Climate Change Adaptation Needs in a Changing Global Health Issues

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Abstract

Global climate change is one of the biggest challenges in this century. Several international efforts and multilateral agreements have been taken to combat climate change. The United Nations Framework Convention on Climate Change and its Paris Agreement provides common objectives and framework for mitigation, adaptation, technology transfer and finance for climate change. These efforts are in line with the common global goals, namely Sustainable Development Goals (SDGs) that are a great opportunity and common language for all to discuss common global problems. SDG-13 Climate Action sets special targets for strengthening adaptation capacity for all, and SDG-3 Global Health and Well-being sets goals on improving the health resilience of societies and individuals. The recent unprecedented global pandemic outbreak, COVID-19 in a short time, shows that both developed and developing countries need to increase their health infrastructure resilience for responding to global risks. The case of COVID-19 has started to provide its lesson learned and adaptation capacity and level of resilience of the world. These lessons learned might be opportunities while combatting climate change. There might be a global action agenda to overcome and prevent any risks, including pandemic diseases and expected impacts of climate change to respond effectively. The aim of this study is to analyze policy coherence, the existence of targets and scopes of international policy frameworks in terms of linkage between climate change adaptation and health resilience. Global efforts such as the Paris Agreement, SDGs, Sendai Framework for Disaster Risk Reduction, New Urban Agenda (Habitat III), Addis Ababa Action Agenda will be evaluated for better understanding this linkage. These global actions and their frameworks for specific adaptation needs in health issues will provide a guide to all while preparing any risk reduction action plan at the global level.

Keywords: climate change adaptation, health resilience, risk reduction

Introduction

The Year of 2015 was a critical milestone for sustainable development, climate change, disaster risk management, financing for development, cooperation, and global human society (Sachs, 2015; Ari, 2017; Sachs *et al.*, 2019). Before that year, global societies have shown impressive efforts to overcome global challenges. Some of these challenges are global climate change, disasters and their risk, increasing urbanization rate with social, environmental and economic problems, and insufficient progress and improvement for implementation of global development agenda at the local level. Before 2015, the UN and its bodies have started to coordinate and facilitate to produce multilateral agreements, policy frameworks, and documents to recognize these challenges and problems (UN, 2015c). There are mainly five documents for this aim: (i) Transforming Our World: The 2030 Agenda for Sustainable Development, (ii) The Sendai Framework for Disaster Risk Reduction, (iii) The Paris Agreement, (iv) Third International Conference on Financing for Development (Addis Ababa Action Agenda-AAAA) and (v) New Urban Agenda. Among these, the 2030 Agenda, AAAA, the Paris Agreement, and the Sendai Framework were adopted in 2015. After the year of 2015, the Habitat-III was held in 2016. As a result of this Conference, New Urban Agenda (NUA) was adopted. The common goal of these documents and agreements is to achieve sustainable development. Each document has its scope, focus, and mandate to facilitate sustainable development.

However, challenging global issues are continuing to threaten our environment, societies, and economies (Stern, 2007). Global climate change, unsustainable production and consumption patterns, conflicts, poverty, unemployment, food and energy security, education, and health problems are some of these challenges. The UN facilitates to overcome these problems through People-Prosperity-Peace-Partnership-Planet linkages (UN, 2014). Besides, reducing inequalities while trying to increase the level of resilience in developed and developing countries has the utmost importance. While engaging these challenges, unprecedented global health problems, namely COVID-19, started to a new outbreak at the global level (Forster *et al.*, 2020; WHO, 2020a, 2020b). As of 16th of July 2017, the total confirmed cases and number of deaths are 13,338,364 and 579,319, respectively (WHO, 2020c). At the same time, global climate changes continue to show its negative impacts though there is temporary emissions reduction due to the effects of the COVID-19. The world faces some external shocks due to global climate change and COVID-19 (Sachs, 2020). Both problems have global dimensions and global threats for all of us. While the COVID-19 brings mandatory behavioral change and transformative driver in our societies, climate change continues to increase extreme weather problems such as drought, temperature rise, heavy and storming precipitation and breaking global climate equilibrium. World societies, both developed and developing countries, are shocked and unprepared for the negative synergies of climate change and health problems (Klenert *et al.*, 2020). Vulnerable, disadvantages and minor groups are profoundly suffering from the impacts of both climate change and COVID-19.

