871	3.083,89	89,64	\$ 809,65
156	Comoros	3.099	1,10	831,97	68,72					\$ 1.796,89
157	Mauritania	5.135	0,88	375,33	61,90					\$ 4.377,24
158	Benin	3.254	0,65	317,53	58,72					\$ 2.640,01
159	Uganda	2.123	0,65	622,94	33,15					\$ 1.230,66

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160	Rwanda	2.155	0,76	340,52	47,90					\$	1.488,42
161	Nigeria	4.910	1,38	223,03	106,46					\$	4.076,29
162	Côte d'Ivoire	5.069	0,82	442,31	152,20					\$	4.176,62
163	Tanzania (United Republic of)	2.600	#N/D	#N/D	#N/D	x y z	0,737	1.307,72	349,24	\$	673,88
164	Madagascar	1.596	1,08	190,64	30,97					\$	980,84
165	Lesotho	3.151	0,61	562,42	36,11					\$	2.330,16
166	Djibouti	5.689	0,62	1256,34	177,09					\$	4.031,08
167	Togo	1.602	1,94	239,18	32,61					\$	622,82
168	Senegal	3.309	0,75	510,92	65,36					\$	2.461,18
169	Afghanistan	2.229	#N/D	..	..	x y z	0,545	555,11	417,77	\$	1.057,56
170	Haiti	1.709	1,10	274,76	16,13					\$	1.018,25
170	Sudan	3.829	1,08	879,64	228,69					\$	2.326,49
172	Gambia	2.168	#N/D	#N/D	#N/D	x y z	0,737	1.090,45	349,24	\$	459,19
173	Ethiopia	2.207	0,72	558,16	51,27					\$	1.333,94
174	Malawi	1.035	0,29	174,99	24,88					\$	730,78
175	Congo (Democratic Republic of the)	1.063	#N/D	#N/D	#N/D	x y z	0,737	534,46	349,24	\$	444,29
175	Guinea-Bissau	1.996	0,93	161,74	5,51					\$	1.491,17
175	Liberia	1.258	0,97	437,45	18,27					\$	448,28
178	Guinea	2.405	0,90	424,73	85,37					\$	1.565,12
179	Yemen	1.594	#N/D	..	..	x y z	0,545	396,83	417,77	\$	580,18
180	Eritrea	2.793	#N/D	..	..	x y z	0,737	1.405,12	349,24	\$	770,11
181	Mozambique	1.250	0,38	124,73	44,61					\$	941,27
182	Burkina Faso	2.133	0,57	225,82	7,72					\$	1.689,91
182	Sierra Leone	1.668	1,24	368,79	18,99					\$	826,37
184	Mali	2.269	0,60	339,24	96,15					\$	1.614,38

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18 5	Burundi	754	0,71	229,09	25,98					\$ 240,43
18 5	South Sudan	2.003	#N/ D	x y z	0,737	1.007,67	349,24	\$ 377,40
18 7	Chad	1.555	0,71	85,20	66,44					\$ 1.144,94
18 8	Central African Republic	993	1,02	94,58	11,71					\$ 514,06
18 9	Niger	1.201	0,61	80,72	27,42					\$ 870,83

Annex III: Tables of cost for Diets

Country Name	Classification Name	Classification Code	Country Code	Time	Time Code	Cost of an energy sufficient diet [CoCA]	Cost of a nutrient adequate diet [CoNA]	Cost of a healthy diet [CoHD]	Cost of a healthy diet relative to the cost of sufficient energy from starchy staples [CoHD_CoCA]
Australia	Food Prices for Nutrition Data	FPN	AUS	2017	YR2017	0,307	1,595	2,259	7,36
Austria	Food Prices for Nutrition Data	FPN	AUT	2017	YR2017	0,346	2,256	2,772	8,01
Albania	Food Prices for Nutrition Data	FPN	ALB	2017	YR2017	0,725	2,471	3,952	5,45
Algeria	Food Prices for Nutrition Data	FPN	DZA	2017	YR2017	0,773	2,323	3,763	4,87
Angola	Food Prices for Nutrition Data	FPN	AGO	2017	YR2017	1,403	3,231	4,327	3,08
Anguilla	Food Prices for Nutrition Data	FPN	AIA	2017	YR2017	1,308	2,433	3,717	2,84
Antigua and Barbuda	Food Prices for Nutrition Data	FPN	ATG	2017	YR2017	0,933	3,017	4,112	4,41
Argentina	Food Prices for Nutrition Data	FPN	ARG	2017	YR2017	0,652	2,625	3,341	5,12
Armenia	Food Prices for Nutrition Data	FPN	ARM	2017	YR2017	1,013	2,208	3,096	3,06
Aruba	Food Prices for Nutrition Data	FPN	ABW	2017	YR2017	1,13	2,835	3,418	3,02
Azerbaijan	Food Prices for Nutrition Data	FPN	AZE	2017	YR2017	0,789	1,836	2,348	2,98
Bahamas, The	Food Prices for Nutrition Data	FPN	BHS	2017	YR2017	1,049	4,683	4,276	4,08
Bahrain	Food Prices for Nutrition Data	FPN	BHR	2017	YR2017	0,792	2,829	3,379	4,27
Bangladesh	Food Prices for Nutrition Data	FPN	BGD	2017	YR2017	0,644	1,947	2,882	4,48
Barbados	Food Prices for Nutrition Data	FPN	BRB	2017	YR2017	0,896	2,226	..	..
Belarus	Food Prices for Nutrition Data	FPN	BLR	2017	YR2017	0,8	2,161	3,177	3,97
Belgium	Food Prices for Nutrition Data	FPN	BEL	2017	YR2017	0,263	2,406	2,862	10,88
Belize	Food Prices for Nutrition Data	FPN	BLZ	2017	YR2017	1,13	2,803	2,476	2,19
Benin	Food Prices for Nutrition Data	FPN	BEN	2017	YR2017	0,652	2,498	3,55	5,44
Bermuda	Food Prices for Nutrition Data	FPN	BMU	2017	YR2017	1,099	4,706	4,072	3,71
Bhutan	Food Prices for Nutrition Data	FPN	BTN	2017	YR2017	1,047	2,802	4,383	4,19
Bolivia	Food Prices for Nutrition Data	FPN	BOL	2017	YR2017	1,468	3,338	3,551	2,42
Bonaire	Food Prices for Nutrition Data	FPN	BON	2017	YR2017	0,746	3,329	..	..

