TRANSCRIPT OF PROCEEDINGS: NATIONAL INQUIRY ON THE IMPACT OF CLIMATE CHANGE ON THE HUMAN RIGHTS OF THE FILIPINO PEOPLE, AND THE RESPONSIBILITY OF THE "CARBON MAJORS," IF ANY, FIRST HEARING, MARCH 27 TO 28, 2018

ATTY. TRISHA ISABELLE F. FERNANDEZ (CLERK OF THE PANEL):

Good morning, everyone. This public hearing is being held as part of the National Inquiry being conducted by the Commission on the impact of climate change on the human rights of the Filipino people and the responsibility therefore, if any, of the "Carbon Majors." This proceeding stems from a Petition filed before the Commission, docketed as CHR Case No. CHR-NI-2016-0001.

The solemnity of the public hearings shall be upheld at all times. Respect should be accorded to everyone present. The clapping of hands, booing and unnecessary remarks shall not be allowed and may be regarded as direct contempt of the Inquiry Panel.

Cellphones should be turned off or put on silent mode while the proceedings are going on. All rise.

The Commissioners comprising the Inquiry Panel are:

1. Honorable Commissioner Leah C. Tanodra-Armamento
2. Honorable Commissioner Gwendolyn Ll. Pimentel-Gana
3. Inquiry Panel Chairman of the NICC, Honorable Commissioner Roberto Eugenio T. Cadiz
4. Honorable Commissioner Karen S. Gomez-Dumpit
5. Chair of the Commission on Human Rights, Honorable Jose Luis Martin C. Gascon

Please remain standing for the national anthem.

[National anthem]

Everyone may now be seated. The Honorable Jose Luis Martin C. Gascon, Chairman of the Commission on Human Rights, will now deliver his opening remarks.

CHAIR GASCON:

Thank you.

The Honorable Commissioners of the Commission on Human Rights, dear friends in the business as well as the environmental community here present, other NGOs, stakeholders, our friends in media, good morning.

The Commission on Human Rights of the Philippines is an independent national human rights institution created by the 1987 Constitution, specifically Article 13, Section 18 thereof. This Commission is mandated, among others, to investigate all forms of human rights violations committed by any person on the basis of complaints received by the Commission or initiated by this office. It is also mandated to monitor compliance by the government with international treaty obligations where the Philippines is a state party, as well as customary international law. It has been a long time coming but today, in this new session hall of the Commission on Human Rights, we are pleased to open the next stage of an important undertaking with the first of a series of public hearings that form part of proceedings on a matter that, to our knowledge, is of singular character anywhere—an action brought to a national human rights institution invoking human rights standards and norms upon actions or activities that impact upon the environment.

Last weekend, we commemorated the Earth Hour by shutting lights together in a designated time. In a few weeks, we shall be celebrating Earth Day. And this highlights the fact that we can no longer ignore the impact of significant changes in global temperatures and the rising sea levels on peoples' lives. This is a matter already described by former US Vice President Al Gore as "an inconvenient truth," a truth with devastating consequences suffered by nations across the world, such as the Philippines.

As we have been witnesses ourselves in this country to a state of natural disasters and super typhoons such as *Ondoy*, *Sendong*, *Pablo*, and of course *Yolanda* with grave consequences. Some of the survivors and victims of these disasters who have directly suffered from them are here with us today.

It is no wonder, therefore, that the Philippines is at the forefront of seeking to address this issue. As the previous chair of the Climate Vulnerable Forum, our leaders had sought to forge a legally binding agreement to reduce greenhouse gas emissions and to also introduce language-referencing human rights within the framework convention on climate change, at least since the COP 21 discussions in Paris over two (2) years ago, which—I by the way want to note—two (2) of our commissioners, Commissioner Gwen and Commissioner Cadiz, had participated in.

Perhaps this is what has prompted climate change advocates and their partners, NGOs, as well as the individual victims I have referred to earlier of natural disasters in this country, to bring forward to this Commission a novel petition. And it had been originally filed on the 22nd of September 2015 but had been amended on the 21st of July 2016.

Thus, for the first time anywhere, an action casting the issue of climate change within the framework of human rights has been filed with a national human rights institution that seeks to draw attention to business practices' impact upon individual human rights. In particular by demanding the so-called "Global Carbon Majors" to answer for the negative impact of their activities, thereby drawing the interests of an international community of stakeholders. Which is why, by the way, we have monitors because, as we are conducting this first public hearing, we are being streamed across the globe and there are people from different parts of the world that are monitoring our proceedings. Also, and our Chairman will note this for you, we had, in fact, received several *amicus curiae* briefs from all over the world for this purpose.

The Petition raises jurisdictional and transboundary issues. It asks the Philippine National Human Rights Institution, the Philippine Commission on Human Rights, to consider whether companies that are not all domiciled in the Philippines could be held liable for their actions conducted elsewhere and these transboundary effects of their business operations here.

Let me clarify that, in the exercise of its powers, the Commission on Human Rights does not perform judicial functions and as such, does not impose pecuniary or other penalties. That is a power left to a competent tribunal with appropriate jurisdiction to do so. What the Commission on Human Rights can and does have the ability to do is to investigate and monitor matters concerning the civil, political, economic, social, and cultural rights of persons, with a particular focus and concern on those who often are unable to protect themselves or to assert their rights, such as those who belong to the marginalized and vulnerable sectors of our society.

That is to say we may be able, as a commission, to look into the facts and circumstances of an event or series of events and, after due consideration and deliberation, make a determination utilizing all the relevant expertise at our disposal, whether there has occurred a human rights violation and to consider who the perpetrators might be.

For this purpose and in this instance, the Commission has decided to give due course to this petition and to conduct a National Inquiry akin to other national inquiries that we have already regularly conducted with regards, for example, to indigenous peoples' rights and on the implementation of the Reproductive Health Law's impact on women's rights.

This Inquiry commenced some time back with the process of first familiarizing ourselves with the issues surrounding climate change. A series of consultations was conducted. The promulgation of rules was undertaken. The issuance of summonses was made at a global level—and we had to give time for the Global Carbons to answer. Some answered, some had ignored our summonses. All of which have led us to this point. We now hope to conduct these public hearings over a period of not more than a year and to come out with a report in due course.

The objectives of this National Inquiry are as follows: to gather basic baseline scientific data and other information surrounding the issues of climate change, to understand the business activities of so-called "Carbon Majors" in so far as their alleged impact on climate change is concerned, and to determine if states such as the Philippines are obligated to regulate the activity of state actors within their respective jurisdictions to prevent and/or mitigate the violation of human rights of members of those states.

By its nature, this National Inquiry, including the public hearings, will be conducted in a free, open, and non-adversarial manner. This National Inquiry shall be transparent, and the hearings shall, as a general rule, be open to the public.

We enjoin the participation of all stakeholders, especially those that have been impleaded in this Petition, such as the Global Carbon Majors, some of whom I hope are represented in this forum today. We hope that all of us will participate in this process, which in many sense can be viewed as a dialogue on the nexus between human rights and climate change.

The Commission has designated Commissioner Roberto Eugenio Cadiz as the focal commissioner who shall preside and direct the relevant proceedings on

this matter with the assistance, support, and guidance of the Commission *en banc*.

We have adopted appropriate rules for the same, and the parties and other interested interlocutors in these proceedings are made aware of, and shall be governed by them at all times.

