

# **FINAL REPORT**

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## **NATIONAL VALIDATION WORKSHOP ON FUEL EFFICIENCY LEVELS IN LIBERIA**



**Organized By:**  
**Environmental Protection Agency of Liberia**

**With Support From:**  
**United Nations Environment (UNE)**

**November 20-21, 2017**

**Corina Hotel, Sinkor Monrovia-Liberia**

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## **A. Workshop Overview**

The Environmental Protection Agency of Liberia, in partnership with the United Nations Environment (UNE), organized a two (2) day validation workshop on Fuel Efficiency levels in Liberia. The workshop mainly discussed findings from the baseline survey on Fuel Efficiency for Liberia conducted in 2016. This was a follow up activity under the Global Fuel Efficiency Initiative (GFEI) that aims at promoting cleaner and more fuel efficient vehicles worldwide.

The workshop was held from November 20-21, 2017 at Corina Hotel in Monrovia, Liberia. The workshop brought together participants from government Ministries and agencies, private sector, and tertiary institutions.

Discussion was held about initiatives to promote fuel efficiency and reduce carbon dioxide (Co<sub>2</sub>) emission as well as the negative impacts of inefficient vehicles in Liberia. At the workshop, existing national policies and regulations on fuel efficiency were considered. The proposed policy options for the use of efficient fuel vehicles and other new policies to improve the country's vehicle fuel efficiency were also reviewed and discussed at the workshop.

According to the GFEI report of fuel economy in 2014, the global transport sector accounted for about 25% of the energy related global greenhouse gas emissions. Globally, the transport sector is rising faster than any other sector and the number of vehicles on the planet is set to triple by 2050-the vast majority in non-OECD countries (GFEI, 2014). Thus, promoting fuel efficiency and reducing Carbon dioxide (CO<sub>2</sub>) emissions is a key global development agenda. The GFEI has set a target of 50% improvement in vehicle fuel economy in new LDVs by 2030 and across the total global car stock by 2050 as part of the post-2015 Sustainable Development Goal (SDG) framework.

One way of reducing emissions in Liberia is to further improve efficiency of vehicles, adoption of cleaner fuels such as low sulphur diesel amongst other measures.

## **B. Workshop Objectives**

- Enable all stakeholders/ participants understand the fuel efficiency initiative, status of fuel economy, calculations, International trends and results of the baseline as well as understand their respective roles in the fuel efficiency initiative in Liberia;
- To present, analyse, and discuss the Draft National Policy Option/Framework on national fuel efficiency in Liberia;
- Discuss progress made in the ECOWAS region on Harmonization and implementation of fuel efficiency and how this progress can help accelerate Liberia's plan on reaching fuel efficiency level;
- To introduce shared experiences and best practices on fuel economy efficiency;
- To provide a space for participants to develop increased public awareness on Fuel Efficiency Initiative;
- To ensure that government agencies reinforce the full implementation of existing policies that aims at promoting energy conservation and efficiency;
- To ensure the validation and full implementation therein of the Policy on Liberia's Fuel Economy Initiative.

## **C. Workshop Outputs**

- Stakeholders and participants will understand the fuel efficiency initiative, status of fuel economy, calculations, International trends and results of the baseline as well as their respective roles in the fuel efficiency initiative in Liberia;
- Participants will understand the Draft National Policy Option/Framework on national fuel efficiency in Liberia;
- Participants are able to understand the progress made in the ECOWAS region on harmonization and implementation of fuel efficiency and how this progress can help accelerate Liberia's plan on reaching fuel efficiency level;
- Participants will acquire knowledge from shared experiences and best practices on fuel economy efficiency;
- Participants are prepared to develop increased public awareness on Fuel Efficiency Initiative;
- Government agencies are fully prepared to reinforce the full implementation of existing policies that aims at promoting energy conservation and efficiency;
- The validation and full implementation plan therein of the Policy on Liberia's Fuel Economy Initiative is adopted.



## D. Opening Ceremony

The Opening ceremony commenced with remarks from the ECOWAS Commission, the UN Environment and the Government of Liberia through the Environmental Protection Agency of Liberia.