Bosnia and Herzegovina	Food Prices for Nutrition Data	FPN	BIH	2017	YR2017	0,691	3,051	3,847	5,57
Botswana	Food Prices for Nutrition Data	FPN	BWA	2017	YR2017	0,505	2,25	3,622	7,17
Brazil	Food Prices for Nutrition Data	FPN	BRA	2017	YR2017	0,848	2,657	2,809	3,31
British Virgin Islands	Food Prices for Nutrition Data	FPN	VGB	2017	YR2017	1,563	3,059	3,235	2,07
Brunei Darussalam	Food Prices for Nutrition Data	FPN	BRN	2017	YR2017	0,762	2,376	4,126	5,41
Bulgaria	Food Prices for Nutrition Data	FPN	BGR	2017	YR2017	0,504	2,768	3,78	7,5
Burkina Faso	Food Prices for Nutrition Data	FPN	BFA	2017	YR2017	0,574	2,538	3,173	5,53
Burundi	Food Prices for Nutrition Data	FPN	BDI	2017	YR2017	0,708	1,589	2,988	4,22
Cabo Verde	Food Prices for Nutrition Data	FPN	CPV	2017	YR2017	0,62	2,522	3,358	5,42
Cambodia	Food Prices for Nutrition Data	FPN	KHM	2017	YR2017	0,993	2,761	3,618	3,64
Cameroon	Food Prices for Nutrition Data	FPN	CMR	2017	YR2017	0,894	2,065	2,616	2,93
Canada	Food Prices for Nutrition Data	FPN	CAN	2017	YR2017	0,673	2,111	2,863	4,25
Cayman Islands	Food Prices for Nutrition Data	FPN	CYM	2017	YR2017	1,095	2,231	2,928	2,67
Central African Republic	Food Prices for Nutrition Data	FPN	CAF	2017	YR2017	1,021	1,706	3,423	3,35
Chad	Food Prices for Nutrition Data	FPN	TCD	2017	YR2017	0,709	1,761	2,831	3,99
Chile	Food Prices for Nutrition Data	FPN	CHL	2017	YR2017	0,644	2,179	3,053	4,74
China	Food Prices for Nutrition Data	FPN	CHN	2017	YR2017	0,848	2,111	2,571	3,03
Colombia	Food Prices for Nutrition Data	FPN	COL	2017	YR2017	0,991	2,526	2,863	2,89
Comoros	Food Prices for Nutrition Data	FPN	COM	2017	YR2017	1,101	3,461	..	..
Congo, Dem. Rep.	Food Prices for Nutrition Data	FPN	COD	2017	YR2017	0,56	2,049	2,921	5,22
Congo, Rep.	Food Prices for Nutrition Data	FPN	COG	2017	YR2017	0,987	2,576	3,343	3,39
Costa Rica	Food Prices for Nutrition Data	FPN	CRI	2017	YR2017	0,973	2,824	3,961	4,07
Côte d'Ivoire	Food Prices for Nutrition Data	FPN	CIV	2017	YR2017	0,815	1,619	3,273	4,02
Croatia	Food Prices for Nutrition Data	FPN	HRV	2017	YR2017	0,663	3,211	4,168	6,29
Curacao	Food Prices for Nutrition Data	FPN	CUW	2017	YR2017	1,137	2,396	2,866	2,52
Cyprus	Food Prices for Nutrition Data	FPN	CYP	2017	YR2017	0,577	2,068	2,846	4,93
Czech Republic	Food Prices for Nutrition Data	FPN	CZE	2017	YR2017	0,441	2,361	2,899	6,57
Denmark	Food Prices for Nutrition Data	FPN	DNK	2017	YR2017	0,3	1,728	2,376	7,92
Djibouti	Food Prices for Nutrition Data	FPN	DJI	2017	YR2017	0,616	2,459	2,797	4,54

Dominica	Food Prices for Nutrition Data	FPN	DMA	2017	YR2017	1,217	3,478	4	3,29
Dominican Republic	Food Prices for Nutrition Data	FPN	DOM	2017	YR2017	1,181	2,876	3,521	2,98
East Asia & Pacific	Food Prices for Nutrition Data	FPN	EAS	2017	YR2017	0,973	2,62	3,7	..
Ecuador	Food Prices for Nutrition Data	FPN	ECU	2017	YR2017	1,348	2,512	2,788	2,07
Egypt, Arab Rep.	Food Prices for Nutrition Data	FPN	EGY	2017	YR2017	0,988	2,29	3,457	3,5
El Salvador	Food Prices for Nutrition Data	FPN	SLV	2017	YR2017	1,46	5,866	..	..
Equatorial Guinea	Food Prices for Nutrition Data	FPN	GNQ	2017	YR2017	0,768	1,865	3,526	4,59
Estonia	Food Prices for Nutrition Data	FPN	EST	2017	YR2017	0,418	2,554	3,125	7,48
Eswatini	Food Prices for Nutrition Data	FPN	SWZ	2017	YR2017	0,931	2,244	3,428	3,68
Ethiopia	Food Prices for Nutrition Data	FPN	ETH	2017	YR2017	0,721	2,004	3,108	4,31
Europe & Central Asia	Food Prices for Nutrition Data	FPN	ECS	2017	YR2017	0,545	2,232	2,954	..
Fiji	Food Prices for Nutrition Data	FPN	FJI	2017	YR2017	0,849	2,558	3,612	4,25
Finland	Food Prices for Nutrition Data	FPN	FIN	2017	YR2017	0,28	2,465	2,545	9,09
France	Food Prices for Nutrition Data	FPN	FRA	2017	YR2017	0,315	1,874	2,936	9,32
Gabon	Food Prices for Nutrition Data	FPN	GAB	2017	YR2017	0,956	2,57	3,358	3,51
Gambia, The	Food Prices for Nutrition Data	FPN	GMB	2017	YR2017	0,983	2,529	2,942	2,99
Germany	Food Prices for Nutrition Data	FPN	DEU	2017	YR2017	0,262	2,224	2,786	10,63
Ghana	Food Prices for Nutrition Data	FPN	GHA	2017	YR2017	0,824	2,516	3,767	4,57
Greece	Food Prices for Nutrition Data	FPN	GRC	2017	YR2017	0,672	2,557	3,037	4,52
Grenada	Food Prices for Nutrition Data	FPN	GRD	2017	YR2017	1,328	3,767	5,382	4,05
Guinea	Food Prices for Nutrition Data	FPN	GIN	2017	YR2017	0,904	2,215	3,655	4,04
Guinea-Bissau	Food Prices for Nutrition Data	FPN	GNB	2017	YR2017	0,925	1,857	3,164	3,42
Guyana	Food Prices for Nutrition Data	FPN	GUY	2017	YR2017	0,727	3,606	4,629	6,37
Haiti	Food Prices for Nutrition Data	FPN	HTI	2017	YR2017	1,095	2,929	3,93	3,59
High income	Food Prices for Nutrition Data	FPN	HIC	2017	YR2017	0,709	2,401	3,138	..
Honduras	Food Prices for Nutrition Data	FPN	HND	2017	YR2017	1,146	3,472	3,36	2,93
Hong Kong SAR, China	Food Prices for Nutrition Data	FPN	HKG	2017	YR2017	0,908	2,316	3,659	4,03
Hungary	Food Prices for Nutrition Data	FPN	HUN	2017	YR2017	0,434	2,258	3,302	7,61
Iceland	Food Prices for Nutrition Data	FPN	ISL	2017	YR2017	0,378	2,422	2,213	5,85

India	Food Prices for Nutrition Data	FPN	IND	2017	YR2017	0,789	2,125	2,824	3,58
Indonesia	Food Prices for Nutrition Data	FPN	IDN	2017	YR2017	1,021	2,664	4,129	4,04
Iran, Islamic Rep.	Food Prices for Nutrition Data	FPN	IRN	2017	YR2017	0,871	2,009	3,005	3,45
Iraq	Food Prices for Nutrition Data	FPN	IRQ	2017	YR2017	1,165	2,505	3,378	2,9
Ireland	Food Prices for Nutrition Data	FPN	IRL	2017	YR2017	0,568	2,026	2,397	4,22
Israel	Food Prices for Nutrition Data	FPN	ISR	2017	YR2017	0,503	1,898	2,436	4,84
Italy	Food Prices for Nutrition Data	FPN	ITA	2017	YR2017	0,312	2,226	2,885	9,25
Jamaica	Food Prices for Nutrition Data	FPN	JAM	2017	YR2017	1,015	4,057	5,975	5,89
Japan	Food Prices for Nutrition Data	FPN	JPN	2017	YR2017	2,958	3,557	5,529	1,87
Jordan	Food Prices for Nutrition Data	FPN	JOR	2017	YR2017	0,643	1,61	3,412	5,31
Kazakhstan	Food Prices for Nutrition Data	FPN	KAZ	2017	YR2017	0,653	1,753	2,391	3,66
Kenya	Food Prices for Nutrition Data	FPN	KEN	2017	YR2017	0,767	1,851	2,846	3,71
Korea, Rep.	Food Prices for Nutrition Data	FPN	KOR	2017	YR2017	0,669	4,242	4,712	7,04
Kuwait	Food Prices for Nutrition Data	FPN	KWT	2017	YR2017	0,341	1,791	3,344	9,81
Kyrgyz Republic	Food Prices for Nutrition Data	FPN	KGZ	2017	YR2017	0,965	2,459	2,97	3,08
Lao PDR	Food Prices for Nutrition Data	FPN	LAO	2017	YR2017	0,724	2,901	3,776	5,22
Latin America & Caribbean	Food Prices for Nutrition Data	FPN	LCN	2017	YR2017	1,09	3,056	3,619	..
Latvia	Food Prices for Nutrition Data	FPN	LVA	2017	YR2017	0,442	2,029	3,124	7,07
Lesotho	Food Prices for Nutrition Data	FPN	LSO	2017	YR2017	0,608	2,306	3,77	6,2
Liberia	Food Prices for Nutrition Data	FPN	LBR	2017	YR2017	0,971	2,982	4,018	4,14
Lithuania	Food Prices for Nutrition Data	FPN	LTU	2017	YR2017	0,505	1,969	3,003	5,95
Low income	Food Prices for Nutrition Data	FPN	LIC	2017	YR2017	0,835	2,038	3,084	..
Lower middle income	Food Prices for Nutrition Data	FPN	LMC	2017	YR2017	0,945	2,507	3,398	..
Luxembourg	Food Prices for Nutrition Data	FPN	LUX	2017	YR2017	0,335	2,038	2,492	7,44
Madagascar	Food Prices for Nutrition Data	FPN	MDG	2017	YR2017	1,079	2,589	2,987	2,77
Malawi	Food Prices for Nutrition Data	FPN	MWI	2017	YR2017	0,285	1,616	2,724	9,56
Malaysia	Food Prices for Nutrition Data	FPN	MYS	2017	YR2017	0,909	2,384	3,224	3,55
Maldives	Food Prices for Nutrition Data	FPN	MDV	2017	YR2017	0,423	2,686	3,581	8,47
Mali	Food Prices for Nutrition Data	FPN	MLI	2017	YR2017	0,6	1,985	2,9	4,83