In the context of the UN policy frameworks and agreements, for combatting emerging health problems particularly COVID-19 as a communicable disease needs sanitary water, health, and safe sheltering and housing conditions, safe and affordable public transportation and secure foods for all (Pritchard *et al.*, 2020). Therefore, it is needed to revisit the global agenda particularly SDGs and SDG-3 "*ensure healthy lives and promote well-being for all at all ages*" and the main framework and documents about climate change and health issues.

The aim of this study is to investigate the linkages between climate change adaptation policies and health issues. The study is based on the UN documents, agreements, and framework on these issues. This study is based on qualitative analysis techniques namely text mining. The contribution of this article is to understand the importance of health issues in climate change discussions and policy-making processes and the impacts of climate change and its risks on health. Finally, this paper can provide new rooms for discussions on enhancing further actions to overcome climate change related health problems.

Materials and Method

In this study, content analysis method is employed. The selected documents to analyze the policy or goal coherence on climate change adaptation needs and health is investigated based on pre-determined keywords or codes. These keywords and codes depend on the elements of these documents (Onwuegbuzie, Frels and Hwang, 2016; Wang *et al.*, 2020). For example, mitigation, adaptation, capacity building, finance, cross-cutting codes are listed or classified main elements of climate change policy documents. During the content analysis, paragraphs / sentences related to climate policy elements are coded in the documents. For example, when "mitigation" is selected as a code, phrases or keywords including such as "emissions reduction, emissions mitigation, climate change mitigation, reducing fossil fuels, carbondioxide emissions limitation, etc." are determined under the "mitigation" code. For the health issue, SDG-3 and its targets are identified as the code for health. There are 12 targets under the SDG-3, so 12 codes guide for researching the health issues in selected documents. Among SDG-3 targets, some keywords are preliminarily determined to detect linkage or existence in target documents. For example, SDG-3.8 "3.8 *Achieve universal health coverag*e" refers to "access to health services, infrastructure and facilities, covering universal health needs, general well-being and physically good conditions, safe living standards, etc". Therefore, any of these keywords in documents are listed in SDG-3.8 code.

There are mainly two clustering stages in this study. In the clustering stages, six documents are assessed in terms of climate policy elements and health & well-being targets (Figure 1). Two clusters are determined. The first cluster is based on climate policy text mining and the second cluster focuses on the health targets.
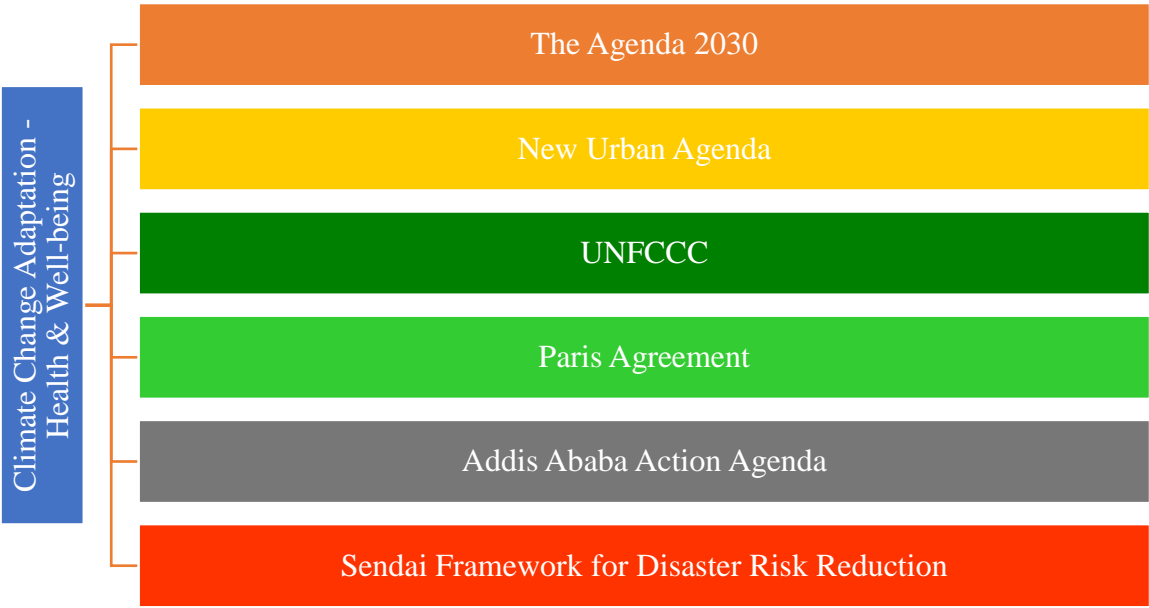