We look forward to an interesting set of discussions on this matter and hope that it shall be used as a learning exercise for us—for us all, that it becomes a teaching moment for all that care for the environment and for humanity.

Good morning.

CLERK OF THE INQUIRY:

Thank you for your opening remarks, Honorable Chairman Jose Luis Martin C. Gascon.We shall now adjourn for ten (10) minutes, or until 10:02 AM.

CLERK OF THE INQUIRY:

All rise. The Commissioners of the Inquiry Panel:

1. Honorable Leah C. Tanodra-Armamento
2. Honorable Commissioner Gwendolyn Ll. Pimentel-Gana
3. Inquiry Panel Chairman of the NICC, Honorable Commissioner Roberto Eugenio T. Cadiz
4. Honorable Commissioner Karen S. Gomez-Dumpit
5. Chair of the Commission on Human Rights, Honorable Jose Luis Martin C. Gascon.

Everyone may now be seated. The Inquiry hearing is now in session.

COMMISSIONER CADIZ, CHAIR OF THE INQUIRY PANEL:

[Bangs gavel]

I would just like to clarify certain matters that will govern the proceedings. First, in accordance with Sections 1 and 2, Rule 7 of the Commission's Rules of Procedure, these public hearings shall be non-adversarial, rather dialogical. Witnesses of parties shall be treated more as resource persons of the Inquiry Panel.

We take note that counsel for Respondent CEMEX, in its Manifestation, dated 7 December 2017 and received by this Commission on even date, has withdrawn its challenge on the jurisdiction of the Commission to conduct this Inquiry and is, therefore, no longer seeking a formal resolution of its Motion to Dismiss, dated 14 September 2016.

In any case, the matters concerning the jurisdiction of the Commission to hear this Petition and the limits thereto have been addressed by this Commission during the meeting of the parties, held on 11 December 2017.

Having said all these, we continue to enjoin the Respondents to participate in this Inquiry. May we now have the appearances of counsels?

COUNSEL FOR PETITIONERS, ATTY. SORIANO:

Zelda Soriano, Your Honors.

PANEL CHAIR CADIZ:

Could you go near the microphone so that this can be recorded, Zelda? The hearing is being transcribed so please turn on the mic.

COUNSEL FOR PETITIONERS, ATTY. SORIANO:

Good morning, Your Honors. Zelda Soriano, respectfully appearing for the Petitioners.

COUNSEL FOR PETITIONERS, ATTY. MAYO-ANDA:

Good morning, Your Honors. Grizelda Mayo-Anda, respectfully appearing for the Petitioners.

COUNSEL FOR PETITIONERS, ATTY. PAUDAC:

Good morning, Your Honors. Hasminah Paudac, respectfully appearing for the Petitioners.

PANEL CHAIR CADIZ:

Are there other counsels representing other parties who wish to be recognized, even just as observers?

Seeing none, we may now proceed to the opening statement of Petitioners' counsel. Atty. Soriano? Do you prefer to…

ATTY. SORIANO:

(requests for permission to read opening remarks)

PANEL CHAIR CADIZ:

Alright, we will give you that opportunity.

ATTY. SORIANO:

Today, by significance, is like the little government warning in every cigarette pack, "Smoking kills." A little warning that makes one informed, that leads to an informed decision, that becomes a basis not only to change an individual's behavior but also a reason, for example, to tax more the cigarette companies.

And that little warning got there in that cigarette pack because, once upon a time, some groups of people sued the giant cigarette companies and the court listened to them. The court listened and rejected the excuses of companies that it should be the smokers who must be blamed. They rejected, or the court rejected- the excuses that the impacts of smoking cannot be quantified and that liability cannot be measured and assigned to many companies.

But the people who brought the tobacco cases and the court that heard the cases measured the almost unmeasurable at that time, considered the almost unthinkable at that time, made a decision and set a precedent.

Today is also like *Reyes vs. Bagatsing*, *Oposa vs. Factoran*, and *Miranda vs. Arizona*. At the core of these landmark cases were stories of everyday life and everyday concerns. And because of that everydayness, the cases of these few people resonated with all people.

Permit, is that a requisite of the freedom of expression because of *Reyes v. Bagatsing*? No one should be allowed to abuse the environment and natural resources because of *Oposa v. Factoran*. Even an accused has rights that should be respected because of *Miranda v. Arizona*. We would not exercise and enjoy our human rights in the way we exercise and enjoy them today because—and that's because some people once upon a time sued the powerful and braved odds, told their stories in court, and fought the unknown and the unchartered, and the court listened to them. The people refused to accept the powerful dominated status quo, and the court listened to them, decided and set a precedent.

The importance of the National Inquiry on Human Rights and Climate Change in the Philippines is like that tobacco cases—*Reyes vs. Bagatsing*, *Oposa vs. Factoran*, and *Miranda vs. Arizona.* And here today, the Petitioners will present their witnesses and resource persons. Petitioners' resource persons who are from the scientific, legal, and academic communities will show how and why the unearthing and extraction of coal, oil and gas release massive amounts of carbon dioxide into the earth's atmosphere that affected the nature's processes and caused anthropogenic climate change. They will explain how climate change impacted the sea level, the acidity of the oceans, and the planet's temperature. And they will answer the questions "Why do we have hotter days and nights?", "Do we have more destructive typhoons and extreme weather events in this era of climate change?," and why those who have unearthed and extracted fossil fuels and those who released massive carbon dioxide into the earth's atmosphere and who continue to do so must be held responsible for the climate change and its consequent impacts and implications on the human rights of the Filipino people. They will also tell the

Honorable Commission that it is possible to address the problem, that there are solutions and remedies, and that the choices are not limited to having fossil fuel-based energy and no energy at all because there are so many other choices, more choices for cleaner and renewable energy, for example, if only the Respondent companies choose to shift to cleaner, better, renewable energy, for example.

Petitioners' witnesses who are from the farming, fishing, and indigenous peoples' communities and from the transport sector will show how their lives were changed by climate change or rather by climate-related events that involve losing loved ones—friends, neighbors; losing family legacy, cultural tradition, the chance to education; losing an opportunity to improve one's lot; and sometimes losing pride, dream, and hope. How one injustice led to another injustice and compounded by other injustices in the setting of everyday life and concerns in this era of climate change.

Petitioners' witnesses are from the front lines of climate change impacts. They are the faces and voices of the poor majority not just in the Philippines but all over the world who bear the brunt of the problem that they did not create.

So today the Petitioners are asking the Honorable Commission, the Respondent companies who may be here or elsewhere, and the people who are here or other parts of the world watching today's unique proceeding to listen to the stories of the Petitioners and resource persons, to keep an open mind, and to see the opportunity in the difficulty and the everydayness in the novelty of this case. We are not only in the middle of the public hearings today and tomorrow or the National Inquiry, we are also in the middle or, more precisely, in the front in terms of the timing of the filing of this Petition and the launch of this National Inquiry. In the middle or in the front of a historic global movement where climate change-affected communities are standing up and demanding liability and justice against those who are responsible to the global climate crisis. At the same time, this is when the courageous, the forward-looking, and the visionaries among the members of the bunch or rather of the bench and bar are braving the uncharted territories of the law, considering the seemingly unthinkable, measuring the seemingly unmeasurable, and delivering the law and justice system to address the injustices that are unprecedented in the era of climate change.