Malta	Food Prices for Nutrition Data	FPN	MLT	2017	YR2017	0,741	2,647	3,494	4,72
Mauritania	Food Prices for Nutrition Data	FPN	MRT	2017	YR2017	0,877	2,814	3,451	3,94
Mauritius	Food Prices for Nutrition Data	FPN	MUS	2017	YR2017	0,814	2,519	3,313	4,07
Mexico	Food Prices for Nutrition Data	FPN	MEX	2017	YR2017	0,643	2,483	2,993	4,65
Middle East & North Africa	Food Prices for Nutrition Data	FPN	MEA	2017	YR2017	0,737	2,032	3,14	..
Moldova	Food Prices for Nutrition Data	FPN	MDA	2017	YR2017	0,802	1,683	2,46	3,07
Mongolia	Food Prices for Nutrition Data	FPN	MNG	2017	YR2017	0,743	2,259	4,544	6,12
Montenegro	Food Prices for Nutrition Data	FPN	MNE	2017	YR2017	0,551	2,294	3,397	6,17
Montserrat	Food Prices for Nutrition Data	FPN	MSR	2017	YR2017	1,381	3,684	4,883	3,54
Morocco	Food Prices for Nutrition Data	FPN	MAR	2017	YR2017	0,608	1,912	2,71	4,46
Mozambique	Food Prices for Nutrition Data	FPN	MOZ	2017	YR2017	0,383	1,969	3,031	7,91
Myanmar	Food Prices for Nutrition Data	FPN	MMR	2017	YR2017	0,91	2,6	3,706	4,07
Namibia	Food Prices for Nutrition Data	FPN	NAM	2017	YR2017	1,009	1,839	3,255	3,23
Nepal	Food Prices for Nutrition Data	FPN	NPL	2017	YR2017	0,987	2,565	4,127	4,18
Netherlands	Food Prices for Nutrition Data	FPN	NLD	2017	YR2017	0,297	1,771	2,743	9,24
New Zealand	Food Prices for Nutrition Data	FPN	NZL	2017	YR2017	0,489	2,223	2,671	5,46
Nicaragua	Food Prices for Nutrition Data	FPN	NIC	2017	YR2017	1,436	2,489	3,191	2,22
Niger	Food Prices for Nutrition Data	FPN	NER	2017	YR2017	0,608	1,658	2,85	4,69
Nigeria	Food Prices for Nutrition Data	FPN	NGA	2017	YR2017	1,382	2,115	3,565	2,58
North America	Food Prices for Nutrition Data	FPN	NAC	2017	YR2017	0,892	3,011	3,386	..
North Macedonia	Food Prices for Nutrition Data	FPN	MKD	2017	YR2017	0,73	2,972	3,318	4,55
Norway	Food Prices for Nutrition Data	FPN	NOR	2017	YR2017	1,122	2,849	3,325	2,96
Oman	Food Prices for Nutrition Data	FPN	OMN	2017	YR2017	0,522	1,899	2,815	5,39
Pakistan	Food Prices for Nutrition Data	FPN	PAK	2017	YR2017	0,768	1,946	3,408	4,44
Panama	Food Prices for Nutrition Data	FPN	PAN	2017	YR2017	1,128	3,224	4,225	3,75
Paraguay	Food Prices for Nutrition Data	FPN	PRY	2017	YR2017	0,95	3,886	3,43	3,61
Peru	Food Prices for Nutrition Data	FPN	PER	2017	YR2017	0,916	2,24	3,084	3,37
Philippines	Food Prices for Nutrition Data	FPN	PHL	2017	YR2017	1,158	2,82	3,843	3,32
Poland	Food Prices for Nutrition Data	FPN	POL	2017	YR2017	0,39	1,925	2,909	7,46

Portugal	Food Prices for Nutrition Data	FPN	PRT	2017	YR2017	0,412	1,835	2,513	6,1
Qatar	Food Prices for Nutrition Data	FPN	QAT	2017	YR2017	0,602	1,173	2,375	3,95
Romania	Food Prices for Nutrition Data	FPN	ROU	2017	YR2017	0,489	2,186	2,921	5,97
Russian Federation	Food Prices for Nutrition Data	FPN	RUS	2017	YR2017	0,606	2,215	3,149	5,2
Rwanda	Food Prices for Nutrition Data	FPN	RWA	2017	YR2017	0,763	1,311	2,609	3,42
Sao Tome and Principe	Food Prices for Nutrition Data	FPN	STP	2017	YR2017	0,896	2,569	3,288	3,67
Saudi Arabia	Food Prices for Nutrition Data	FPN	SAU	2017	YR2017	0,883	1,752	3,441	3,9
Senegal	Food Prices for Nutrition Data	FPN	SEN	2017	YR2017	0,745	1,858	2,19	2,94
Serbia	Food Prices for Nutrition Data	FPN	SRB	2017	YR2017	0,601	2,669	4,07	6,77
Seychelles	Food Prices for Nutrition Data	FPN	SYC	2017	YR2017	0,634	2,169	4,01	6,32
Sierra Leone	Food Prices for Nutrition Data	FPN	SLE	2017	YR2017	1,243	2,201	2,842	2,29
Singapore	Food Prices for Nutrition Data	FPN	SGP	2017	YR2017	0,751	2,024	2,775	3,7
Sint Maarten (Dutch part)	Food Prices for Nutrition Data	FPN	SXM	2017	YR2017	2,251	3,944	4,462	1,98
Slovak Republic	Food Prices for Nutrition Data	FPN	SVK	2017	YR2017	0,363	1,977	3,013	8,3
Slovenia	Food Prices for Nutrition Data	FPN	SVN	2017	YR2017	0,434	2,015	2,798	6,45
South Africa	Food Prices for Nutrition Data	FPN	ZAF	2017	YR2017	1,265	3,407	4,102	3,24
South Asia	Food Prices for Nutrition Data	FPN	SAS	2017	YR2017	0,804	2,328	3,558	..
Spain	Food Prices for Nutrition Data	FPN	ESP	2017	YR2017	0,438	1,752	2,699	6,16
Sri Lanka	Food Prices for Nutrition Data	FPN	LKA	2017	YR2017	0,972	2,228	3,702	3,81
St. Kitts and Nevis	Food Prices for Nutrition Data	FPN	KNA	2017	YR2017	0,533	2,994	2,998	5,62
St. Lucia	Food Prices for Nutrition Data	FPN	LCA	2017	YR2017	1,05	2,651	3,263	3,11
St. Vincent and the Grenadines	Food Prices for Nutrition Data	FPN	VCT	2017	YR2017	1,322	3,054	4,131	3,12
Sub-Saharan Africa	Food Prices for Nutrition Data	FPN	SSF	2017	YR2017	0,871	2,228	3,249	..
Sudan	Food Prices for Nutrition Data	FPN	SDN	2017	YR2017	1,079	2,089	3,674	3,41
Suriname	Food Prices for Nutrition Data	FPN	SUR	2017	YR2017	1,142	3,386	4,969	4,35
Sweden	Food Prices for Nutrition Data	FPN	SWE	2017	YR2017	0,8	2,434	3,086	3,86
Switzerland	Food Prices for Nutrition Data	FPN	CHE	2017	YR2017	0,418	2,101	2,523	6,04
Taiwan, China	Food Prices for Nutrition Data	FPN	TWN	2017	YR2017	1,459	2,996	3,99	2,73
Tajikistan	Food Prices for Nutrition Data	FPN	TJK	2017	YR2017	0,912	2,345	3,027	3,32