Figure 1. List of the documents for investigation of climate change and health linkages

In the first cluster, the analyzed documents are The 2030 Agenda for Sustainable Development (UN, 2015d), including 17 SDGs and their 243 targets; New Urban Agenda (UN-Habitat, 2017); Addis Ababa Action Agenda (UN, 2015a) and the Sendai Framework for Disaster Risk Reduction (UN, 2015b) (Figure 2). Climate Policy elements such as adaptation, mitigation, technology transfer, capacity building finance, and cross-cutting issues are searched within these targets documents. The UNFCCC (UNFCCC, 1992) and the Paris Agreement (UNFCCC, 2015) are excluded here, because these documents might cause overweighting the climate policy elements analysis.
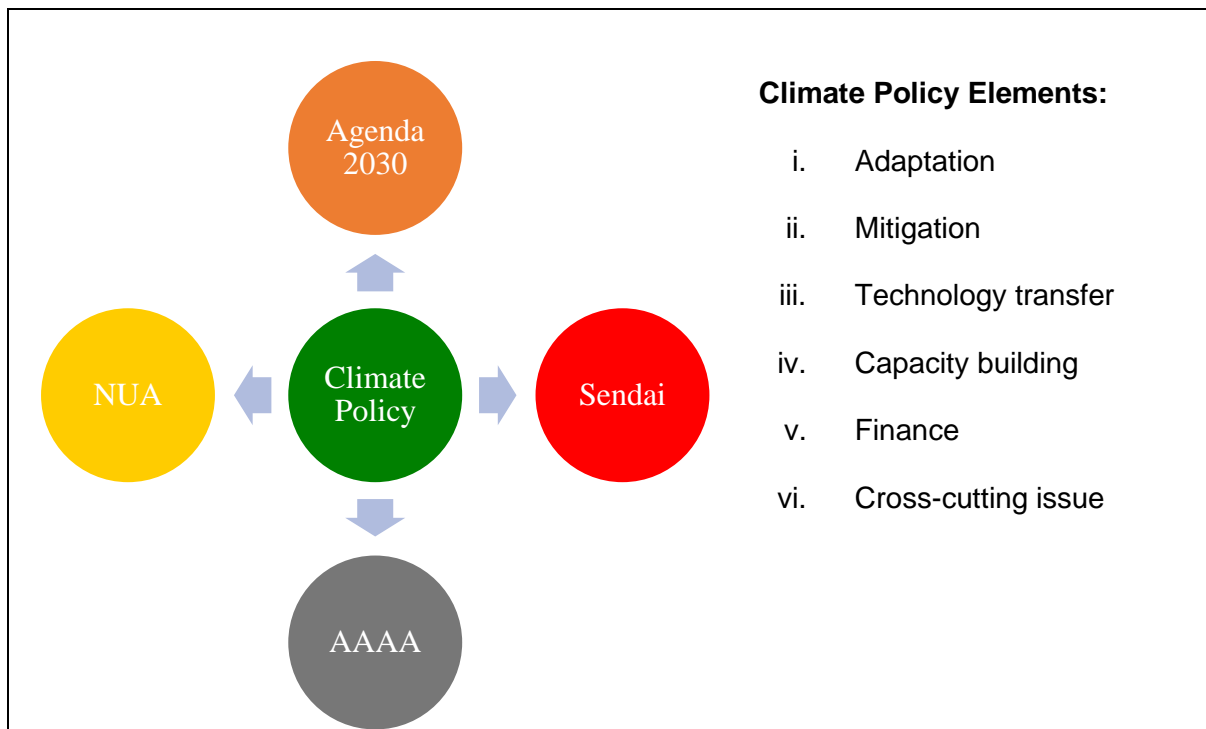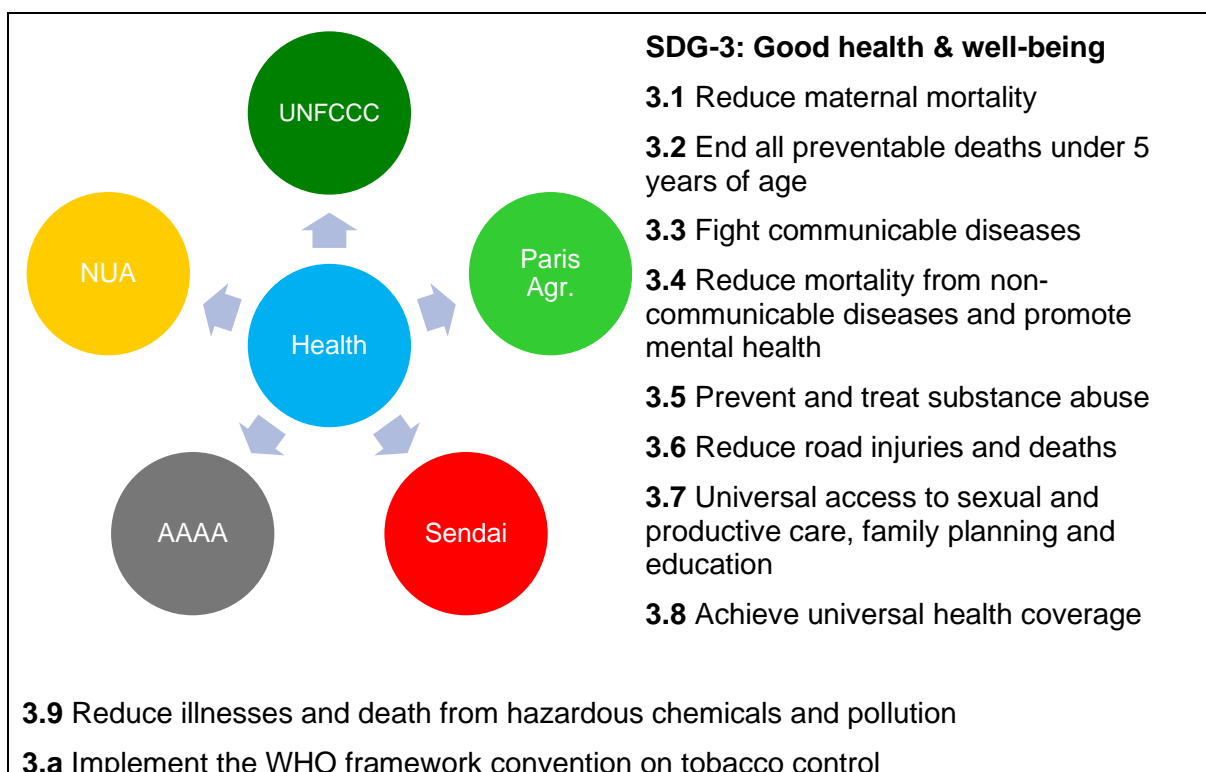
Figure 2. Climate Policy Elements and Analyzed Documents