New York, San Francisco, and seven other communities in the United States are already suing oil companies who are also respondents to this Petition. Those communities are seeking compensation for the costs of protecting their residents and economies from the devastating impacts of climate change.

A Peruvian farmer and mountain guide is asking a German court to force a coal-producing and burning utility to pay its share in the cost of protecting his hometown from a swollen glacier lake at risk of overflowing from melting ice and resulting to damage in his property. The respondent in the German case is also one of the Respondents in this Petition.

Climate change affected people have already sued their own governments for inadequate measures and actions to address the problem. This is the crux of the Urgenda case in the Netherlands, the Juliana case in the United States, the senior women in Switzerland, and many others.

The demand for climate justice is unavoidable. The movement for climate justice is unstoppable. It is up to us here today to make another tobacco case, a *Reyes vs. Bagatsing*, an *Oposa vs. Factoran*, and a *Miranda vs. Arizona*. In short, it is up to us here today to make a humble contribution to making our planet a better and safer place for us and for the generations yet unborn.

The Honorable Commissioners, good morning. The Petitioners are ready to present their witnesses and resource persons.

PANEL CHAIR CADIZ:

Thank you very much, Counsel, for your opening statement. Clerk?

CLERK OF THE INQUIRY:

Preliminarily, Your Honor, in consideration of our sign language translator and our transcriptionist, it is requested that all statements be spoken a bit more slowly and clearly.

Further, Your Honor, it is noted that, as of yesterday, 26 March 2017, consistent with their position, none of the Respondents have submitted to the Inquiry Panel a list of proposed witnesses which it may consider as resource persons. Petitioners' witnesses' statements were received through the officially designated email, nicc.chrp@gmail.com, on 19 March 2018.

PANEL CHAIR CADIZ:

We take note of all these.

Counsel for Petitioners, you may now proceed to present your first witness.

ATTY. MAYO-ANDA:

Good morning again, Your Honors. We would like to call our first witness for today or resource person in the person of Ms. Rica Diamzon Cahilig.

PANEL CHAIR CADIZ:

May we request our legal officer to swear in the witness?

CHR LEGAL OFFICER:

(Assists witness to the stand. CHR Legal Officer to give oath.)

PANEL CHAIR CADIZ:

Counsel, you may proceed.

ATTY. MAYO-ANDA:

Thank you, Your Honor. We are calling on Ms. Rica Diamzon Cahilig to share her concerns as a member of the youth and indigenous peoples' community in relation to the impacts of climate change as well as climate action. Our first resource person is a member of the *Ayta-Ambala*, a twenty (20)-year old working student.

Your Honors, may we be allowed to ask questions in the vernacular where she's comfortable with? And we further request, Your Honor, that the questions and answers be recorded verbatim in such language?

PANEL CHAIR CADIZ:

Alright, but do you have a translator who can relay to us the question and answer? If she will be testifying in the vernacular, who's going to translate for her? Can you do it?

ATTY. MAYO-ANDA:

We'll…

PANEL CHAIR CADIZ:

Excuse me, Counsel.

CHAIR GASCON:

The translations are for purposes of those who might be abroad listening or watching and if it's in the vernacular, they might turn off the streaming.

PANEL CHAIR CADIZ:

When you say "the vernacular," are you referring to Tagalog?

ATTY. MAYO-ANDA:

Yes, Tagalog.

PANEL CHAIR CADIZ:

Alright. Okay. So, I suppose we can do the translation. *Mayroong ba tayong translator?* (Do we have a translator?) Zelda, you will…Atty. Soriano?

ATTY. SORIANO:

We will help each other.

PANEL CHAIR CADIZ:

Alright. Please proceed.

ATTY. MAYO-ANDA:

Thank you, Your Honors. We have here with us, Your Honor, a five (5)-page document entitled "*Salaysay ni Bb. Rica Diamzon Cahilig*," which was executed March 13, 2018, signed by Ms. Cahilig on March 16, 2018, and received by the honorable Commission on March 20, 2018. Binibining Cahilig.

ATTY. PAUDAC:

Ms. Cahilig.

ATTY. MAYO-ANDA:

Naalala mo ba itong dokumentong ito na may limang pahina?

ATTY. PAUDAC:

Do you recall this document consisting of five (5) pages?

MS. CAHILIG:

Opo. (Yes)

ATTY. MAYO-ANDA:

Sa panglimang pahina dito.

ATTY. PAUDAC:

On the fifth page of the document.

ATTY. MAYO-ANDA:

Bawat sentence *na lang. May lagda sa taas ng pangalan na Rica Diamzon.*

ATTY. PAUDAC:

There is a signature above the name Rica Diamzon Cahilig.

ATTY. MAYO-ANDA:

Kaninong pirma ba ito?

MS. CAHILIG:

Sa akin po.

ATTY. PAUDAC:

Whose signature is this? That's mine.

ATTY. MAYO-ANDA:

Mine*, sabi nya.* Mine *daw.*

ATTY. PAUDAC:

Mine. That's mine.

ATTY. MAYO-ANDA:

Okay. We would like to have this document marked, Your Honor, as Exhibit M because we have the previous markings already.

PANEL CHAIR CADIZ:

Alright, Clerk, please mark the document as requested. Counsel, I understand that you're marking it as Exhibit M.

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Because during the pre-trial or the pre-hearing last December, you had other exhibits that have been previously marked.

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

From Exhibits A to L?

ATTY. MAYO-ANDA:

L. Exhibit L.

PANEL CHAIR CADIZ:

Okay, which you will be presenting later on.

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

But since this is your- the document that's being identified by this witness-

ATTY. MAYO-ANDA:

Is Exhibit M.

PANEL CHAIR CADIZ:

You're using Exhibit M. Can you please bring the document to the clerk so that it can be properly marked?

ATTY. MAYO-ANDA:

At this point, Your Honor, we will request now from Binibining Cahilig a brief summary of her statement.

PANEL CHAIR CADIZ:

Alright, please proceed.

MS. CAHILIG:

Magandang umaga po sa inyong lahat.

ATTY. PAUDAC:

Good morning to everyone.

MS. CAHILIG:

Ako po si Rica Cahilig, twenty (20) years old.

ATTY. PAUDAC:

I am Rica Cahilig, twenty (20) years old.

MS. CAHILIG:

Working student. *Galing po ako sa Bataan na isang Ayta-Ambala. Bali gusto ko lang po sa inyong…*

ATTY. PAUDAC:

Twenty (20) years old from *Ayta-Ambala*, from Bataan.

MS. CAHILIG:

Gusto ko lang pong ibahagi sa inyo yung kwento ko na kung pano nakakaapekto sa akin ang paiba-ibang klima.

ATTY. PAUDAC:

I just wanted to share my story on how the changes in climate change affect me.

MS. CAHILIG:

Dati, bilang isang katutubong Ayta galing sa Bataan.

ATTY. PAUDAC:

As an Ayta from Bataan.

MS. CAHILIG:

Dati kumukuha kami ng tubig sa sibul o patulo lang.

ATTY. PAUDAC:

Before, we get water from a well? Or natural spring. Sorry, Your Honors.

MS. CAHILIG:

Tapos ngayon, dahil nga po sa matinding init, natutuyo na yung tubig sa aming pinagkukuhanan.