Tanzania	Food Prices for Nutrition Data	FPN	TZA	2017	YR2017	0,994	1,944	2,598	2,61
Thailand	Food Prices for Nutrition Data	FPN	THA	2017	YR2017	1,047	2,883	3,971	3,79
Togo	Food Prices for Nutrition Data	FPN	TGO	2017	YR2017	1,939	2,31	..	..
Trinidad and Tobago	Food Prices for Nutrition Data	FPN	TTO	2017	YR2017	1,009	3,135	3,928	3,89
Tunisia	Food Prices for Nutrition Data	FPN	TUN	2017	YR2017	0,604	1,88	3,476	5,75
Türkiye	Food Prices for Nutrition Data	FPN	TUR	2017	YR2017	0,709	2,286	2,873	4,05
Turks and Caicos Islands	Food Prices for Nutrition Data	FPN	TCA	2017	YR2017	1,128	2,453	2,809	2,49
Uganda	Food Prices for Nutrition Data	FPN	UGA	2017	YR2017	0,648	1,8	2,749	4,24
United Arab Emirates	Food Prices for Nutrition Data	FPN	ARE	2017	YR2017	0,746	1,806	2,755	3,69
United Kingdom	Food Prices for Nutrition Data	FPN	GBR	2017	YR2017	0,263	1,526	1,822	6,93
United States	Food Prices for Nutrition Data	FPN	USA	2017	YR2017	0,905	2,215	3,225	3,56
Upper middle income	Food Prices for Nutrition Data	FPN	UMC	2017	YR2017	0,87	2,627	3,524	..
Uruguay	Food Prices for Nutrition Data	FPN	URY	2017	YR2017	0,694	2,129	3,073	4,43
Vietnam	Food Prices for Nutrition Data	FPN	VNM	2017	YR2017	0,975	2,514	3,586	3,68
West Bank and Gaza	Food Prices for Nutrition Data	FPN	PSE	2017	YR2017	1,124	1,761	3,342	2,97
World	Food Prices for Nutrition Data	FPN	WLD	2017	YR2017	0,834	2,457	3,314	..
Zambia	Food Prices for Nutrition Data	FPN	ZMB	2017	YR2017	1,279	2,38	3,085	2,41
Zimbabwe	Food Prices for Nutrition Data	FPN	ZWE	2017	YR2017	0,775	2,297	3,456	4,46

Annex IV: Tables of cost of Housing

Country Name	2017 [YR2017]	2017 [YR2017] Per month
Afghanistan	..	..
Albania	1.546,35	128,86
Algeria	661,79	55,15
American Samoa	..	..
Angola	1.239,27	103,27
Anguilla	4.733,79	394,48
Antigua and Barbuda	3.497,40	291,45
Argentina	1.899,18	158,27
Armenia	2.994,57	249,55
Aruba	12.854,42	1.071,20
Australia	4.837,10	403,09
Austria	6.269,70	522,47
Azerbaijan	1.833,94	152,83
Bahamas, The	8.476,08	706,34
Bahrain	5.690,29	474,19
Bangladesh	889,11	74,09
Barbados	7.042,81	586,90
Belarus	2.975,38	247,95
Belgium	5.239,83	436,65
Belize	1.604,87	133,74
Benin	317,53	26,46
Bermuda	10.476,98	873,08
Bhutan	1.489,37	124,11
Bolivia	1.165,60	97,13
Bonaire	..	..
Bosnia and Herzegovina	2.688,69	224,06
Botswana	884,23	73,69
Brazil	2.015,32	167,94
Brunei Darussalam	3.737,55	311,46
Bulgaria	3.669,66	305,81
Burkina Faso	225,82	18,82
Burundi	229,09	19,09
Cabo Verde	2.834,48	236,21
Cambodia	658,13	54,84
Cameroon	551,25	45,94
Canada	5.962,92	496,91

Cayman Islands	9.324,99	777,08
Central African Republic	94,58	7,88
Chad	85,20	7,10
Chile	2.007,15	167,26
China	1.340,64	111,72
Colombia	1.685,89	140,49
Comoros	831,97	69,33
Congo, Dem. Rep.	141,79	11,82
Congo, Rep.	843,46	70,29
Cook Islands	..	..
Costa Rica	2.635,35	219,61
Côte d'Ivoire	442,31	36,86
Croatia	4.557,80	379,82
Cuba	..	..
Curaçao	5.320,92	443,41
Cyprus	4.981,28	415,11
Czech Republic	4.868,00	405,67
Denmark	5.598,02	466,50
Djibouti	1.256,34	104,69
Dominica	3.566,84	297,24
Dominican Republic	3.925,47	327,12
East Asia & Pacific (ICP)	1.733,40	144,45
Ecuador	1.384,15	115,35
Egypt, Arab Rep.	4.883,44	406,95
El Salvador	1.078,20	89,85
Equatorial Guinea	2.797,37	233,11
Eritrea	..	..
Estonia	3.676,08	306,34
Eswatini	1.582,41	131,87
Ethiopia	558,16	46,51
Europe & Central Asia (ICP)	4.468,38	372,37
Fiji	1.386,65	115,55
Finland	5.864,98	488,75
France	5.665,68	472,14
French Polynesia	..	..
Gabon	838,53	69,88
Gambia, The	291,92	24,33

Georgia	2.542,20	211,85
Germany	5.566,21	463,85
Ghana	194,50	16,21
Greece	4.994,68	416,22
Grenada	5.931,10	494,26
Guam	..	..
Guatemala	..	..
Guinea	424,73	35,39
Guinea-Bissau	161,74	13,48
Guyana	2.253,51	187,79
Haiti	274,76	22,90
Honduras	838,17	69,85
Hong Kong SAR, China	7.721,83	643,49
Hungary	3.713,40	309,45
Iceland	6.466,34	538,86
India	800,07	66,67
Indonesia	1.142,94	95,25
Iran, Islamic Rep.	3.067,33	255,61
Iraq	2.687,06	223,92
Ireland	4.279,39	356,62
Israel	4.126,40	343,87
Italy	5.750,40	479,20
Jamaica	1.218,55	101,55
Japan	5.505,06	458,75
Jordan	2.781,90	231,82
Kazakhstan	3.222,86	268,57
Kenya	279,60	23,30
Kiribati	..	..
Korea, Rep.	4.420,27	368,36
Kosovo	..	..
Kuwait	5.813,50	484,46
Kyrgyzstan	1.355,26	112,94
Lao PDR	741,08	61,76
Latin America & Caribbean (ICP)	1.953,32	162,78
Latvia	4.045,21	337,10
Lebanon	..	..
Lesotho	562,42	46,87
Liberia	437,45	36,45
Libya	..	..
Lithuania	4.455,26	371,27

Luxembourg	6.439,90	536,66
Macao SAR, China	..	..
Madagascar	190,64	15,89
Malawi	174,99	14,58
Malaysia	3.715,19	309,60
Maldives	1.565,51	130,46
Mali	339,24	28,27
Malta	3.287,43	273,95
Marshall Islands	..	..
Mauritania	375,33	31,28
Mauritius	8.558,20	713,18
Mexico	2.260,23	188,35
Micronesia, Federated States of	..	..
Middle East & North Africa (ICP)	3.781,65	315,14
Moldova	1.853,15	154,43
Mongolia	1.107,34	92,28
Montenegro	3.209,74	267,48
Montserrat	5.128,69	427,39
Morocco	1.318,60	109,88
Mozambique	124,73	10,39
Myanmar	748,58	62,38
Namibia	3.001,08	250,09
Nauru	..	..
Nepal	479,24	39,94
Netherlands	4.961,36	413,45
New Caledonia	..	..
New Zealand	4.488,81	374,07
Nicaragua	868,38	72,36
Niger	80,72	6,73
Nigeria	223,03	18,59
Niue	..	..
North America (ICP)	7.461,37	621,78
North Macedonia	2.637,09	219,76
Northern Mariana Islands	..	..
Norway	5.464,64	455,39
Oman	3.482,22	290,19
Pakistan	1.428,61	119,05
Palau	..	..
Panama	5.380,77	448,40
Papua New Guinea	..	..