In the second cluster, health and well-being issues are investigated within the UNFCCC, the Paris Agreement, New Urban Agenda, Addis Ababa Action Agenda, and the Sendai Framework for Disaster Risk Reduction. During the second clustering, the codes and keywords are based on the Agenda 2030 particularly SDG-3. Therefore, this time the Agenda 2030 document is excluded in the second clustering.

SDG-3: Good health & well-being

3.1 Reduce maternal mortality

3.2 End all preventable deaths under 5 years of age

3.3 Fight communicable diseases

3.4 Reduce mortality from non-communicable diseases and promote mental health

3.5 Prevent and treat substance abuse

3.6 Reduce road injuries and deaths

3.7 Universal access to sexual and productive care, family planning and education

3.8 Achieve universal health coverage

3.9 Reduce illnesses and death from hazardous chemicals and pollution

3.a Implement the WHO framework convention on tobacco control

3.b Support RD and universal access to affordable vaccines and medicines
3.c Increase health financing and support health workforece in developing countries
3.d Improve early warning systems for global health risks

Figure 3. SDG-3 targets and Analyzed Documents

Results

Based on the content analysis method, the Agenda 2030, New Urban Agenda, Sendai Framework, the UNFCCC, the Paris Agreement, and Addis Ababa Action Agenda are investigated. According to this analysis, there is no equal distribution of both climate policy elements and SDG-3 targets among all documents. Figure 4 presents the share of the frequency of all climate policy elements according to Figure 2's configuration. Adaptation is the most frequently referred or stated climate policy elements within these documents. This situation provides a valuable opportunity to implement adaptation measures through the other UN frameworks beyond multilateral climate change agreements. The second most frequently a keyword is cross-cutting issues. This is also another opportunity to link adaptation measures with other climate policy elements in other documents.
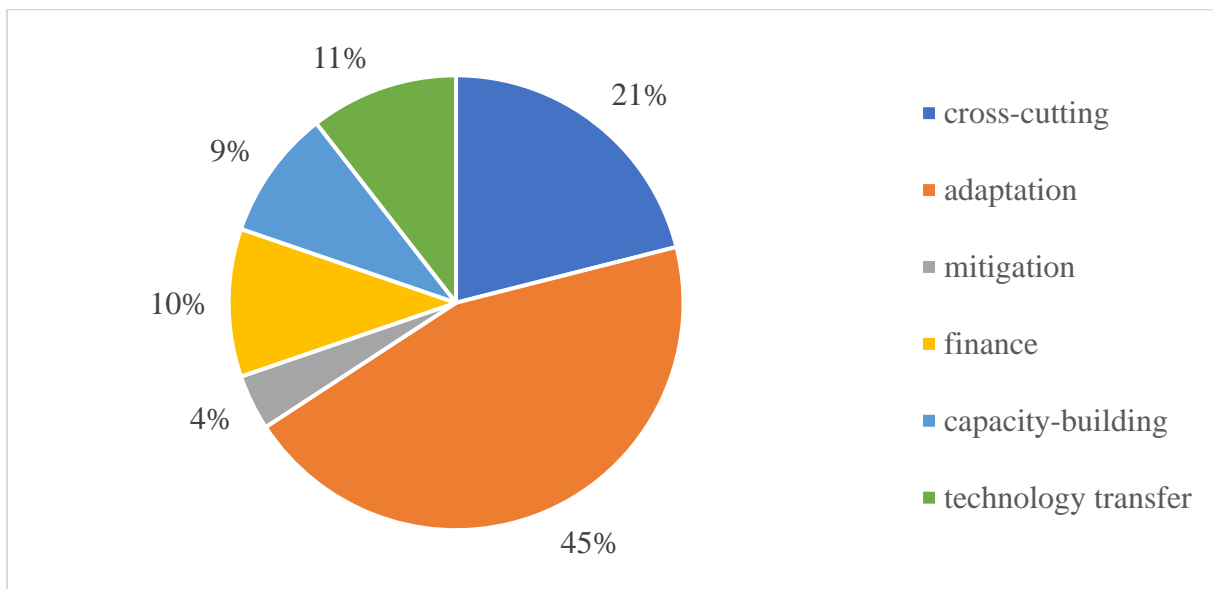

Figure 4. Frequency of climate policy elements as keywords and codes among the UN Documents

Figure 5 shows the distribution of the frequency of SDG-3 and its targets. There are nine operational targets from SDG-3.1 to SDG-3.9 and four means of implementation targets as SDG-3.a, SDG-3.b, SDG-3.c and SDG-3.d. The distribution of SDG-3 and its target is based on the explained configuration in Figure 3. This configuration focuses on related UN documents beyond the Agenda 2030, which is directly referring to all SDGs. SDG -3.8 "*achieve the universal health coverage*" are well ahead. This condition is highly related to the need for accessing basic health services and infrastructure. SDG- 3.d "*improve early warning systems for global health risks*" is a critical target for reducing any climate change related hazards and risks. In terms of current the COVID-19 pandemic, SDG -3.3 "*fight communicable diseases*" has gained importance over secondary or the health problems. It is almost impossible to predict any global epidemic at the COVID-19 level, but several countries and societies have some experience with other pandemics such as Spanish influenza, SARS, MERS, Ebola, swine flu, Zika, and yellow fever, etc (Buheji and Ahmed, 2020). Therefore, the frequency of the SDG-