ATTY. PAUDAC:

But because of the severe, extreme heat, the source where we get our water is now already dry.

MS. CAHILIG:

Iyong pangalawa, sa aming kabuhayan, nakakaapekto din yung paiba-ibang klima dahil ang aking ama ay isang magsasaka lamang.

ATTY. PAUDAC:

Secondly, the changes in climate affects our life because my father is a farmer.

MS. CAHILIG:

Alam naman natin, pag magsasaka, unang-unang pangangailangan natin ay ang tubig.

ATTY. PAUDAC:

And we know that a farmer needs water.

MS. CAHILIG:

Bali kung walang tubig, pano na lang..

ATTY. PAUDAC:

If there is no water…

MS. CAHILIG:

Pano na lang po yung halaman namin?

ATTY. PAUDAC:

How about the plants?

MS. CAHILIG:

So, yun, kung, nakakaapekto yung paiba-ibang klima sa aming kabuhayan dahil dati nakakaani pa kami ng masagana dahil nga yung tatay ko isang magsasaka. Dati nakakapagtrabaho pa sya ng hanggang 1 or 2 *PM. Pero dahil nga po sa tindi ng init na dinaranas ngayon, hangang* 10 or 11 AM *na lang sya nagtatrabaho.*

ATTY. PAUDAC:

Sorry. I was not able to get everything. It affects the the life my father. Before, he used to work from up to, sorry again, 1 to 2 PM, but now he's working only until 11 AM.

MS. CAHILIG:

Ah, iyon, bali naaapektuhan yung panggastos namin. Dati masagana yung ani.

ATTY. PAUDAC:

That affects our cost of living.

MS. CAHILIG:

*Yes po. Pero ngayon, dahil nga hirap nang magtrabaho si tatay ko, bali dun naaapektuhan yung pang-*budget *namin.*

ATTY. PAUDAC:

Now, because it's so hard for my father to work, now the budget of the family is affected.

MS. CAHILIG:

Yes *po. Ah, pangatlo, kagubatan.*

ATTY. PAUDAC:

Third, forest.

MS. CAHILIG:

Alam naman po natin na pag indigenous people*, yung kagubatan po kasi para yung tahanan namin.*

ATTY. MAYO-ANDA:

(For) the indigenous peoples, the forest is our home.

MS. CAHILIG:

Yes *po. Bali sa kagubatan, iyon yung nagiging* food supplier *namin. Dito namin nakikita yung botika [at] pangkain. Di ba may* herbal medicine*? Dito po namin kasi kinukuha lahat. Tapos pagkain namin. Alam naman po natin na pag sa bundok may sapa, dito kami kumukuha ng mga lamang-tubig.*

ATTY. MAYO-ANDA:

Okay. I'll just translate this. From the forest, we get our food, herbal medicine, and water. And that is our life. It's also like a pharmacy. The forest gives them oxygen and also water that support their life. Your Honor, please, may we make a manifestation, Your Honors? Would it be…

PANEL CHAIR CADIZ:

Go ahead.

ATTY. MAYO-ANDA:

So that she can present her summary uninterrupted, would it be possible that we submit the translation in English later?

PANEL CHAIR CADIZ:

Alright, to facilitate the giving of the testimony. But the people who are observing will not understand what she says, so we'll just ask them to bear with us. For purposes of facilitating the giving of the testimony, we will allow that. Alright.

ATTY. MAYO-ANDA:

Thank you very much, Your Honor.

What we can also do, Your Honors best efforts, we will jot down what she's written and translate it and then we can present it later if that's something that's acceptable.

PANEL CHAIR CADIZ:

Yes. So, please go ahead.

MS. CAHILIG:

Iyong pang-apat po, kultura. Meron po kaming tinatawag sa aming community *na pagdadanso. Dito po yung mga katutubo pong Ayta o Ayta-Ambala, napupunta po sa bundok* one (1) to two (2) weeks *po. Mag-iistay po sila, mag-iistay kami sa bundok. Magdadala lang kami ng asin at bigas po sa bundok. Iyon lang yung dadalhin namin pero mabuhuhay kami ng* one (1) to two (2) weeks *doon. Mag-iistay kami dahil nga sabi nga po namin, yung kalikasan parang iyon po yung tahanan namin, yun yung parang bahay namin, diba po?*

Ah, kahit iyon lang po yung dala namin, mabubuhay po kami dahil, at sabi ko nga po kanina, andun yung botika namin, andun yung palengke namin, andun yung hardware *namin—doon po kami kumukuha. Bali sa ilog, kukuha kami ng pang-ulam. Tapos sa bundok, doon kami kukuha ng mga halaman na pwede naming kainin.*

Sa pag-aaral ko naman po, isa akong working student. *Siguro kung hindi naapektuhan yung kabuhayan namin dahil sa pa-iba-ibang klima, siguro hindi ako nagtatrabaho ngayon para masustentuhan yung pag-aaral ko para makatulong ako sa pamilya ko. Minsan kasi, pagpapasok ako sa* school *sa umaga, sa gabi magtatrabaho ka. Tapos ang hirap lang na pag may* exam *ka, hindi ka na matutulog.*

Dapat siguro kung hindi naapektuhan yung kabuhayan namin, yung nanay ko natutustusan pa rin yung pangagailangan ko. Kasi dati, uuwi ako sa amin,

*naka-*ready *na yung pagkain. Parang andun na lahat. Pero dahil nga kailangan kong magtrabaho, kailangan kong sustentuhan yung pag-aaral ko, napipilitan akong magtrabaho na sa gabi. Pag uwi mo sa bahay, kakain ka na lang, pero ngayon, di ka na makakain nang maayos. Minsan nga* noodles *na lang kinakain ko.*

Siguro, kung okay yung klima natin, na hindi ba nga minsan pag magtatanim po kasi yung tatay ko, pag magtatanim di ba seasonal *po? Dahil nga sa paiba-iba, buong tag-araw, tag-ulan. Parang nag-iiba po kaya dun naapektuhan yung hanap-buhay namin.*

ATTY. MAYO-ANDA:

May I be allowed, Your Honor, to ask additional questions for clarification? Also in the vernacular, Your Honor.

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

We will ask my colleague to translate.

ATTY. PAUDAC:

Before, there is what we call our culture of '*pagdadanso*'. We go one (1) to two (2) weeks to the mountains. We will bring only salt and rice, but there, we will survive because nature will provide. Even that's the only thing we have. The nature is our pharmacy. Everything is there—our food, the plants that we eat.

Second, there's my schooling. It is really affected. I am a working student. Because of climate change or because of the effects of climate change, I could no longer stay home or help my family but I have to work. It's even hard because when you have an exam, I barely sleep. If my family's livelihood is

not affected, my mother or my parents can still provide. Before, when I go home, everything is there, everything is provided. There is food, there is food there. But because of these circumstances, I can even barely prepare my food. I'm working. I can barely eat. Sometimes I just eat noodles. My father cannot also do farming properly because of the changes in the climate.

That's it, Your Honors.

ENGLISH TRANSLATION (TRANSLATION SUBMITTED AFTER PUBLIC HEARING)

(The fourth is our culture. We have what we call in our Aeta community "*pagdadanso*." The native *Aeta-Ambala* goes to the mountains for one to two weeks, bringing with them salt and rice grains and we will stay there for one to two weeks and that is only what we will eat. We say that nature is our home. Even if those are the only things we bring, we can survive. And as I have said earlier, our pharmacy is there, our market is there, our hardware is there. In the river we get our viand, and then in the mountain we get plants that we can eat.