**Mr. Bernard Koffi**, *Head of Environmental Division at ECOWAS* who represented the ECOWAS Commission at the workshop, thanked the Government of Liberia through the Environmental Protection Agency (EPA) of Liberia for organizing the workshop.



**Bernard Koffi- 3<sup>rd</sup> from Right**

He also thanked the EPA for leading such steps on fuel efficiency levels in Liberia. He admonished participants to make meaningful contributions during the workshop. He also added that the ECOWAS Commission was finalizing a regional work plan for harmonizing fuel economy and promoting cleaner fuels for the ECOWAS region and Liberia as an ECOWAS state will be included.

For her part, **Madam Jane W. Akumu**, *Programme Officer, Air Quality and Mobility Unit Economy Division at the United Nations Environment in Nairobi, Kenya* thanked the Government of Liberia through the EPA for their support in organizing the validation meeting. She informed participants that vehicle growth is becoming huge as the years pass by, therefore emission levels are also increasing. Something she said, needs urgent attention by countries in Africa including Liberia to ensure that fuel efficiency levels are attained and emission levels reduced.



**Madam Jane Akumu- UN Environment Nairobi**

According to her, so far the sub-regional intervention on fuel economy is put at 7 countries including Liberia and this is expected to subsequently increase. Madam Akumu informed the gathering that in Africa, the intervention on vehicle efficiency and cleaner fuels is put at 20 countries thus far. She further mentioned that a regional road map on harmonizing vehicle efficiency and clean fuel is been developed. Finally, Jane Akumu stated that the United Nations Environment (UNE) will continue to work with Liberia on the policy development and expansion on vehicle fuel efficiency.

**Mr. Urias S. Goll**, *Deputy Executive Director* of the Environmental Protection Agency of Liberia in brief remarks thanked the UN Environment family and the ECOWAS Commission for their support on National Fuel Efficiency levels in Liberia and other parts the region and Africa. He noted that the Paris Agreement became the embryonic stage of affording countries the space to find workable solutions towards combating emission levels. According to Mr. Goll, this global commitment then challenged Liberia to join ranks with other countries to lower emission levels.



**Mr. Urias S. Goll, Deputy Executive Director- EPA Liberia**

He additionally mentioned that the Government of Liberia has made frantic efforts in raising tariff on vehicles 10 years older in an attempt to raise revenue which is just an aspect focused on revenue generation. He was however quick to point out that the fuel economy project for Liberia is more or like different because it focuses on ensuring vehicle efficiency levels are increased and cleaner fuels used to reduce emission levels in Liberia is achieved. He concluded by stating that Liberia has taken significant steps towards deriving a Policy option for vehicle fuel efficiency levels in Liberia. Participants were admonished to use the validation workshop to ensure the country gets to the next steps of the ensuring fuel efficiency levels are improved in Liberia. Mr. Goll finally committed the government to work assiduously in reducing CO<sub>2</sub> emission levels.

Later, as a way of participants getting to know each other the workshop afforded participants to introduce themselves and the institutions they represented.

**Mr. Arthur R.M. Becker**, *Administrative Assistant to the Deputy Executive Director of the Environmental Protection Agency of Liberia* gave a brief background of the Global Fuel economy Initiative and the Objectives of the workshop. In his brief presentation, he informed participants that fuel economy always refers to fuel use relative to distance travelled and such calculation is done as CO<sub>2</sub> emissions=CO<sub>2</sub> g/km.



**Mr. Arthur R.M. Becker- Administrative Assistant,  
EPA Liberia**

### **E. Plenary Session( Day 1)**

**Presentation 1. “Calculation of Fuel Consumption and CO<sub>2</sub> Emissions, Methodology and Results: Professor James Nyangaya- Department of Mechanical Engineering, University of Nairobi, Kenya**



**Professor James Nyangaya**

Professor Nyangaya began by thanking the organizers for planning the workshop. He expressed happiness as well to be in Liberia for the validation workshop. Professor Nyangaya’s presentation focused primarily on the following key issues regarding calculation of fuel Consumption and CO<sub>2</sub> emissions methodology and results:

- ❖ Fuel Economy and Consumption levels and tests
- ❖ Steps in Developing Fuel Economy Data Base
- ❖ Standards( European and USA)
- ❖ Approaches and Limitations which considers sales of LDVs
- ❖ Data on Vehicles imported in country (model, year of Manufacture, engine size, Year of Registration, Body type, etc.)
- ❖ Categorize LDVs Fleet and Total Fleet

**Presentation 2. “International Trends towards Cleaner Fuels and Vehicles”- Jane W. Akumu- Programme Officer, Air Quality and Mobility Unit Economy Division at the United Nations Environment in Nairobi, Kenya**

Jane Akumu began by providing summary data on health effects and deaths attributed to outdoor pollution as a result of CO<sub>2</sub> pollutions. The presentation later considered the following regarding International Trends towards Cleaner fuels and vehicles:

- ❖ Particulate Matter( PM) levels of major cities
- ❖ Main sources of PM in Nairobi( Combustion, Mineral Dust, traffic, Industrial or mixed factors)



- ❖ Trend in the population of world trucks and buses
- ❖ Motorization in Africa including Systems approach and clean fuels and vehicles
- ❖ Progress towards unleaded Petrol
- ❖ Progress of leaded Petrol phase out in Sub-Saharan Africa
- ❖ Benefits of lowering sulphur diesel fuels
- ❖ Progress in reducing sulphur diesel fuels and Vehicle emission standards as of June 2017
- ❖ Fuel Standards timeline
- ❖ A systems approach to standards
- ❖ Progress in PM Reduction levels
- ❖ Next steps to Sustainable transport

Presentation 3. *Fiscal Regime on Vehicles (Registration, Taxation, new and second hand vehicles differentiation, and vehicle incentives)*-**Ebenezer Mewon Nyah, Manager/ Policy Research and strategic planning Division (Liberia Revenue Authority (LRA))**

The Liberia Revenue Authority (LRA) wasn't present as planned to make this presentation; but however submitted their presentation which forms a part of this final report. The LRAs presentation considered the following keys:

- ❖ Definition of and causes of emission levels
- ❖ Sulphur dioxide and nitrogen oxide and their effects on Emission levels
- ❖ Classification of Vehicles( New and Used)
- ❖ Used Vehicle Valuation
- ❖ Emission perspective in Vehicle Valuation
- ❖ HS Code Vehicle Valuation under Common External Tariff(CET)
- ❖ Excise tariff rates on vehicles imported in country
- ❖ Review on tax for petroleum products

**Presentation 4. “Key Findings on Vehicle Fuel Efficiency in Liberia”- Johnson S. Willabo, Consultant GFEI Project, EPA Liberia**

Johnson Willabo’s key findings on vehicle fuel efficiency in Liberia in summary revealed the following:

From the data obtained through the LRA and MOT from 2005 to 2015, it is from the variables indicators that are used to guide the analysis of the proposed feebate policy in Liberia. The registry of vehicles for the years 2005, 2008, 2011, 2013 and 2015 provides this informed findings and analysis.

The average fuel economy for Liberia was established to be 7.93L/Km with a corresponding average CO<sub>2</sub> emission of 179.03g/Km. Comparing this with the global average of 7.2L/100Km it is shown that Liberia’s average fuel economy is higher and is not improving.

The significant increase in the number of used vehicle with no record of hybrid vehicle imported in country is an issue of concern. This is unusual. However, it could be attributed to no public awareness on environmental degradation and fuel efficiency issues as is the case with Kenya.

The record of vehicles registered since 2005 and observations made are as follows:

1. During the period under study, 90% of the vehicles were manufactured in Japan and Germany and 10% in the United States of America.
2. The number of used vehicles in the fleet continue to increase. The study established that 89.7% of Vehicles were used and 11.3% were new. The average age of vehicles imported into the country is 10 years old.
3. The total number of LDVs registered in Liberia in 2005, 2008, 2011, 2013, 2015 included 7,440, 17,367, 21,609, 30,832, 32,522 respectively. On the basis of this trend, and based on extrapolation of best line of fit, the total number of Light Duty Vehicles could reach 913,853 by 2050. This also conforms to R. Gakenheimer 1997 study that “in much of the developing world, the number of motor vehicle is increasing at more than 10% per year”.