Paraguay	2.037,42	169,78
Peru	746,96	62,25
Philippines	1.054,45	87,87
Poland	5.195,11	432,93
Portugal	4.039,61	336,63
Puerto Rico	..	..
Qatar	5.121,83	426,82
Romania	4.313,95	359,50
Russian Federation	3.074,82	256,24
Rwanda	340,52	28,38
Samoa	..	..
San Marino	..	..
São Tomé and Príncipe	477,81	39,82
Saudi Arabia	9.627,33	802,28
Senegal	510,92	42,58
Serbia	3.276,53	273,04
Seychelles	6.714,49	559,54
Sierra Leone	368,79	30,73
Singapore	4.882,54	406,88
Sint Maarten	13.784,16	1.148,68
Slovakia	4.598,80	383,23
Slovenia	4.170,72	347,56
Solomon Islands	..	..
Somalia	..	..
South Africa	2.165,92	180,49
South Asia (ICP)	884,58	73,71
South Sudan	..	..
Spain	4.694,33	391,19
Sri Lanka	1.467,50	122,29
St. Kitts and Nevis	4.364,73	363,73
St. Lucia	914,31	76,19
St. Vincent and the Grenadines	3.912,84	326,07
Sub-Saharan Africa (ICP)	490,23	40,85
Sudan	879,64	73,30

Suriname	2.662,44	221,87
Sweden	6.161,69	513,47
Switzerland	6.610,72	550,89
Syrian Arab Republic	..	..
Taiwan, China	5.157,53	429,79
Tajikistan	1.149,18	95,77
Tanzania	211,11	17,59
Thailand	1.527,20	127,27
Timor-Leste	..	..
Togo	239,18	19,93
Tokelau	..	..
Tonga	..	..
Trinidad and Tobago	8.609,33	717,44
Tunisia	2.725,42	227,12
Turkey	5.742,64	478,55
Turkmenistan	..	..
Turks and Caicos Islands	1.007,65	83,97
Tuvalu	..	..
Uganda	622,94	51,91
Ukraine	1.516,50	126,38
United Arab Emirates	8.167,08	680,59
United Kingdom	4.799,72	399,98
United States	7.629,04	635,75
Uruguay	4.227,90	352,32
Uzbekistan	..	..
Vanuatu	..	..
Venezuela, RB	..	..
Vietnam	1.206,74	100,56
Virgin Islands, British	727,34	60,61
Wallis and Futuna	..	..
West Bank and Gaza	623,34	51,95
WORLD	2.099,54	174,96
Yemen	..	..
Zambia	445,57	37,13
Zimbabwe	610,32	50,86

Annex V: Tables of cost of Transport

Country Name	2017 [YR2017] - 1107000:TRANSPORT [1107000]	2017 [YR2017] - 1107300:TRANSPORT SERVICES [1107300]
Afghanistan	..	..
Albania	219,7908814	59,37
Algeria	772,9051238	826,83
American Samoa	..	..
Angola	218,8956102	220,76
Anguilla	2304,120176	733,67
Antigua and Barbuda	1069,356543	424,58
Argentina	1455,472819	737,57
Armenia	336,7382459	236,41
Aruba	1970,582302	202,47
Australia	3291,572919	644,19
Austria	2324,218223	438,78
Azerbaijan	535,2610881	541,82
Bahamas, The	1576,482661	447,65
Bahrain	1986,314202	260,80
Bangladesh	82,03695017	105,44
Barbados	683,8503053	448,92
Belarus	552,9573728	323,28
Belgium	1896,999649	203,02
Belize	423,0468537	191,88
Benin	96,01034133	58,72
Bermuda	3020,309371	1549,21
Bhutan	466,0959218	211,04
Bolivia	839,0839414	702,43
Bonaire	1673,292897	637,57
Bosnia and Herzegovina	459,9779089	138,43
Botswana	220,9632324	250,67
Brazil	761,0819758	183,08
Brunei Darussalam	1094,65481	210,02
Bulgaria	911,6569565	421,30
Burkina Faso	48,6952405	7,72
Burundi	24,19461325	25,98
Cabo Verde	294,599667	295,13
Cambodia	123,4315189	54,88
Cameroon	143,1075811	193,98
Canada	3455,521466	311,08
Cayman Islands	3933,78676	1401,42
Central African Republic	27,41487334	11,71
Chad	114,4379812	66,44

Chile	1434,722405	783,73
China	469,7942136	84,46
Colombia	495,8958178	337,19
Comoros	131,369596	68,72
Congo, Dem. Rep.	27,08850981	28,32
Congo, Rep.	119,8623399	136,67
Cook Islands	..	..
Costa Rica	948,5596288	826,63
Côte d'Ivoire	147,9852115	152,20
Croatia	865,5029103	228,58
Cuba	..	..
Curaçao	1920,451203	703,64
Cyprus	2717,848035	533,74
Czech Republic	1129,200997	241,65
Denmark	2005,705651	225,79
Djibouti	433,3601236	177,09
Dominica	1138,117272	412,57
Dominican Republic	794,2027354	820,07
East Asia & Pacific (ICP)	615,619135	178,95
Ecuador	776,9314121	556,28
Egypt, Arab Rep.	589,5092053	468,96
El Salvador	423,8422086	293,70
Equatorial Guinea	559,9640429	467,62
Eritrea	..	..
Estonia	1228,916227	330,40
Eswatini	315,9420534	61,38
Ethiopia	30,43136972	51,27
Europe & Central Asia (ICP)	1509,856257	417,77
Fiji	594,1036878	465,27
Finland	2000,187604	361,22
France	2155,638002	395,22
French Polynesia	..	..
Gabon	267,0111588	209,08
Gambia, The	22,6377299	26,17
Georgia	552,8262769	289,41
Germany	2350,92978	374,16
Ghana	111,2996142	95,79
Greece	1713,59582	890,59
Grenada	1713,689311	713,81
Guam	..	..
Guatemala	..	..

Guinea	62,67672243	85,37
Guinea-Bissau	36,0207876	5,51
Guyana	590,2430217	273,29
Haiti	63,0478202	16,13
Honduras	295,6205304	139,59
Hong Kong SAR, China	1862,984653	1691,69
Hungary	985,703481	161,38
Iceland	3125,586522	358,27
India	334,1683407	281,71
Indonesia	512,5799827	271,81
Iran, Islamic Rep.	339,1219314	136,11
Iraq	533,9748201	132,17
Ireland	2208,614535	604,95
Israel	2348,424495	1220,42
Italy	1972,709001	435,81
Jamaica	849,0689534	433,04
Japan	1654,402095	523,55
Jordan	673,0599884	215,25
Kazakhstan	1131,238734	1327,62
Kenya	174,4865338	126,25
Kiribati	..	..
Korea, Rep.	1479,526934	480,80
Kosovo	..	..
Kuwait	1073,018201	337,47
Kyrgyzstan	265,5602451	246,21
Lao PDR	109,5082455	6,57
Latin America & Caribbean (ICP)	959,9872573	445,41
Latvia	1170,977916	341,39
Lebanon	..	..
Lesotho	69,46809006	36,11
Liberia	17,41348029	18,27
Libya	..	..
Lithuania	1731,705486	223,33
Luxembourg	4669,029352	272,79
Macao SAR, China	..	..
Madagascar	21,13169038	30,97
Malawi	30,85398835	24,88
Malaysia	1238,051606	236,76
Maldives	266,4215351	227,87
Mali	144,9071182	96,15
Malta	1651,70368	480,18
Marshall Islands	..	..