In my studies, I am a working student. Perhaps if our livelihood was not affected because of the changes in the climate, perhaps I am not currently working to support my studies and to help my family. In the morning, I go to school, in the evening I work. It is hard if I there is an exam, you can no longer sleep, that is why it is hard for me. If our livelihood was not affected, my mother could still provide for my needs. Before I go home and it is like the food is ready, everything is there but because I needed to work I needed to support my studies, sometimes when I am tired, I can no longer eat properly, I just eat noodles.

Our climate changes that is why my father's plants are affected, it is seasonal. But because rainy and sunny days are changing, our livelihood is affected.)

ATTY. MAYO-ANDA:

May I be allowed to ask additional questions?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Binibining Cahilig, sa salaysay mo, binanggit mo na ang pagdadanso ay ginagawa ng mga matatanda. Bakit mahalaga sa inyong mga kabataan na ito ay mapagpatuloy kung matatanda naman ang gumagawa nito?

ATTY. PAUDAC:

Ms. Cahilig, you mentioned in your statement the culture of *pagdadanso*, why is it important in you as a youth when you said that is being practiced by the old people?

ENGLISH TRANSLATION (TRANSLATION SUBMITTED AFTER PUBLIC HEARING)

(Ms. Cahilig, in your statement you mentioned that the culture of *pagdadanso* is being practiced by the elderly. Why is it important to the youth that it be continued if the elderly people are ones doing it?)

MS. CAHILIG:

Sobrang importante po sa amin yun kasi kung hindi po namin ipagpapatuloy yung pagdadanso, kung sa matatanda naming kung sa mga ninuno lang po, kung sila lang yung gagawa, paano naman po kung magkakaanak po kami or may iba pang mga kabataan sa amin na katutubo, paano na lang namin ipagpapatuloy kung hindi po namin gagawin? Ah, drawing na lang po ba yun? Or kwento na lang po ba? Mas maganda po kung pinagpapatuloy pa po yung pagdadanso kasi isa pong kultura yun sa aming mga katutubo yun.

ENGLISH TRANSLATION (TRANSLATION SUBMITTED AFTER PUBLIC HEARING)

(It is so important to us because if we will not continue *pagdadanso* how about if we bear children or the other indigenous youth? How are we going to continue if we are not going to do it? Will it only be a drawing or a story? It is better if we will continue *pagdadanso* because it is our culture as indigenous people.)

ATTY. PAUDAC:

It is important to us because if we don't continue *pagdadanso* who will do it? How about us? Who will continue it? Is it just a drawing?

ATTY. MAYO-ANDA:

Binibining Cahilig, meron ka pa bang gustong sabihin o ipahiwatig bukod doon sa nasabi mo na?

ATTY. PAUDAC:

Ms. Cahilig, do you have anything to say other than those you have already said?

MS. CAHILIG:

Gusto ko lang imensahe. Sa Bataan po kasi may coal plant *na ginagawa. Sana lang itigil yun or palitan ng mas magandang* environment-friendly *kasi hindi lang naman kabataan yung naapektuhan, marami ding iba pang kabataan. Pano pa yung mga isisilang pa na mga kabataan kung hindi ititigil yun?*

Sa Bataan po kasi, may tatlong coal plant na natayo dun. Dalawa sa Limay, Bataan at saka isa sa Mariveles, Bataan. Ang dami pong naapektuhan na mga tao dun—nagkakarashes, nagkakasakit sa baga. Paano na lang kung hindi po itigil yun? Sana naman palitan ng renewable energy. *Pwede naman nating*

gamitin yung solar *na kung maaari sa araw na lang tayo kumuha ng* energy. *Wag na lang sana sa mga usok na malalaki na yun sa* coal, *wag na lang sana.*

ATTY. PAUDAC:

[In] summary, I want to say that, in Bataan, there is a coal plant. I hope that they will stop that or change it into something environmental-friendly. I'm not the only one affected, other youths as well. In Bataan, there are, at least, three (3) coal power plants. We cannot…Why don't we just get our energy from the sun, from the solar and not by burning coal?

ATTY. MAYO-ANDA:

Your Honor, that will be all for Ms. Rica Cahilig, unless Your Honors have questions for her.

PANEL CHAIR CADIZ:

Thank you very much, Counsel. I understand that you still have several witnesses to be presented during the day, so the Panel has decided to reserve its right to recall this witness at a later date if we deem necessary for further questions. Thank you very much, witness. You may now go down.

ATTY. MAYO-ANDA:

Maraming salamat. (Thank you.)

PANEL CHAIR CADIZ:

Counsel, you can proceed to the presentation of your second witness.

ATTY. PAUDAC:

Thank you, Your Honors. Your Honors, may we call on our second witness, Doctor Gerry Bagtasa?

PANEL CHAIR CADIZ:

Please swear in the witness.

CHR LEGAL OFFICER:

Kindly raise your right hand. Do you swear to tell the truth and nothing but the truth in this National Inquiry under pain or penalties under the law?

DR. BAGTASA:

I do.

ATTY. PAUDAC:

Your Honors, Doctor Gerry Bagtasa is the Deputy Director for Research and Associate Professor at the University of the Philippines' Institute of Environmental Science and Meteorology, Diliman. He earned his Bachelor of Science degree in Physics with specialization in computer applications and Master's of Science in Physics from De La Salle University-Manila and also a Doctor of Philosophy in Science from Chiba University in Japan.

Doctor Gerry Bagtasa is an atmospheric scientist. He's here to explain what is climate change, its cause and effect, and the vulnerability of the Philippines to the impacts of climate change. Your Honors, we have here several documents, and may we be allowed to ask preliminary questions to the resource person regarding these documents?

PANEL CHAIR CADIZ:

Please go ahead, Counsel.

ATTY. PAUDAC:

Mr. Bagtasa-- Doctor Bagtasa, I have here three (3) documents. I am showing to you a document entitled "Profile and Statement of Gerry Bagtasa, Ph.D." consisting of two (2) pages. Do you recognize this document, Doctor Bagtasa?

DR. BAGTASA:

Yes, I do.

ATTY. PAUDAC:

On the second page of the document, there appears a signature above the name Gerry Bagtasa, Ph.D. dated 17 March 2018. Whose signature is this?

DR. BAGTASA:

That's my signature.

ATTY. PAUDAC:

Doctor Bagtasa, do you confirm and affirm the statements that you made in this document?

DR. BAGTASA:

Yes.

ATTY. PAUDAC:

Your Honor, may we request that this document "Profile and Statement of Gerry Bagtasa, Ph.D." consisting of two pages be marked as our Exhibit…N?

PANEL CHAIR CADIZ:

Counsel, please mark the exhibit. So, the first page is Exhibit N, the second page is Exhibit N-1, and, just to facilitate, the signature is Exhibit N2-A.

ATTY. PAUDAC:

Thank you, Your Honor.

PANEL CHAIR CADIZ:

By the way, we forgot to mark the other pages in the first exhibit, so just please mark them accordingly. Go ahead, Counsel.