3.3 that shows the number of highlighting and recognizing the communicable disease is not at the desired level in the UN documents. In this study, linkages between climate change adaption and the COVID-19 are determined through co-occurrences of the "*adaptation*" and "SDG-3.3 *fight communicable diseases.*"
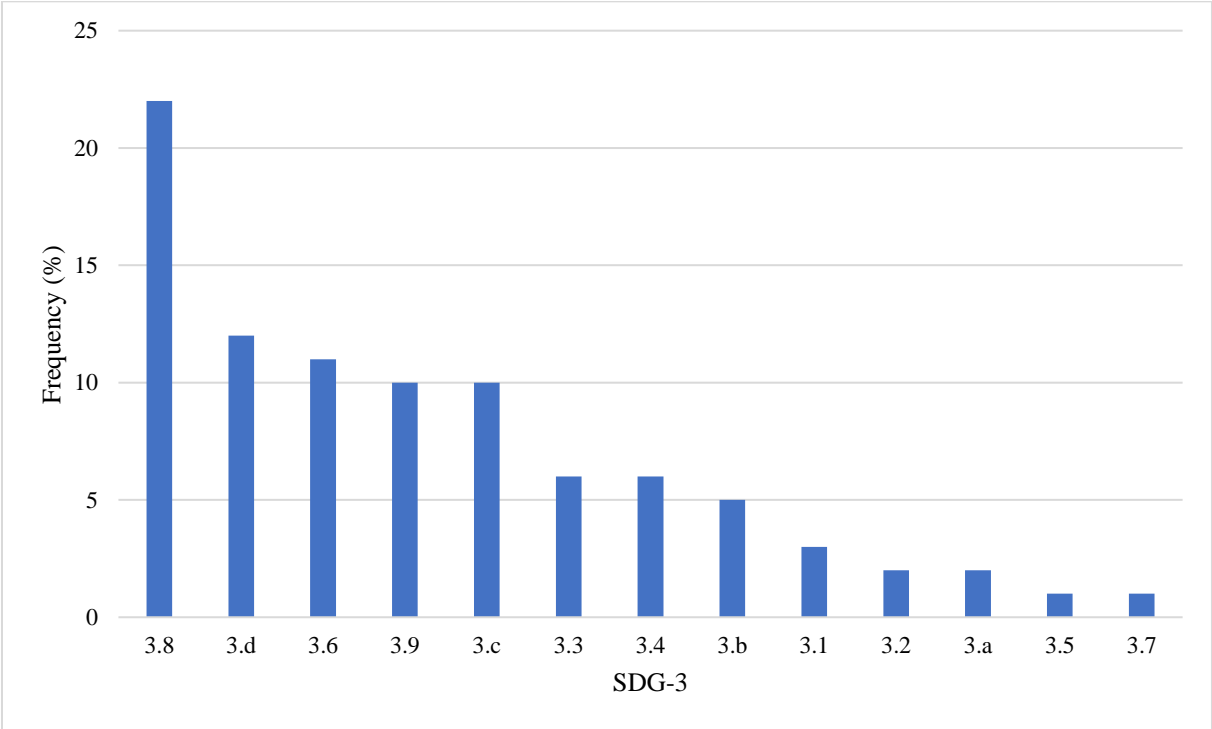

Figure 5. Frequency of SDG-3 as keywords and codes among the UN Documents

Table 1 lists all the coding variables both climate policy elements and SDG-3 targets. To overcome double counting and overweighting, the UNFCCC and the Paris Agreement are not involved in the climate policy investigation. Similarly, the Agenda 2030 is excluded while conducting the SDG-3 analysis. According to this coding frequency analysis, the Agenda 2030, the first document, has mainly provided keywords for cross-cutting and adaptation climate policy elements. The second document is the New Urban Agenda (NUA). Frequency of "adaptation" and SDG-3.6 "Reduce road injuries and deaths" almost equally referred to in the NUA. This frequency number shows that safe, livable, and healthy cities and living places have the utmost importance.

The third document is the Sendai Framework for Disaster Risk Reduction. Adaptation as a keyword is mostly referred to in the Sendai Framework. "SDG-3.8 *Achieve universal health coverage*" and "SDG-3.d *Improve early warning systems for global health risks*" follows the adaptation keywords. Sendai Framework provides a significant linkage between climate adaption needs and health issues. For combatting the COVID-19 pandemic, the existing articles and paragraphs in the Sendai may have shifted towards highlighting and recognizing the SDG-3.3 communicable diseases.