Mauritania	66,24100414	61,90
Mauritius	1255,713268	420,30
Mexico	1469,796825	641,04
Micronesia, Federated States of	..	..
Middle East & North Africa (ICP)	761,8388465	349,24
Moldova	431,8574251	294,83
Mongolia	360,4923944	172,34
Montenegro	828,4385625	165,59
Montserrat	2044,41332	840,17
Morocco	373,637932	175,53
Mozambique	46,76453215	44,61
Myanmar	48,12664819	39,18
Namibia	697,4792703	118,10
Nauru	..	..
Nepal	28,10608345	13,07
Netherlands	1802,308535	302,08
New Caledonia	..	..
New Zealand	2447,856826	780,53
Nicaragua	360,6800621	233,52
Niger	31,2002909	27,42
Nigeria	137,1664096	106,46
Niue	..	..
North America (ICP)	3802,456827	450,76
North Macedonia	415,4776959	216,32
Northern Mariana Islands	..	..
Norway	2697,573395	628,03
Oman	1906,573006	163,71
Pakistan	128,0197731	61,34
Palau	..	..
Panama	2244,435332	1422,78
Papua New Guinea	..	..
Paraguay	571,6978168	422,60
Peru	863,8399917	818,81
Philippines	390,3782067	328,34
Poland	1152,870795	156,00
Portugal	1741,842059	237,42
Puerto Rico	..	..
Qatar	3878,160545	1960,38
Romania	892,5398467	360,94
Russian Federation	952,0550036	353,11
Rwanda	69,5395169	47,90

Samoa	..	..
San Marino	..	..
São Tomé and Príncipe	183,5094624	144,69
Saudi Arabia	1773,311007	148,56
Senegal	72,5489084	65,36
Serbia	584,0284786	139,35
Seychelles	936,7962461	956,70
Sierra Leone	47,3400498	18,99
Singapore	2196,843332	1591,57
Sint Maarten	2099,916247	412,27
Slovakia	679,7084866	236,95
Slovenia	1979,089088	119,78
Solomon Islands	..	..
Somalia	..	..
South Africa	563,4280838	145,46
South Asia (ICP)	287,4499279	241,86
South Sudan	..	..
Spain	1990,936122	341,84
Sri Lanka	808,5062066	823,01
St. Kitts and Nevis	1061,20071	307,01
St. Lucia	635,0166019	251,75
St. Vincent and the Grenadines	983,6051551	679,39
Sub-Saharan Africa (ICP)	126,4808329	89,64
Sudan	243,2391275	228,69
Suriname	483,168296	115,83
Sweden	1995,140858	471,57
Switzerland	2521,889202	626,60
Syrian Arab Republic	..	..
Taiwan, China	2013,613825	587,19

Tajikistan	75,17948641	103,35
Tanzania	93,46544817	83,85
Thailand	674,9679562	283,26
Timor-Leste	..	..
Togo	52,51304281	32,61
Tokelau	..	..
Tonga	..	..
Trinidad and Tobago	2102,615093	1107,30
Tunisia	838,1242756	230,81
Turkey	1121,737214	775,07
Turkmenistan	..	..
Turks and Caicos Islands	2071,414278	924,76
Tuvalu	..	..
Uganda	37,89348061	33,15
Ukraine	278,6974078	127,65
United Arab Emirates	1855,309381	270,91
United Kingdom	2531,911522	577,43
United States	3841,56572	466,23
Uruguay	796,8380915	383,24
Uzbekistan	..	..
Vanuatu	..	..
Venezuela, RB	..	..
Vietnam	288,8365234	74,92
Virgin Islands, British	2761,202228	1139,10
Wallis and Futuna	..	..
West Bank and Gaza	370,1755333	215,57
WORLD	771,6034799	254,14
Yemen	..	..
Zambia	105,5406756	51,45
Zimbabwe	72,28937802	57,50

Annex VI: Tables of Calculations for Corrected HDI

	Data				Answers				
	Life expectancy at birth (years)	Mean years of schooling for ages 25 and above (years)	Expected years of schooling (years)	GNI per capita (PPP US\$)	Life expectancy index	Education index	GNI index	Human development index (HDI) value	
Switzerland	83,8	13,4	16,3	62.004	1,003	0,900	0,971254816	0,957	1
Norway	82,4	12,9	18,1	59.992	0,960	0,930	0,966272892	0,952	2
Ireland	82,3	12,7	18,7	63.279	0,959	0,922	0,974330248	0,951	3
Hong Kong, China (SAR)	84,9	12,3	16,9	61.565	0,998	0,880	0,9701821	0,948	4
Sweden	82,8	12,5	19,5	47.583	0,988	0,918	0,93126629	0,945	5
Liechtenstein	80,7	12,5	14,9	125.947					
					0,933	0,832	1,078302641	0,943	6
Singapore	83,6	11,6	16,4	81.407	0,979	0,844	1,012382487	0,942	7
Iceland	83,0	12,8	19,1	47.720	0,969	0,926	0,931701428	0,942	8
Germany	81,3	14,2	17,0	49.278	0,944	0,943	0,936556108	0,941	9
Netherlands	82,3	12,4	18,5	52.335	0,958	0,914	0,945647375	0,939	10
Finland	81,9	12,8	19,4	42.183	0,974	0,927	0,913071819	0,938	11
Australia	83,4	12,7	22,0	42.491	0,976	0,924	0,9141725	0,938	12
Denmark	80,9	12,6	18,9	52.729	0,937	0,920	0,946778396	0,935	13
New Zealand	82,3	12,8	18,8	35.351	0,980	0,926	0,886381287	0,930	14
United Kingdom	81,3	13,2	17,5	40.597	0,943	0,927	0,907284765	0,926	15
Belgium	81,6	12,1	19,8	46.546	0,948	0,902	0,927938477	0,926	16
Canada	82,4	13,4	16,2	42.007	0,960	0,894	0,912441688	0,922	17
Korea (Republic of)	83,0	12,2	16,5	41.624	0,992	0,865	0,911056028	0,921	18

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United States	78,9	13,4	16,3	55.400	0,906	0,900	0,954244088	0,920	19
Israel	83,0	13,0	16,2	34.656	0,991	0,883	0,883384276	0,918	20
Austria	81,5	12,5	16,1	49.362	0,947	0,865	0,9368127	0,916	21
Luxembourg	82,3	12,3	14,3	65.877	0,958	0,806	0,980407579	0,911	22
Slovenia	81,3	12,7	17,6	33.631	0,943	0,910	0,87884559	0,910	23
Japan	84,6	12,9	15,2	35.823	0,994	0,851	0,888386981	0,909	24
Czechia	79,4	12,7	16,8	33.023	0,934	0,890	0,876093676	0,900	25
Spain	83,6	10,3	17,6	35.778	0,978	0,831	0,888197401	0,897	26
France	82,7	11,5	15,6	40.997	0,964	0,817	0,908762713	0,895	27
United Arab Emirates	78,0	12,1	14,3	58.752	0,912	0,802	0,963117325	0,890	28
Malta	82,5	11,3	16,1	35.516	0,962	0,825	0,887087022	0,890	29
Estonia	78,8	13,1	16,0	31.860	0,904	0,882	0,870676676	0,885	30
Italy	83,5	10,4	16,1	36.476	0,977	0,793	0,891115055	0,884	31
Cyprus	81,0	12,2	15,2	32.481	0,938	0,827	0,873592593	0,878	32
Poland	78,7	12,5	16,3	26.129	0,924	0,869	0,840720956	0,877	33
Greece	82,2	10,6	17,9	24.024	0,958	0,849	0,828033428	0,876	34
Lithuania	75,9	13,1	16,6	30.936	0,860	0,898	0,866228789	0,875	35
Andorra	81,9	10,5	13,3	50.915	0,952	0,720	0,94149218	0,864	36
Slovakia	77,5	12,7	14,5	27.078	0,905	0,826	0,846111548	0,858	37
Latvia	75,3	13,0	16,2	25.734	0,851	0,883	0,838422143	0,857	38
Portugal	82,1	9,3	16,5	29.539	0,955	0,768	0,859251895	0,857	39
Qatar	80,2	9,7	12,0	85.116	0,927	0,659	1,019113131	0,854	40
Chile	80,2	10,6	16,4	20.235	0,947	0,810	0,80210838	0,850	41
Hungary	76,9	12,0	15,2	27.296	0,875	0,821	0,847318592	0,848	42
Bahrain	77,3	9,5	16,3	36.282	0,881	0,769	0,890306495	0,845	43
Saudi Arabia	75,1	10,2	16,1	37.397	0,848	0,789	0,894881627	0,843	44
Brunei Darussalam	75,9	9,1	14,3	59.739	0,879	0,702	0,965635344	0,842	45
Croatia	78,5	11,4	15,2	23.041	0,900	0,805	0,82172523	0,841	46