ATTY. PAUDAC:

Doctor Bagtasa, I have here what appears to be a curriculum vitae consisting of two (2) pages. Please inspect, and do you recognize it?

DR. BAGTASA:

Yes I do.

ATTY. PAUDAC:

Whose curriculum vitae is this, Doctor Bagtasa?

DR. BAGTASA:

That's mine.

ATTY. PAUDAC:

Do you confirm and affirm the contents of this curriculum vitae?

DR. BAGTASA:

Yes.

ATTY. PAUDAC:

Your Honors, may we respectfully request that this be marked as our Exhibit M?

PANEL CHAIR CADIZ:

No, I think it's already Exhibit O?

ATTY. PAUDAC:

Sorry! O, sorry. O and O-1 for the second page.

PANEL CHAIR CADIZ:

Atty. Esguerra, please mark.

ATTY. PAUDAC:

Doctor Bagtasa, there is another document that I have here which appears to contain published papers, peer-reviewed, consisting of ten (10) pages. Can you please inspect and tell me if you do recognize that document?

DR. BAGTASA:

Yes, I do.

ATTY. PAUDAC:

Whose published papers, peer-reviewed, is this, Doctor Bagtasa?

DR. BAGTASA:

That's mine.

ATTY. PAUDAC:

Thank you. Your Honor, may we request that this document "Published Papers, Peer-Reviewed" consisting of ten (10) pages be marked as our Exhibit P series?

PANEL CHAIR CADIZ:

Atty. Esguerra, please so mark. So, the first page is Exhibit P …series up to the tenth page, which will be Exhibit P-9.

ATTY. PAUDAC:

And, finally, there is another document,"Role of Greenhouse Gasses in Warming the Environment",with the name Gerry Bagtasa, Ph.D., Institute of Environmental Science and Meteorology. Doctor Bagtasa, can you kindly inspect? Do you recognize that document?

DR. BAGTASA:

Yes, I do.

ATTY. PAUDAC:

Where do you recognize that document?

DR. BAGTASA:

This, I made this document.

ATTY. PAUDAC:

Okay. Thank you. Do you confirm and affirm the statement, the contents, of this document, Doctor Bagtasa?

DR. BAGTASA:

Yes.

ATTY. PAUDAC:

Your Honors, may we request that this document entitled "Role of Greenhouse Gasses in Warming the Environment"—it is actually a PowerPoint presentation print-out—be marked as our Exhibit Q series?

PANEL CHAIR CADIZ:

How many pages do you have in that document?

ATTY. PAUDAC:

Seventeen (17) pages, Your Honors.

PANEL CHAIR CADIZ:

So, Counsel, please mark this document, first page being Exhibit Q. How many pages again, Counsel? And the last page as Exhibit Q-16.

ATTY. PAUDAC:

Now, Your Honors, Doctor Gerry Bagtasa will present the highlights or summary of his statement, Your Honors. May he be allowed to do that through a PowerPoint presentation?

PANEL CHAIR CADIZ:

Please go ahead. Will it be shown in the screen for those who are watching this proceeding?

ATTY. PAUDAC:

I believe so, Your Honors.

PANEL CHAIR CADIZ:

There, okay. Please proceed, witness.

DR. BAGTASA:

Good morning, Commissioners. Good morning, everybody. I'm Gerry Bagtasa of the Institute of Environmental Science and Meteorology in UP Diliman. I teach meteorology and climate science in UP. So, I'll explain briefly the role of, essentially, carbon dioxide in the recent global warming that we are experiencing in the past few decades.

Next slide please. So, this is temperature data for the past one thousand (1,000) years. That's 1,000 years. So, let me walk you through this graph. The red line towards the right side of the graph, that's temperature data that has been measured with a thermometer. Now, there's a lot of weather stations all over the world measuring temperature for the past more than a hundred (100) years. But, before that, we didn't have thermometers, so what we did was there are scientists in different institutions, they reconstructed temperature data. So, by reconstruction, we mean that we get the temperature data from something else. So, these things are usually from tree rings, so there are old trees more than a thousand years old. They take a look at how these trees-- they grow, and we can get information of the past climate.

We can also get ice from from the Arctic or Greenland, in those places, year after year, the snow, they don't melt significantly so it's just layers of layers of ice throughout the the recent history of our climate. And by analyzing those layers of ice, we can actually get information about past climate. So, as you can see here, the blue line, that's reconstructed usually from, like I mentioned, ice cores, corals, or tree rings, and there has been a lot of changes in the past one (1) thousand years but you will notice here that the red line, which is the measured temperature, the change is unprecedented. It's been the fastest change in the past, as far as we know, in the past two (2) thousand years or so.

Next slide please. So, a lot of studies are pointing towards the concentration of carbon dioxide in our atmosphere. Carbon dioxide is not necessarily bad. In fact, it's essential for life to exist on earth. So, before the industrial revolution, the amount of carbon dioxide was around two hundred eighty (280) parts per million. When you say parts per million, that means there are two hundred eighty (280) molecules of carbon dioxide per one million molecules of air. So, you would think two hundred eighty (280) as opposed to one (1) million, two hundred eighty (280) is rather small but that's the effect of most of the gases in our atmosphere. Even though their concentrations are really small, their effects are rather large. So, again, by the end of the 18th Century, it's around two hundred eighty (280) parts per million, now it's around four hundred eight (408). That's from two (2) months ago—four hundred eight (408) parts per million. That's a global average for CO_2. So, it has increased by around forty percent (40%) or so.

Next slide please. Like I mentioned carbon dioxide is not actually bad; in fact, we need carbon dioxide for life to exist on earth. So, when we exhale, we are actually exhaling carbon dioxide, and that carbon dioxide comes from the sugar that we eat and the oxygen that we breathe—it metabolizes inside our bodies and then the by-product is carbon dioxide. On the other hand, for plants, they make use of carbon dioxide to essentially produce oxygen and carbohydrates. The point is carbon dioxide or carbon in general is being recycled in and out of our environment. So, when we emit carbon dioxide, it goes into the atmosphere, it goes to the ocean, it goes to the plants, and the plants will undergo the process of photosynthesis and create food and things like that. The point is, it's really important and the problem that we're having right now is not carbon dioxide per se but, rather, it's the excess carbon dioxide that has been emitted in the past two hundred (200) years or so.

Next slide please. So how does carbon dioxide warm the atmosphere? Let me just explain to you briefly what we call the earth's energy budget. So, the earth's energy budget shows us, essentially, what we get, the energy from the sun and how it distributes itself once it interacts with earth. So, initially, sun's energy will come in and essentially power everything. The reason why there's life on earth, why there's wind, why there's rain, why there are clouds, it's because of the energy we get from the sun. During daytime, when the earth is exposed to sunlight, everything warms up. If you go outside, touch the ground, I'm sure you'll feel that it will be very hot. But later on, after sunset, everything will cool down. The reason for that is because, once a thing heats up, it will try to get rid of its excess energy. So, it's the same thing with earth. During daytime, it gets a lot of energy from the sun, everything heats up. And then at night time, it tries to get rid of that excess energy energy in the form of infrared radiation. The red arrow towards the right side of the graph, that means that once the yellow energy from the sun comes in, eventually, it will

be emitted back to the outer space as illustrated by the red arrows. Now, the problem is—not really a problem, but the thing is, carbon dioxide is very efficient in absorbing infrared. Instead of the infrared, the heat that the earth is trying to get rid of, instead of going straight to outer space, it gets stuck and lingers longer because of the carbon dioxide. And, again, I always mention this, carbon dioxide per se is not bad since if we were to remove all the carbon dioxide, earth will be just a snowball or very large snowball. But because of carbon dioxide, our climate is modulated. So, temperature is at this number—like, on average, around fifteen degrees Celsius (15 ºC)—mainly because of carbon dioxide. The thing is, we are putting in more carbon dioxide than what was previously there and because of this, there is more heat being trapped in our atmosphere, leading to more warming.