## **Presentation 5. Plenary Discussions and Wrap of Day**

Mr. Johnson S. Willabo, Jr. Consultant GFEI Project Liberia then summarized by introducing participants to the Feebate Policy that was proposed from the study conducted in-country which considers a market based policy for encouraging reduction of greenhouse gas emissions from the passenger vehicle by levying fees on relatively high emitting vehicles and provides rebates on lower emitting vehicles. In his proposal to participants he also introduced participants to Vehicle Labelling as a policy option. Vehicle labelling provides information on vehicle fuel economy using labels by which consumers consider additional performance characteristics as they make choices in addition to government duties and taxation. He then gave participants the policy options to review which will inform them better to provide recommendations and suggestions that would subsequently lead to the validation of Liberia's policy option on fuel efficiency levels in Liberia.

The Validation workshop was then concluded on Day 1 with participants given a summary count down of Day One proceedings.

**F. Plenary Sessions (Day 2.)** Presentation 1: *Overview of International Policies on Vehicle Fuel Economy*- **Professor James Nyangaya & Madam Jane W. Akumu** provided a summary presentation.

The both facilitators spoke about fuel economy policies and instruments which include:

- ❖ Monetary Fiscal instruments
- ❖ Consumer Information( Labelling)
- ❖ Regulatory( Fuel Economy or CO<sub>2</sub> Emission Standards), Emission Controls and Carbon Tax
- ❖ International Best Practice on Emission Reduction on Road transport
- ❖ Usage of Electric Vehicles

Both presenters also encouraged the usage of the feebate system as well as the system of labelling that can be of great support to reducing fuel emission levels. They also shared experiences where the feebate system has worked. Such countries include Mauritius and Sri Lanka.

Presentation 2. *“Regional Harmonization of Cleaner Fuels and Vehicles”*- **Bernard Koffi, Head of the Environmental Division- ECOWAS Commission**

Bernard Koffi gave a highlight of countries that constitute the ECOWAS region and where the fuel economy project was been implemented. As part of his presentation he touched on the following:

- ❖ ECOWAS Commission is fully involved in the Global Fuel economy initiative and fully supports issues regarding fuels efficiency levels and cleaner vehicles across West Africa;
- ❖ ECOWAS interventions on Better Air Quality and Reduction of Sulphur in Fuel levels across West Africa;
- ❖ Harmonization of standards and specifications for petroleum products as well as regulations related to air quality in the ECOWAS for adoption by the Heads of State;
- ❖ Establishment of a regional organization for the standardization and quality control of petroleum products like the countries of East Africa and South Africa area.

Presentation 3. *“Presentation and Group Discussion on Draft National Policy Options on Fuel Efficiency Levels in Liberia”*- **Johnson S. Willabo, Consultant Global Fuel Economy Initiative Liberia**



Mr. Willabo took time off to provide details for participants on policy options derived in country from the data analysis drawn on vehicle inventory collected. He then separated participants into two groups to analyze the GFEI Policy options recommended for Liberia on Vehicle Fuel Efficiency levels and asked participants to suggest recommendations for Liberia's Fuel Economy levels.

## G. Group Presentations/Recommendations and Way Forward

At the close of workshop Groups 1 and 2 came up with the following Recommendations on the Feebate Policy Options Suggested:

### GROUP 1

Description	Issues	Challenges
Feebate Policy	<p>Yes, the Policy is Timely and Why?</p> <ul style="list-style-type: none"> <li>✓ Provides a road map to reduce CO<sub>2</sub> emission by vehicles</li> <li>✓ GHG is a global environment issues affecting Liberia</li> <li>✓ Legislation to control vehicle importation</li> <li>✓ Regulatory framework</li> </ul>	<ul style="list-style-type: none"> <li>✓ Human Resources capacity</li> <li>✓ Inadequate public awareness</li> <li>✓ Availability of equipment for monitoring</li> <li>✓ High taxation on vehicle</li> </ul>
	<p>Recommendations:</p> <ul style="list-style-type: none"> <li>✓ Current feebate proposed (\$125.00USD) should be reduced to (\$2.00 gCO<sub>2</sub>/km)</li> <li>✓ Incremental feebate when infrastructures are improved</li> <li>✓ Increase import tax on high emission vehicles</li> </ul>	