The fourth and fifth documents are the Paris Agreement and the UNFCCC. There is no explicit and directly referring to targets of SDG-3 rather than SDG-3.8 "*Achieve universal health coverage*". Both the Paris Agreement and the UNFCCC need to focus on health issues, particularly the SDG-3.3 and the COVID-19 into during the Conference of Parties meetings, decisions, and implementation plan. The last documents in the Addis Ababa Action Agenda (AAAA). The AAAA is on financing the development, particularly developing countries and least developed countries. The AAAA is directly linked to SDG-17 Means of Implementation targets, particularly the finance sub-section. Therefore, it is not coincidence appearing "*finance*" as climate policy elements and "SDG-3.c *Increase health financing and support the*

health workforce in developing countries". Besides this, both "*adaptation*" and "SDG-3.3 *fight communicable diseases*" have co-occurred in the AAAA.

Table 1: Frequency of codes among the UN documents (%)

	Agenda 2030	NUA	Sendai Framework	Paris Agreement	UNFCCC	AAAA
Climate Policy Elements						
Cross-cutting	35	5	8			4
Adaptation	35	19	24			7
Mitigation	4	2	0			4
Finance	4	3	2			15
Capacity-building	4	3	2			11
Tech. transfer	17	2	2			7
SDG-3 Good health and well-being						
SDG-3.1		2	2	0	0	4
SDG-3.2		2	2	0	0	0
SDG-3.3		7	2	0	0	4
SDG-3.4		5	4	0	0	4
SDG-3.5		2	0	0	0	0
SDG-3.6		18	0	0	0	0
SDG-3.7		2	0	0	0	0
SDG-3.8		11	18	100	100	4
SDG-3.9		13	4	0	0	0
SDG-3.a		2	0	0	0	4
SDG-3.b		0	4	0	0	11
SDG-3.c		3	8	0	0	15
SDG-3.d		2	18	0	0	7

In Table 2(a), it can be seen on the first three lines of the table that the capacity-building, cross-cutting and finance codes co-occur four times with adaptation. It can be seen on lines of "SDG 3.4, 3.3, mitigation, SDG 3.1. 3.d and 3.c" codes co-occur three times with adaptation, while adaptation is found to occur one time each in the absence of "SDG 3.4, 3.3, mitigation, SDG 3.1. 3.d and 3.c.". In Table 2(b), it can be seen on the first four lines of the table that the "SDG 3.1, 3.c, 3.4 and 3.d" codes co-occur three times with SDG 3.3. It can be seen on lines of "capacity-building, adaptation, cross-cutting and finance" codes co-occurs three times with adaptation. However, on one each occasion, these codes are encountered without the presence of SDG 3.3.

Table 2. co-occurrences of keywords among the documents

(a)

TARGET	KEYWORD	CO-OCCURS	DO NOT	IS ABSENT	Jaccard	STRENGTH
adaptation	capacity-building	4	0	0	1,000	••
adaptation	Cross-cutting	4	0	0	1,000	••
adaptation	finance	4	0	0	1,000	••
adaptation	3.4	3	0	1	0,750	•••••••••••••••••••••••••••••••••••
adaptation	3.3	3	0	1	0,750	•••••••••••••••••••••••••••••••••••
adaptation	mitigation	3	0	1	0,750	•••••••••••••••••••••••••••••••••••
adaptation	3.1	3	0	1	0,750	•••••••••••••••••••••••••••••••••••
adaptation	3.d	3	0	1	0,750	•••••••••••••••••••••••••••••••••••
adaptation	3.c	3	0	1	0,750	•••••••••••••••••••••••••••••••••••
adaptation	3.a	2	0	2	0,500	•••••••••••••••••••••••
adaptation	3.b	2	0	2	0,500	•••••••••••••••••••••••
adaptation	3.9	2	0	2	0,500	•••••••••••••••••••••••
adaptation	3.8	3	2	1	0,500	•••••••••••••••••••••••
adaptation	3.2	2	0	2	0,500	•••••••••••••••••••••••
adaptation	3.6	1	0	3	0,250	••••••••••••
adaptation	3.5	1	0	3	0,250	••••••••••••
adaptation	3.7	1	0	3	0,250	••••••••••••

(a)