Next slide please. So there are several explanations or several hypotheses in trying to explain why there's a rapid increase in temperature in the past hundred years or so. And for now, in the state of science that we have, the most plausible reason that is there to explain rapid increase is the rapid increase of carbon dioxide. So, they are very well correlated as shown in this graph and aside from being very well correlated, we actually know the mechanism in which carbon dioxide can, in fact, warm our atmosphere.

Next slide please. This is another measurement from the Japan Meteorological Agency of Global Temperatures from 1890 up to recently, and we can see that there's a significant increase. When we say 'significant,' that means it's not in terms of layman interpretation. When we say significant, it's huge, but in this case, when I say significant, it's statistically significant, meaning we can actually separate the variability with the long-term change, which I will explain later on.

Next slide please. So, we know that temperature is increasing but it does not increase uniformly all throughout the world. In fact, temperature increases faster in the Northern Hemisphere—the North Pole and the South Pole—compared to the tropics. And there's a lot of explanation for this but briefly, the main explanation is because of the ice that is being melted in the, in the North Pole due to the warming itself speeds up the warming; hence, we see larger warming in the polar regions compared to the tropics.

Next slide please. The red line is a temperature data. The blue line is a CO_2 data. They are very well correlated. Some possible explanation in the recent warming that we get on earth is due to the intensity of the sun. The sun is not constant; sometimes, the sun is in fact, hotter; sometimes, the sun is cooler. So, it really has a cycle. And what you call solar activity is delineated by the yellow line and in the sixties, actually scientists thought that it may be that the

activity of the sun is affecting our temperature, our climate. So, if you compare from around 1960s to around 1990, the solar activity is increasing, at the same time temperature on Earth was also increasing. But after the nineties, we're actually entering minimal solar radiation which is expected to last until around 2030. But even though the solar radiation, solar activity rather, is going down, we are still seeing unprecedented increases in temperature. So that means that it's not likely that the solar radiation can explain the warming environment; it's very likely from statistics and from physics that we know about the atmosphere that [it's] the amount of carbon dioxide.

Next slide please. This is the same graph so I'll just skip this. Next slide please. Ah, so here *kasi*, when we look at the temperature, there's a lot of changes. So, those changes are mostly natural and we call that variability, the technical term is variability. So, this year it may be hot, next year it may be hotter, then the following year may be cooler, and that's actually natural because of the chaotic nature of our atmosphere. So, again, that's variability. But on top of the variability, we see what we call *yung* [the] long-term change. So sometimes it's difficult to separate these two, to separate the variability from the change. Sometimes the variability is so large that you cannot actually see the change. But in the recent few decades, we are actually seeing a significant change in terms of the temperature, not only the variability but we are actually seeing that the temperature overall is increasing.

Next slide please. This is on global rainfall distribution, which I think Ma'am Rosa of PAG-ASA will be explaining more later. With the changes on temperature in the present calculation is that when there's a one degree (1°) increase in temperature, the atmosphere can hold seven percent (7%) more water. So as the atmosphere warms up, it has the ability to hold more water and that will translate to rainfall. It's either more rain in certain places and less rain in other places, so it's not uniformly distributed. That's the other thing. And the problem with this is when you are used to, say, a certain amount of rain and then there's more rain, that's a problem with flooding and certain hazards. On the other hand, if there's less rain, then that's also a problem—drought in terms of agriculture, food security. So, there: whether it's more or less, there's a problem with that.

Next slide please. I'll skip this one. Next slide please. So the sea level is also a very big problem in terms of climate change. Because of the warming environment, ice is melting in Greenland and in the Arctic. So, aside from the melting of the ice, which is not much of a problem since if you have, say for example, ice water, if you melt the ice, the water doesn't go up very much; however, the problem is ice on land that's melting. It's like you have a glass of water and you put ice, so there's a significant increase in the amount of the level of water. So, Greenland, for example, is a vast amount of land with ice

as tall as around three (3) to four (4) kilometers. If all of Greenland were to melt, there will be a significant increase in the sea level on Earth. So that would be around six meters, which is around (as high as) a two-story building.

On the other hand, if the Antarctic were to melt, we will be seeing an increase in sea level of around sixty (60) meters. So, essentially, if we were to melt all the ice on Earth, [that's] around seventy (70) meters increase in sea level. So, in that kind of sea level increase, we will see Manila Bay and Lingayen Gulf will be connected. That will radically change the geography of the Philippines. But we're not seeing this in the near future. — [because] it's more difficult to heat water compared to air. So, even though we are seeing increases in the temperature of air already we are still not seeing a significant increase in the temperature of water since it's very difficult to heat up. It's expected that there's a few more decades—like a century, even—before we can see certain increases in the temperature of global oceans.

Next slide please.This is the distribution of global [sea level] rise. So instead of, aside from just warming and the water rises, wind also has something to do with the rising water and, as you can see here, the red line, or, sorry, the red color indicates the highest increases in the global sea level rise in the past thirty (30) years or so—let me check—in the past thirty (30) years from 1992 to 2012. And the red part is around ten (10) millimeters a year. Ten (10) millimeters is around *ilan ba* (how long)? Four (4) inches, *tama ba* (is this correct)? Yeah, and it's been happening for the past thirty (30) years. Just try to imagine this amount of rise towards the eastern side of the Philippines in the past thirty (30) years, so it's adding up. And the eastern side of the Philippines has the highest, more or less, recorded sea level rise in the world. Next slide please. Okay, so that is the end of my presentation.

CHAIR GASCON:

Doctor Bagtasa, before you proceed, I just want to find out, can you go back to that slide? That slide, the last slide. Not that one, the one before it. So, you are showing with this slide that there is a trend of global sea rise but, in particular, in the eastern sea board of the Philippines?

DR. BAGTASA:

Yes, Sir.

CHAIR GASCON:

So, the water around or to the east of the Philippines has significant sea level rise compared to many other parts of the world. Has there been studies measuring the impact of the rise of the sea on our coast on the eastern side of the Philippines? Like, have we lost land area as a result? Is there any information about that?

DR. BAGTASA:

I'm not familiar with any study.

CHAIR GASCON:

But, well, of course we can, as you showed in your previous slide, if the whole Antarctic were to melt, there will be a sixty (60)-meter rise and then, therefore, many islands will be under water.

DR. BAGTASA:

Yes, Sir.

CHAIR GASCON:

This one, maybe it's not yet 60 meters, but what we're saying is that the east of the Philippine islands has marked the largest increase in sea levels? So, we can logically presume that, over time, the islands, at least, to the east of the Philippines might be impacted, aside from, of course, the islands in the Pacific.

DR. BAGTASA:

Yes, Your Honor.

CHAIR GASCON:

There are many, you know, like Guam.