### GROUP 2

Description	Issues	Challenges
Feebate Policy	<p>Feebate Policy should be encouraged and accepted.</p> <ul style="list-style-type: none"> <li>✓ A timeframe of 5 to 10 years projection for implementation</li> <li>✓ There should be a regulatory body set up comprising: EPA, MOT, LRA, MOJ, LPRC, MOCI, and NPA</li> </ul>	<ul style="list-style-type: none"> <li>✓ Legislation Process</li> <li>✓ Awareness</li> <li>✓ Infrastructural Development</li> </ul>
	<p>Recommendations:</p> <ul style="list-style-type: none"> <li>✓ Vehicles 10 years and above should not be allowed for importation.</li> </ul>	

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|  | <ul style="list-style-type: none"> <li>✓ Regulation should create a policy to ensure clean fuel importation</li> <li>✓ Feebate fees should be the responsibilities of importers</li> </ul> |  |
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## H. Closing Session

The Closing Session was characterized with few remarks including validation of the policy options on fuel efficiency levels for Liberia.

In his closing remarks **Mr. Bernard Koffi** from the ECOWAS Commission, thanked the EPA Liberia family for organizing a successful event on Global Fuel Economy levels in Liberia. He assured participants and the Environmental Protection Agency of Liberia of ECOWAS' continuous commitment to reducing emission levels in West Africa. He ended by stating that ECOWAS encourages the proposals and will add elements to the ECOWAS road map on vehicle efficiency levels.

For her part, **Madam Jane Akumu** of UN Environment in Nairobi, Kenya thanked participants for the 2 days of frank deliberation and exchange. She told participants, she had wondered in 2016 how the data inventory would have been collected; but said that she was now proud that it became a reality come through. Jane admonished participants to continue the discussions and stated that she was impressed about the group discussions that participants contributed to. She was excited that the policy option including feedback from participants considered feebate and labelling. Jane concluded by informing participants that UN Environment will engage Liberia on the next steps of the project with the interventions forthcoming by ECOWAS.

For his part, **Mr. Urias S. Goll-** Deputy Executive Director of the Environmental Protection Agency of Liberia he thanked the UN Environment, ECOWAS, and participants representing various government agencies and Ministries for making the workshop a resounding success. He also took off time to thank the organizing team and the Consultant for the magnificent work done to organize the meeting and derive at the policy options. He stressed that the EPA would take further steps to ensure that the policy option is reaches more actors for its full scale implementation in Liberia. He then opened the policy option for validation. At that point, participants opted to validate the policy option.

**Mrs. Sayetta D. Kpadeh**, a participant then made separate remarks. On behalf of her colleagues, she thanked the Environmental Protection Agency of Liberia and the UN Environment for organizing such a workshop. She opined, that the workshop was an eye opener for her and colleagues.