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Argentina	76,7	10,9	17,7	18.315	0,872	0,855	0,787050119	0,837	47
Palau	73,9	12,5	15,8	17.049	0,830	0,855	0,776230734	0,820	48
Montenegro	76,9	11,6	15,0	17.823	0,875	0,803	0,782931469	0,819	49
Kazakhstan	73,6	11,9	15,6	18.069	0,843	0,830	0,785000793	0,819	50
Romania	76,1	11,1	14,3	24.644	0,862	0,765	0,831880969	0,819	51
Russian Federation	72,6	12,2	15,0	22.508	0,809	0,823	0,818186164	0,817	52
Turkey	77,7	8,1	16,6	23.301	0,888	0,731	0,823417066	0,812	53
Belarus	74,8	12,3	15,4	14.956	0,843	0,838	0,756439675	0,811	54
Bahamas	73,9	11,4	12,9	31.480	0,830	0,740	0,868861734	0,811	55
Uruguay	77,9	8,9	16,8	15.199	0,911	0,765	0,758877945	0,809	56
Malaysia	76,2	10,4	13,7	23.250	0,883	0,726	0,823088471	0,808	57
Bulgaria	75,1	11,4	14,4	19.050	0,847	0,779	0,792987935	0,806	58
Oman	77,9	9,7	14,2	22.108	0,890	0,718	0,815475418	0,805	59
Kuwait	75,5	7,3	14,2	52.315	0,854	0,638	0,945587956	0,802	60
Panama	78,5	10,2	12,9	22.342	0,900	0,700	0,817071241	0,801	61
Costa Rica	80,3	8,7	15,7	14.669	0,927	0,726	0,753517064	0,798	62
Serbia	76,0	11,2	14,7	13.556	0,862	0,783	0,741599893	0,794	63
Georgia	73,8	13,1	15,3	11.398	0,827	0,862	0,715406843	0,799	64
Albania	78,6	10,1	14,7	12.128	0,901	0,746	0,724780228	0,787	65
Seychelles	73,4	10,0	14,1	19.001	0,840	0,726	0,792598127	0,785	66
Mauritius	75,0	9,5	15,1	15.991	0,846	0,736	0,766545331	0,782	67
Barbados	79,2	10,6	15,4	7.117	0,931	0,782	0,644266412	0,777	68
Mexico	75,1	8,8	14,8	16.024	0,866	0,703	0,766859261	0,776	69
Saint Kitts and Nevis	74,8	8,7	13,8	22.241	0,842	0,673	0,816383557	0,774	70
Peru	76,7	9,7	15,0	10.352	0,893	0,740	0,700865832	0,773	71
Trinidad and Tobago	73,5	11,0	13,0	16.146	0,823	0,728	0,768004414	0,772	72
Ukraine	72,1	11,4	15,1	11.373	0,801	0,799	0,715069842	0,771	73
Thailand	77,2	7,9	15,0	15.589	0,879	0,682	0,762698997	0,770	74

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Sri Lanka	77,0	10,6	14,1	10.062	0,877	0,746	0,696572084	0,770	75
Bosnia and Herzegovina	77,4	9,8	13,8	11.792	0,883	0,711	0,720542947	0,768	76
Antigua and Barbuda	77,0	9,3	12,8	16.633	0,877	0,665	0,772493542	0,767	77
Iran (Islamic Republic of)	76,7	10,3	14,8	8.047	0,892	0,756	0,662810758	0,765	78
Colombia	77,3	8,5	14,4	11.872	0,901	0,682	0,72155653	0,763	79
North Macedonia	75,8	9,8	13,6	12.745	0,858	0,704	0,732273728	0,762	80
Armenia	75,1	11,3	13,1	10.293	0,848	0,740	0,700003838	0,760	81
Cuba	78,8	11,8	14,3	5.824	0,905	0,790	0,613980291	0,760	82
China	76,9	8,1	14,0	14.323	0,876	0,657	0,749906532	0,756	83
Kyrgyzstan	71,5	11,1	13,0	4.248	0,792	0,730	0,566302291	0,689	84
Brazil	75,9	8,0	15,4	11.755	0,860	0,694	0,720062303	0,755	85
Saint Lucia	76,2	8,5	14,0	11.819	0,884	0,672	0,720882056	0,754	86
Grenada	72,4	9,0	16,9	8.511	0,806	0,770	0,67128784	0,747	87
Ecuador	77,0	8,9	14,6	8.612	0,877	0,702	0,673057136	0,746	88
Algeria	76,9	8,0	14,6	9.403	0,895	0,672	0,686341907	0,744	89
Azerbaijan	73,0	10,6	12,9	11.120	0,816	0,711	0,71167267	0,744	90
Maldives	78,9	7,0	12,2	15.469	0,927	0,573	0,76153595	0,739	91
Dominican Republic	74,1	8,1	14,2	12.414	0,832	0,666	0,728307236	0,739	92
Mongolia	69,9	10,3	14,2	9.288	0,784	0,736	0,68447683	0,734	93
Fiji	67,4	10,9	14,4	10.847	0,730	0,764	0,707922362	0,734	94
Botswana	69,6	9,6	12,8	15.118	0,763	0,676	0,758068074	0,731	95
Lebanon	78,9	8,7	11,3	10.255	0,907	0,604	0,699435625	0,726	96
Suriname	71,7	9,3	13,2	11.129	0,795	0,675	0,711799399	0,726	97
Moldova (Republic of)	71,9	11,7	11,5	8.579	0,798	0,711	0,672477137	0,725	98
Saint Vincent and the Grenadines	72,5	8,8	14,1	9.581	0,808	0,684	0,689172741	0,725	99
Jamaica	74,5	9,7	13,1	7.297	0,838	0,689	0,648037698	0,721	100
Paraguay	74,3	8,5	12,7	9.417	0,853	0,638	0,686566473	0,720	101
Tunisia	76,7	7,2	15,1	7.237	0,872	0,661	0,646796976	0,720	102