TARGET	KEYWORD	CO-OCCURS	DO NOT	IS ABSENT	Jaccard	STRENGTH
3.3	3.1	3	0	0	1,000	••
3.3	3.c	3	0	0	1,000	••
3.3	3.4	3	0	0	1,000	••
3.3	3.d	3	0	0	1,000	••
3.3	capacity-building	3	1	0	0,750	•••••••••••••••••••••••••••••••••••
3.3	adaptation	3	1	0	0,750	•••••••••••••••••••••••••••••••••••
3.3	Cross-cutting	3	1	0	0,750	•••••••••••••••••••••••••••••••••••
3.3	finance	3	1	0	0,750	•••••••••••••••••••••••••••••••••••
3.3	3.a	2	0	1	0,667	••••••••••••••••••••••••••••••
3.3	3.b	2	0	1	0,667	••••••••••••••••••••••••••••••
3.3	3.9	2	0	1	0,667	••••••••••••••••••••••••••••••
3.3	3.2	2	0	1	0,667	••••••••••••••••••••••••••••••
3.3	3.8	3	2	0	0,600	•••••••••••••••••••••••••••
3.3	mitigation	2	1	1	0,500	•••••••••••••••••••••••
3.3	3.5	1	0	2	0,333	••••••••••••••••
3.3	3.6	1	0	2	0,333	••••••••••••••••
3.3	3.7	1	0	2	0,333	••••••••••••••••

Finally, Table 3 presents the similarities between the UN documents for occurrences of adaptation climate policies and SDG-3.3 for combatting communicable diseases (as a tracing target for the COVID-19). The UNFCCC and the Paris Agreement are very similar with a 100 percent similarity score. Agenda 2030 is similar to the NUA and the Sendai Framework at 0.663 and 0.725 similarity scores, respectively. The Agenda 2030 has a medium level similarity between the Paris Agreement, the UNFCCC, and AAAA. The NUA is like the other documents except for the AAAA. The Sendai Framework is similar to all analyzed documents. Both the UNFCCC and the Paris Agreement are like the NUA and Sendai Framework, but they have medium level similarity with the AAAA. Finally, the AAAA and the Sendai Framework has high similarity, but it has a medium level of similarity with all other remaining documents.

Table 3. Similarities of the UN documents in terms of Adaptation and SDG-3.3

	Agenda 2030	NUA	Sendai Framework	Paris Agreement	UNFCCC	AAAA
Agenda 2030	1					
NUA	0.663	1				
Sendai Framework	0.725	0.733	1			
Paris Agreement	0.443	0.627	0.718	1		
UNFCCC	0.443	0.627	0.718	1	1	
AAAA	0.561	0.392	0.614	0.461	0.461	1

Conclusion

Climate change is one of the biggest challenges in this century (IPCC, 2018). Both developed and developing countries have been negatively affected but degree of impacts of climate change depends on capabilities, resilience and development level of countries and societies. Adaptation measures including action plans, disaster risk reduction and emergency plans, mitigation plans and recovery plans are essential steps for reducing overall negative impacts . The UNFCCC and the Paris Agreement provide main guidance and give responsibilities to all countries for tackling climate change. Both agreements have adaptation section, articles and policies. Besides, the Agenda 2030, the New Urban Agenda, Addis Ababa Action Agenda for financing development and Sendai Framework for Disaster Risk Reduction have some references adaptation to climate change at various sections. In the Agenda 2030, SDG-13 is directly related to climate action, and other SDGs have indirect linkages in their goals and targets. Moreover, other aforementioned documents or policy frameworks recognize the adaptation needs due to climate change. The UN and its bodies have been trying to facilitate policy coherences climate change adaptation among these documents. However, the unexpected global problems namely COVID-19 has been deeply and negatively affecting all global goals and policy frameworks. While the COVID-19 has been disbursing fast, the global and international societies needs to find way to change negative impacts of this global pandemic (Sachs, 2020).

This study focused on these documents in term of climate change adaptation and COVID-19 interlinkages. SDG -3.3 "fight communicable diseases" can partially represents the COVID-19. In the study, it also noted that COVID-19 is beyond the scope or target of SDG-3.3 and other health targets. The linkage between SDG-3.3 and adaptation policy elements is a starting point to elaborate new discussions and agenda for the near future. When the idea or intention will emerge to revisit or update the SDGs, there should be new targets for pandemic diseases. Further, climate change adaptation section should provide new room for health and pandemic disease.

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