Attention-Attracting Support for Clean Cooking Penetration in Africa

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1. Introduction

In developing countries, traditional biomass, such as firewood, wood chips, and animal dung are often used as cooking fuel in the household sector. This is a serious problem. According to the International Energy Agency (IEA), 60% of young deaths in Africa are related to smoke aspiration and indoor air pollution. A total of 2.3 billion people around the world still use traditional biomass, including about 1 billion people in Africa. This challenge has been recognized in the past, leading to attempts to popularize clean cooking using electricity, liquefied petroleum gas (LPG), biogas, charcoal, etc. In this paper, I would like to confirm that support for the penetration of clean cooking in Africa is attracting renewed attention as indicated by the latest developments regarding the Group of Seven (G7) countries and the IEA. I would also like to review energy sources used for such support considered or implemented for specific African countries based on recent academic papers.

2. Latest Developments Regarding G7 and IEA Support for Clean Cooking Penetration

(1) G7 Leaders' Communiqué[i] and G7 Climate, Energy and Environment Ministers' Meeting Communiqué[ii]

From June 13 to 15, 2024, Italy hosted the annual G7 summit in Puglia. G7 chair Italy, which has been plagued with the social issue of a rapid increase in the number of refugees accepted from sub-Saharan African countries and announced the Mattei Plan for assistance to Africa, took up support for Africa (and artificial intelligence countermeasures) as a main topic for the G7 summit. The G7 Leaders' Communiqué issued on June 14 clearly stated support for clean cooking in Africa as follows:

"We [(G7)] are determined to ensure affordable, reliable, sustainable, clean, and modern energy in developing countries, particularly in Africa, recognizing the opportunity that the clean energy transition presents to spur a new era of productivity, industrial growth, and economic development, and to advance the priority of clean cooking in the [African] continent."

The G7 Climate, Energy, and Environment Ministers' Meeting, which preceded the summit, also issued its communiqué on April 30, committing to contribute to achieving net zero emissions by promoting sustainable energy access, including clean cooking in African and other developing countries.

(2) IEA Summit on Clean Cooking in Africa[iii] and Vision for Clean Cooking Access for All[iv]

Meanwhile, the IEA, which emphasized the importance of clean cooking at the Italy-Africa Summit held in Rome on January 29, 2024, held the Summit on Clean Cooking in Africa in Paris on May 14, between the G7 Summit and the G7 Climate, Energy, and Environment Ministers' Meeting. The main session was co-chaired by the IEA executive director, the president of Tanzania, the prime minister of Norway, and the president of the African Development Bank. IEA Executive Director Faith Birol explained the reason for giving priority to clean cooking in Africa as follows:

"[Clean cooking] was a global problem but it is becoming a problem more and more focused on sub-Saharan Africa. According to our numbers, today, still four out of five families use open fire or basic stoves for preparing a meal, and the fumes and toxins coming from those cooking practices are causing respiratory diseases, especially for women and children. And each year, more than 500,000 people, mainly women and children, die prematurely because of respiratory diseases because of these cooking practices. For us, for IEA, I am sure for all of you, this is not acceptable. This is not acceptable today in this century, in the 21st century. And to fix this problem, to solve this problem, you don't need

to discover new technology. You don't need a huge amount of budget. You need good financial resources and the right policies to implement."

At this summit's public sector session, presentations were made by the presidents of African countries such as Sierra Leone and Togo, and dignitaries of international organizations such as the European Commission, the United Nations and U.N. agencies, and the World Health Organization. Presentations were also made by ministers, deputy ministers, and ambassadors from Azerbaijan—host of the 29th Conference of Parties to the United Nations Framework Convention on Climate Change—, France, Denmark, the Netherlands, the United Kingdom, and the United States, a former Chilean president, and others. Developed countries pledged financial assistance. At the private sector session, the Chairman of the Board and CEO of TotalEnergies, the CEO of Vitol, the COO of Eni, the Vice President of Shell, and others pledged investment. Dr. Birol emphasized that the summit alone secured $2.2 billion in new investment and loans.