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Dominica	78,2	8,1	13,0	7.460	0,896	0,632	0,651380384	0,717	103
Indonesia	71,7	8,2	13,6	9.672	0,796	0,650	0,690594604	0,710	104
Libya	72,9	7,6	12,9	11.288	0,814	0,610	0,713936065	0,708	105
Jordan	74,5	10,5	11,4	6.627	0,839	0,667	0,633480014	0,708	106
Philippines	71,2	9,4	13,1	7.972	0,788	0,678	0,661406936	0,707	107
Gabon	66,5	8,7	13,0	12.533	0,731	0,650	0,729745817	0,703	108
Bolivia (Plurinational State of)	71,5	9,0	14,2	5.757	0,810	0,695	0,612234266	0,701	109
Tonga	70,9	11,2	14,4	4.097	0,783	0,775	0,56084853	0,698	110
South Africa	64,1	10,2	13,8	9.356	0,679	0,724	0,685584	0,696	111
Turkmenistan	68,2	10,3	11,2	9.824	0,741	0,653	0,69294888	0,695	112
Samoa	73,3	10,8	12,7	4.041	0,839	0,713	0,558772402	0,694	113
Viet Nam	75,4	8,3	12,7	6.013	0,852	0,630	0,618796434	0,693	114
Belize	74,6	9,9	13,1	4.172	0,840	0,695	0,563600155	0,690	115
Egypt	72,0	7,4	13,3	7.066	0,800	0,618	0,643182418	0,683	116
Venezuela (Bolivarian Republic of)	72,1	10,3	12,8	4.248	0,801	0,700	0,566314802	0,682	117
Morocco	76,7	5,6	13,7	5.652	0,872	0,569	0,609456939	0,671	118
Guyana	69,9	8,5	11,4	6.663	0,768	0,601	0,634303338	0,664	119
Iraq	70,6	7,3	11,3	7.556	0,796	0,557	0,653312696	0,662	120
El Salvador	73,3	6,9	11,7	6.454	0,820	0,555	0,629499532	0,659	121
Marshall Islands	74,1	10,9	12,4	2.242	0,832	0,707	0,469807018	0,651	122
Guatemala	74,3	6,6	10,8	5.697	0,854	0,519	0,610659731	0,647	123
Bhutan	71,8	4,1	13,0	8.663	0,797	0,496	0,673962018	0,644	124
Uzbekistan	71,7	11,8	12,1	2.057	0,796	0,729	0,456758531	0,642	125
Palestine, State of	74,1	9,2	13,4	2.017	0,850	0,678	0,453837895	0,640	126
Nicaragua	74,5	6,9	12,3	3.658	0,838	0,573	0,543709625	0,639	127
India	69,7	6,5	12,2	5.312	0,781	0,555	0,600065184	0,638	128
Tajikistan	71,1	10,7	11,7	2.368	0,786	0,682	0,478047118	0,635	129
Cabo Verde	73,0	6,3	12,7	3.663	0,815	0,562	0,543942405	0,629	130

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Namibia	63,7	7,0	12,6	5.869	0,672	0,584	0,615144966	0,623	131
Honduras	75,3	6,6	10,1	3.912	0,850	0,499	0,553881627	0,617	132
Bangladesh	72,6	6,2	11,6	3.747	0,809	0,529	0,547340498	0,617	133
Ghana	64,1	7,3	11,5	4.678	0,693	0,563	0,580873979	0,610	134
Lao People's Democratic Republic	67,9	5,3	11,0	6.516	0,737	0,481	0,630925914	0,607	135
Micronesia (Federated States of)	67,9	7,8	11,5	3.085	0,737	0,581	0,517988237	0,605	136
Eswatini (Kingdom of)	60,2	6,9	11,8	7.021	0,618	0,557	0,642217859	0,605	137
Kenya	66,7	6,6	11,3	3.558	0,735	0,534	0,539530854	0,596	138
Nepal	70,8	5,0	12,8	2.604	0,781	0,521	0,492394044	0,585	139
Kiribati	68,4	8,0	11,8	1.992	0,744	0,594	0,451934445	0,585	140
Equatorial Guinea	58,7	5,9	9,7	10.399	0,596	0,467	0,701544845	0,580	141
Cambodia	69,8	5,0	11,5	3.171	0,766	0,484	0,522130989	0,579	142
Sao Tome and Principe	70,4	6,4	12,7	2.040	0,793	0,567	0,455492668	0,589	143
Myanmar	67,1	5,0	10,7	3.841	0,741	0,464	0,551084317	0,575	144
Timor-Leste	69,5	4,8	12,6	2.173	0,762	0,510	0,465051168	0,565	145
Zambia	63,9	7,2	11,5	2.362	0,675	0,557	0,477630751	0,564	146
Angola	61,2	5,2	11,8	4.132	0,633	0,500	0,562128361	0,562	147
Afghanistan	64,8	3,9	10,2	1.058	0,690	0,414	0,35627241	0,467	148
Congo	64,6	6,5	11,7	1.981	0,686	0,543	0,451111362	0,552	149
Syrian Arab Republic	72,7	5,1	8,9	2.095	0,811	0,416	0,459543578	0,537	150
Papua New Guinea	64,5	4,7	10,2	810	0,700	0,439	0,31592366	0,459	151
Cameroon	59,3	6,3	12,1	2.509	0,604	0,547	0,486794332	0,544	152
Zimbabwe	61,5	8,5	11,0	1.715	0,638	0,587	0,429293242	0,544	153
Mauritania	64,9	4,7	8,6	4.377	0,691	0,396	0,570840178	0,539	154
Solomon Islands	73,0	5,7	10,2	1.356	0,834	0,474	0,393771831	0,538	155
Pakistan	67,3	5,2	8,3	3.235	0,727	0,402	0,525151629	0,535	156
Benin	61,8	3,8	12,6	2.640	0,643	0,478	0,494460872	0,534	157
Nigeria	54,7	6,7	10,0	4.076	0,534	0,499	0,56008024	0,530	158

HUMAN DEVELOPMENT INDEX AS A GOOD POLICY INDEX

Côte d'Ivoire	57,8	5,3	10,0	4.177	0,581	0,453	0,563753341	0,529	159
Congo (Democratic Republic of the)	60,7	6,8	9,7	444	0,640	0,496	0,225272043	0,415	160
Comoros	64,3	5,1	11,2	1.797	0,682	0,482	0,436346218	0,523	161
Tanzania (United Republic of)	65,5	6,1	8,1	674	0,715	0,429	0,288195493	0,445	162
Rwanda	69,0	4,4	11,2	1.488	0,754	0,458	0,407895904	0,520	163
Vanuatu	70,5	7,1	11,7	837	0,776	0,561	0,320994514	0,519	164
Uganda	63,4	6,2	11,4	1.231	0,682	0,523	0,379170975	0,513	165
Lesotho	54,3	6,5	11,3	2.330	0,528	0,532	0,4756025	0,511	166
Djibouti	67,1	4,1	6,8	4.031	0,725	0,325	0,558395662	0,509	167
Gambia	62,1	3,9	9,9	459	0,647	0,406	0,230253185	0,393	168
Senegal	67,9	3,2	8,6	2.461	0,738	0,345	0,483865678	0,497	169
Madagascar	67,0	6,1	10,2	981	0,724	0,486	0,344896115	0,495	170
Sudan	65,3	3,8	7,9	2.326	0,713	0,345	0,47536417	0,489	171
Yemen	66,1	3,2	8,8	580	0,726	0,350	0,265581601	0,407	172
Haiti	64,0	5,6	9,7	1.018	0,677	0,456	0,350549878	0,476	173
Guinea-Bissau	58,3	3,6	10,6	1.491	0,590	0,414	0,408174573	0,464	174
Malawi	64,3	4,7	11,2	731	0,681	0,470	0,300442154	0,458	175
Ethiopia	66,6	2,9	8,8	1.334	0,717	0,341	0,391343392	0,457	176
Guinea	61,6	2,8	9,4	1.565	0,640	0,354	0,415485995	0,455	177
Togo	61,0	4,9	12,7	623	0,646	0,517	0,276294656	0,452	178
Burkina Faso	61,6	1,6	9,3	1.690	0,640	0,312	0,427073532	0,440	179
Mozambique	60,9	3,5	10,0	941	0,628	0,395	0,33867627	0,438	180
South Sudan	57,9	4,8	5,3	377	0,582	0,307	0,200622861	0,330	181
Eritrea	66,3	3,9	5,0	770	0,713	0,269	0,308360077	0,390	182
Mali	59,3	2,4	7,5	1.614	0,605	0,286	0,420167154	0,417	183
Sierra Leone	54,7	3,7	10,2	826	0,546	0,406	0,319010711	0,413	184
Liberia	64,1	4,8	9,6	448	0,678	0,426	0,22662016	0,403	185
Chad	54,2	2,5	7,3	1.145	0,539	0,288	0,368264595	0,385	186

HUMAN DEVELOPMENT INDEX AS A GOOD POLICY INDEX

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Niger	62,4	2,1	6,5	871	0,653	0,249	0,32692664	0,376	187
Central African Republic	53,3	4,3	7,6	514	0,512	0,353	0,247303522	0,355	188
Burundi	61,6	3,3	11,1	240	0,640	0,417	0,132513236	0,328	189