## I. Annexes

### Annex A.

### Program

<b>Day 1: November 20, 2017  Moderator- Salimatu Lamin Gilayaneh (Environmental Protection Agency of Liberia)</b>		
<b>Time</b>	<b>Activity</b>	<b>Responsible Person</b>
09:00am-09:30 am	Arrival of Participants, Registration, and Break-fast	ALL
09:45 am-10:45 am	Opening Remarks:          Group Photo Session	<ul style="list-style-type: none"> <li>• Liberia Revenue Authority</li> <li>• Ministry Transport</li> <li>• Rural Renewable Energy Agency</li> <li>• ECOWAS Commission</li> <li>• UN Environment</li> <li>• Hon. Urias S. Goll( Deputy Executive Director-EPA)</li> </ul> ALL
10:45am-10:55 am	Getting to Know Each Other	Participants
10:55 am- 11:15 am	Objective of the Workshop & Brief Background of the Global Fuel Economy Initiative	Arthur R.M. Becker, EPA
11:15 am-11:35 am	Calculation of Fuel Consumption and CO2 emissions , Methodology and Results	Prof. James Nyang'aya- Department of Mechanical and Manufacturing Engineering: University of Nairobi, Kenya
11:35 am-12:00 noon	International Trends towards Cleaner Fuels and Vehicles	Jane W. Akumu- UN Environment
12:00pm-12:30 pm	Liberia's Transport Sector: Analysis of regulation on Importation of Light and Heavy Duty Vehicles	Ministry of Transport, Republic of Liberia
12:30 pm-1:00pm	Plenary Discussions	Participants
1:00 pm- 2:00pm	LUNCH	ALL
2:00 pm- 2:20 pm	Fiscal Regime on Vehicles( Registration, taxation, new and second hand vehicles differentiation, and vehicle incentives	Liberia Revenue Authority
2:20 pm-3:00 pm	Key Findings on Vehicle Fuel Efficiency in Liberia	Johnson S. Willabo, Consultant GFEI Project- Liberia
3:00 pm-3:30pm	Coffee Break	ALL
3:30 pm-4:00pm	Plenary Discussions and Wrap Up	Moderator/Participants

<b>Day 2: November 21, 2017: Moderator- Rafael Ngumbu( Environmental Protection Agency of Liberia)</b>		
<b>Time</b>	<b>Activity</b>	<b>Responsible Person</b>
09:00am-09:30 am	Breakfast	ALL
09:30am-09:50 am	An overview of International Policies on Vehicle Fuel Economy	Prof. James Nyang'aya- Department of Mechanical and Manufacturing Engineering: University of Nairobi, Kenya
09:50 am-10:10 am	Regional Harmonisation of Cleaner Fuels and Vehicle Standards	Bernard Koffi ECOWAS Commission
10:10 am-11:00 am	Presentation and Group Discussion on Draft National Policy Options on Fuel Efficiency in Liberia	Facilitator: Johnson S. Willabo-Consultant GFEI along with Participants
11:00 am- 11:30 am	Coffee Break	ALL
11:30 am- 12:30 pm	Group Presentations/Recommendation and Way forward	Groups
12:30 pm-1:15pm	Closing Session	Remarks: <ul style="list-style-type: none"> <li>• Ministry of Transport</li> <li>• Liberia Revenue Authority</li> <li>• UN Environment</li> <li>• EPA</li> </ul>
1:15pm-2:15 pm	LUNCH	ALL
<b>END OF VALIDATION WORKSHOP</b>		