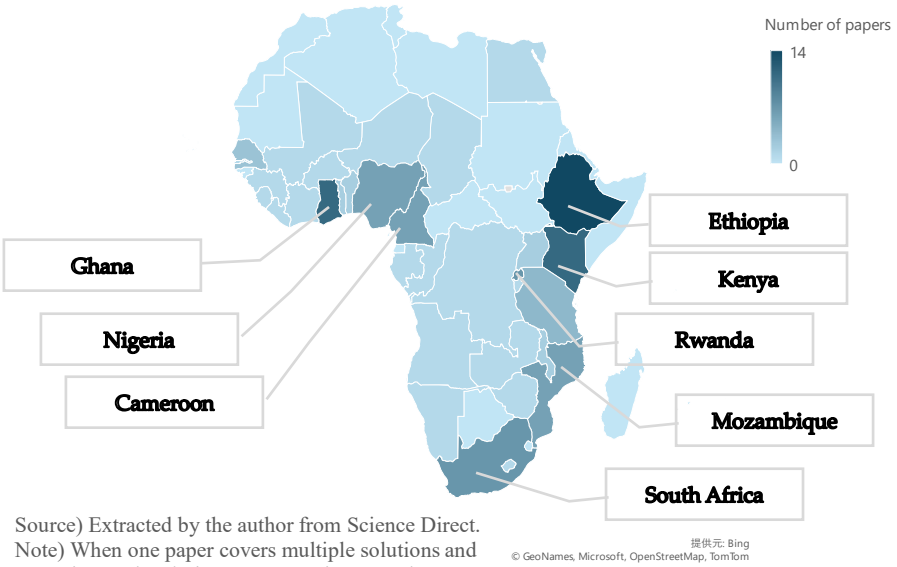
In July 2023, the IEA released "A Vision for Clean Cooking Access for All" as a special report of the "World Energy Outlook 2023" to support the penetration of clean cooking in Africa. As for the reason for assistance required especially for Africa, the IEA noted that the number of people with no access to clean cooking, though falling in Asia and Latin America, was continuing to increase in sub-Saharan African countries as the penetration of clean cooking was failing to catch up with population growth.

3. Recent African Clean Cooking Research in Academia

As shown above, there are industry and government movements to support the penetration of clean cooking in Africa through the G7, IEA, and other organizations. Since resources such as people, goods, and money are required for support, the attitude of entities that can mobilize these resources will determine whether or not the actual support can be provided. On the other hand, it is important to formulate support measures without being (overly) bound by political and business perspectives that tend to accompany aid and cooperation, and to shed light on the penetration of clean cooking in countries that lack attractive resources, markets, or international political power. For this reason, I would like to summarize recent academic papers on how academia in addition to industry and government is considering and implementing support for what countries using what energy sources.[v]

Using the "ScienceDirect"[vi] database, I selected 60 academic papers on clean cooking in African countries among those published since 2021, including the impact of the COVID-19 pandemic.[vii] My analysis of these papers found that many of the academic studies targeted East and West African countries in the sub-Saharan region (Figure 1).[viii]

Figure 1 Number of papers on support for clean cooking penetration (by country)



Source) Extracted by the author from Science Direct.
Note) When one paper covers multiple solutions and countries, each solution or country is counted as one.

Eight countries were each included in five or more papers: Ethiopia (14 papers), Ghana (11), Kenya (11), Rwanda (seven), South Africa (seven), Cameroon (six), Mozambique (six), and Nigeria (six).

Among energy source solutions for support in the eight countries, many papers focused on LPG, electricity, charcoal, biogas, and biochar in that order (Table 1). The order remains unchanged even when all countries in Africa are covered. Papers on other solutions (determinants, etc.) found that household income, householders' education levels, and gender were determinants of cooking energy sources and equipment.

Table 1 Number of papers published in 8 representative countries on support for clean cooking penetration (by country and by energy source for support)

Solution	LPG	Electricity	Charcoal (improved stoves)	Biogas	Biochar	Others (determinants, etc.)	Total
Ethiopia	1	6	3	3	0	1	14
Ghana	7	1	2	0	0	1	11
Kenya	6	0	3	0	0	2	11
Rwanda	5	0	2	0	0	0	7
South Africa	1	2	0	1	0	3	7
Cameroon	4	1	0	1	0	0	6
Mozambique	2	1	1	0	0	2	6
Nigeria	2	1	0	0	0	3	6
Total	28	12	11	5	0	12	68

Source) Extracted by the author from ScienceDirect

Note) When one paper covers multiple solutions and countries, each solution or country is counted as one.
Biochar, though used only in Senegal, is left as a support measure.

4. Features of Solutions to Support Clean Cooking Penetration

The IEA report and academic papers indicate that the current solutions to support clean cooking penetration have the following characteristics:

(1) Regarding the definition of clean cooking, both the IEA and academic papers recognize that clean cooking includes not only cooking equipment that uses solar, wind, and other zero-emission electricity, but also equipment that uses LPG. In addition, especially in rural areas, the use of improved stoves using charcoal as a transitional energy source is included in clean cooking.

(2) As a solution to support clean cooking penetration, the overwhelming majority of the academic papers in 3. above cite LPG. One of the main reasons for this is that solar, wind, and other on/off-grid electricity, though effective for lighting and mobile phone charging applications, is still expensive for cooking applications.

(3) Despite the global trend in which subsidies for fossil fuels are regarded as environmental evils, as well as many European governments and companies participating as clean cooking supporters in the IEA Summit in 2. (2), there is a tendency to endorse LPG subsidies in the household sector in sub-Saharan countries. According to the IEA, this is because the use of LPG has a smaller burden on the environment than methane emissions or deforestation.

5. Conclusion

This paper confirmed that support for the penetration of clean cooking in Africa is attracting much attention, mainly in Europe, as indicated by the latest G7 and IEA trends. It found that the IEA report and academic papers published after the outbreak of the COVID-19 pandemic identify the proactive household use of LPG, especially in sub-Saharan African countries.

Support for the penetration of clean cooking is an extremely important humanitarian challenge. However, it is not difficult to imagine that the support is not only for spreading clean cooking but also

for securing natural gas and critical minerals as well as African business opportunities for developed European countries. For example, natural gas reserves total 200Tcf in Nigeria and 100Tcf in Mozambique.[ix] South Africa accounts for 70% of the global production of platinum, a critical mineral.[x] There is a possibility that new natural mineral resources will be discovered in African countries in the future.

Why don't the Japanese government and companies consider the enhancement of support for clean cooking penetration as an international assistance measure to complement investment and loans that contribute to the economic development of countries in Africa, Asia, Latin America, and other regions? Although it may not be easy to build supply chains in other countries, the support for clean cooking penetration may become a new business opportunity for LPG business operators. At the abovementioned IEA Summit, the IEA sought to "Make 2024 a Turning Point for Clean Cooking."

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[i] https://www.g7italy.it/wp-content/uploads/Apulia-G7-Leaders-Communique.pdf
[ii] https://www.env.go.jp/content/000224818.pdf
[iii] https://www.iea.org/events/summit-on-clean-cooking-in-africa
[iv] https://www.iea.org/reports/a-vision-for-clean-cooking-access-for-all
[v] Academic papers are less politically influenced than grey literature published by multilateral development banks and bilateral development finance institutions. They are generally considered to be more objective because they are published through a peer review process.
[vi] ScienceDirect is a website operated by Dutch publisher Elsevier since March 1997. It provides high-quality peer-reviewed literature on a platform with access to more than 2,200 academic journals and more than 25,000 e-books. (https://www.sciencedirect.com/)
[vii] After extracting 579 papers published from 2021, including the impact of the COVID-19 pandemic, through a keyword search on June 5, 2024, I narrowed them down by title, abstract, and text, selecting 60 academic papers on clean cooking in African countries. I checked only papers that could be viewed free of charge, and read the text of paid papers to the extent that they could be viewed on the web.
[viii] The 60 academic papers consisted of 17 in 2021, 16 in 2022, 17 in 2023, and 10 in 2024 (as of June 5), indicating the possibility of an increase in 2024 and beyond.
[ix] https://oilgas-info.jogmec.go.jp/info_reports/1009226/1009412.html
[x] https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions

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