No.	Name	Institution	Position	Mobile/Email
1.	JOSEPH S. JUSTICE	National Port Authority	Assistant Manager	0770571552 <a href="mailto:Justicejoseph615@gmail.com">Justicejoseph615@gmail.com</a>
2.	OBADIAH D. TARLUE	Federation of Road Transport Union	Secretary General	0777330163 <a href="mailto:Obadiahtarlue18@gmail.com">Obadiahtarlue18@gmail.com</a>
3.	PROFESSOR JAMES NYANGAYA	University of Nairobi, Kenya	Engineer	<a href="mailto:janyangaya@gmail.com">janyangaya@gmail.com</a>
4.	JANE W. AKUMU	UN Environment	Program Officer	<a href="mailto:jane.akumu@unep.org">jane.akumu@unep.org</a>
5.	EMMANUEL WEEDEE-CONWAY	Heritage Newspaper	News Editor	0776123656
6.	KOFFI YAO BERNARD	ECOWAS Commission	Head of Environment Division	+2348067529481
7.	JOHNSON S. WILLABO, Jr.	GFEI Liberia	Consultant	0775191393
8.	URIAS A. TAYLOR, JR.	University of Liberia	Instructor Engineering College	0770849405/0886849405 <a href="mailto:urias11@yahoo.com">urias11@yahoo.com</a>
9.	DANISE LOVE DENNIS	EPA	Communication & Media Specialist	0775249430/0886391662 <a href="mailto:ddennis@epa.gov.lr">ddennis@epa.gov.lr</a>
10.	ADAMA A. TULAY	LEL	Fleet Officer	0886743180/0776561165
11.	JOHN C. JEH	EPA	Assistant Manager, ICT	0886520212 <a href="mailto:jjeh@epa.gov.lr">jjeh@epa.gov.lr</a>
12.	PRINCE A. NIMROD	LCAA	Aerodromes Inspector	0776998817
13.	CLAUDE DIONYSIUS EDWIN	EPA/MEAs	Sr. Project Accountant	0770830954
14.	HENRY KENELLY	Liberia Maritime Authority	Junior Marine Environmentalists	0776077390 0888595510
15.	STEPHEN B. LAVALAH	Liberia Maritime Authority	Senior Marine Environmentalists	0886619997
16.	SAYETTA D. KPADEH	Monrovia City Corporation	Director	0886545983
17.	BENJAMIN KARNGA	Liberia Petroleum Refinery Company	HSE Manager	0880845298
18.	TARBAH QUEELYME	EPA		0886337358
19.	ROOSEVELT D. GEELEH, JR.	MFDP	Planning Analyst	0886476402 <a href="mailto:drooseveltgeeleh@gmail.com">drooseveltgeeleh@gmail.com</a>
20.	DAVID L. WILES	Rural Renewable Energy Agency of Liberia	Environmentalist	0886527484
21.	GERALD C. KOINYENEH	FrontPage Africa Newspaper	Reporter	0777769531
22.	HARRIS S. WEAH	EPA		0777099180
23.	Z. ELIJAH WHAPOE	EPA	Manager, Planning & Policy	0886524657
24.	Supt. FRED M. GAYE, JR.	LNP	Chief Traffic Investigator	0770800154
25.	ARTHUR R.M. BECKER	EPA	Administrative Assistant-Deputy Executive Director	0777/0886-556238 <a href="mailto:abecker@epa.gov.lr">abecker@epa.gov.lr</a>
26.	ABRAHAM JUSU GARNEO	Monrovia City Corporation	Director General Services Program	0775263505
27.	TENNEMA M. COLEMAN	EPA	Awareness Officer	0886/0776-530704
28.	SALIMATU GILAYENEH	EPA	Project Coordinator	077758828
29.	JAMES Z. AQUOI	EPA	Finance Officer	0886580113
30.	HASSAN K. JALIEBA	EPA		0888014867
31.	EBENEZER M. NYAH	Liberia Revenue Authority( LRA)	Manager, Policy	0886829505/0776924083

				<a href="mailto:ebenezer.nya@lra.gov.lr">ebenezer.nya@lra.gov.lr</a>
32.	<b>ZECHARIAH MUNFORD</b>	Liberia Revenue Authority	Acting Manager, Trade	0886397297/0776614617 <a href="mailto:zechariah.munford@lra.gov.lr">zechariah.munford@lra.gov.lr</a>
33.	<b>USMAN M. KARNEH</b>	Stella Maris Polytechnic	Chairman Electronics Department	0886397306 <a href="mailto:ansukars@gmail.com">ansukars@gmail.com</a>
34.	<b>JOHN CUFFEY</b>	Liberia Maritime Authority	Director/MEP	0880525608 <a href="mailto:johncuffey@gmail.com">johncuffey@gmail.com</a>
35.	<b>LUWAMAH S. SENESI</b>	SLET	Consultant	0886302571 <a href="mailto:talktosenesi@gmail.com">talktosenesi@gmail.com</a>
36.	<b>JEFFERSON T. CHEA</b>	SLET	Consultant	0886562871 <a href="mailto:jeffcheatm@yahoo.com">jeffcheatm@yahoo.com</a>
37.	<b>GABRIEL L. POTTER, III.</b>	Roberts International Airport/ Liberia Airport Authority	Administrative Assistant	0888935703
38.	<b>ALLOYSIUS DAVID</b>	The News Newspaper	Reporter	0881342218 <a href="mailto:alloyciousdavid@yahoo.com">alloyciousdavid@yahoo.com</a>