DR. BAGTASA:

Yes, exactly.

CHAIR GASCON:

Marianas, et cetera. They, too, will be affected. But can we presume that the Philippine Islands as well will be impacted?

DR. BAGTASA:

Definitely, Sir.

CHAIR GASCON:

Okay. Thank you. And is this rise in sea levels directly connected to what you mentioned earlier, the increase in carbon dioxide in the atmosphere?

DR. BAGTASA:

In terms of distribution, the reason why it's towards the western part of the Pacific, it's mainly two things: The melting of the ice, which is significant. In the recent five (5) years, for example, the ice extent in the Arctic, in the North Pole is minimal. So that means during summertime, *konting-konti na lang yung* (there is very little) ice, so a lot has been melting year after year. So that's one thing. Another is the warming of seawater. So, when water warms, it actually increases in size, so it expands. Because of that expansion, it will take up more space, it will rise. And the third is the wind. So, there's an easterly wind that (which) prevails over the Western Pacific and just like blowing through a cup of coffee, when you blow something the height at the

other end of the cup will go up and then go down here. So, it's the same thing because of the easterly wind, it tries to raise the water towards the eastern side of the Philippines.

PANEL CHAIR CADIZ:

You have more questions? Counsel, do you have more questions for your witness?

ATTY. PAUDAC:

Yes, Your Honors. May we be allowed to ask some?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

Doctor Bagtasa, thank you for your presentation. In your statement you said earlier that there's no problem really about carbon dioxide per se, it is just the excess carbon dioxide, right?

DR. BAGTASA:

Yeah. (Dr. Bagtasa nods his head)

ATTY. PAUDAC:

In your statement, you mentioned that most man made emissions of carbon dioxide are through the burning of fossil fuels. Can you please elaborate on that?

DR. BAGTASA:

Yes. We go back several hundred million years. Around four hundred (400), three hundred (300), million years ago wood started existing. So, wood-- *punong-kahoy*. And wood started existing already but there's no decomposers for wood. *Ngayon* (Now), if a tree dies, there are termites, for example, that will eat up the tree. But before there were none, no decomposers. So, what happened was there's a lot of them, they're very sturdy, as we know, and then after some time, the trees died, and then they got buried. So, let me go back further. When we plant trees, (we) start with a small plant and it's light. Then, you plant the plant. After several years, say ten (10) years, then it goes tall, becomes a tree, very heavy. And the reason why it's heavy is because it took up the carbon dioxide from the atmosphere and put it into their cells. Nature buried a lot of carbon dioxide. So that means it can capture the carbon dioxide in the atmosphere. So, let us go back to the trees from three hundred (300) million years ago. So, these trees are very sturdy, nothing decomposed them, and then they got buried so, essentially, we buried or nature buried a lot of carbon dioxide which if we did not take them, then they will perhaps stay there forever. But the thing now is we use this as fuel, the trees from three hundred (300) million years ago, they are now what we call coal. On the other hand, the animals that lived around fifty (50) million years ago, they were buried in the same, similar process, because of the pressure and heat, turned them into crude oil. So, they're buried already. These are vast amounts of carbon and then we dig them up, burn them, and then release them back into the atmosphere. So, instead of just being buried down underground, *linalabas natin sila* (we have taken them out). And this is where the excess carbon dioxide comes from.

ATTY. PAUDAC:

Thank you, Doctor Bagtasa. Earlier, you also mentioned a very likely scenario. Can you explain that as defined in the Intergovernmental Panel on Climate Change, the IPCC, that very likely scenario that you mentioned earlier?

DR. BAGTASA:

What we want of course is to try to mitigate all emissions, if possible. But because of a lot of factors like the economy and such, that's very unlikely. It's also, in a way, unlikely that we will continue to do what we're doing right

now because if we were to do that, there are laws or policies that are being put in place to try to minimize the emissions. So, there's somewhere in between the zero emission and what we're doing right now, the business as usual emission. In the middle of that is the term 'very likely': that we try to minimize but not minimize to the point of zero but less than what we're emitting right now.

ATTY. PAUDAC:

Your Honors, my colleague Zelda would like to ask follow-up questions to that.

PANEL CHAIR CADIZ:

Please, go ahead.

ATTY. SORIANO:

Doctor Gerry Bagtasa, good morning. In terms of impacts we also hear like probability that scenario A, B, or C are going to happen. So, if you will apply the words that you used 'very likely' to impacts, scenario of impacts, for example, what do you mean by 'very likely'? Does IPCC define 'very likely'? What is it?

PANEL CHAIR CADIZ:

Before you answer, what does IPCC stand for?

ATTY. SORIANO:

Intergovernmental Panel on Climate Change, Your Honors.

PANEL CHAIR CADIZ:

Alright.

ATTY. SORIANO:

Maybe you can also explain a bit about IPCC.

DR. BAGTASA:

I guess science in general, although we get results, there's actually a very important part of the result is the uncertainty. So, in the uncertainty, you try to estimate how much error. If you measure anything, the error is inherent; so even if you have a ruler, you measure the length of this paper, there would be an error. It's inherent in all measurements. And so that's why you see, it's important also to determine the error to know the accuracy of our measurement.

In terms of climate science, as far as we know, the temperature will further increase and things like that because of the use of models. So, these are mathematical models trying to simulate our atmosphere and then eventually we know that what will happen in the next fifty (50) years or a hundred years will be this and that. The thing with the climate science, the uncertainty is rather large. Like for example, if we double the concentration of carbon dioxide. Thirty (30) years ago, there are studies showing that there will be a six degree (6°) increase in global temperature. But more recent studies using more sophisticated computers, more sophisticated models, they're estimating around one-degree (1°) change. So, meaning there's a lot of discrepancy. Well, not really discrepancy but in science, we call it uncertainty. And that's really part of science but that doesn't mean that it's wrong. If we look at different models from different institutions all over the world, even though their results vary, there's a general trend wherein if we increase carbon dioxide, there will be an increase in temperature. So, when we say 'very likely,' we're referring to the current models in which they project what will happen in the next fifty (50) to one hundred (100) years.

ATTY. SORIANO:

And the IPCC, Doctor Bagtasa, very briefly, please. What is it and what does it do?

DR. BAGTASA:

So, the IPCC is under the United Nations. Essentially, there's a group of scientists and what they do is they summarize the studies all over the world regarding climate change. That's in a nutshell what IPCC is.

ATTY. PAUDAC:

Just a follow-up on your statement. You mentioned that despite the universal consensus on the climate crisis, some are skeptical, claiming that there had been no significant global warming despite ever-increasing amounts of carbon dioxide being emitted, attributing the cause in warming to natural variations in the sun's energy output, decline in atmospheric water vapor, and greater storage of heat by the oceans. But you said, however, there is no compelling evidence to support such skepticism. Can you please elaborate on that?

DR. BAGTASA:

Yeah so the reason why we have ice ages in the past or in more recently, the 17th century, there were years in Europe wherein there was no summer essentially and there's a lot of famine. And so, the reason why there are changes in the past, and this is well-known because of the interaction between the sun and Earth. So, Earth revolves around the sun. Sometimes it's far away from the sun, sometimes it's closer to the sun, sometimes the sun is more active, sometimes the sun is less active. And there are a lot of factors that, in fact, determine climate changes in the past.

But this climate change that we're looking at right now, it's very rapid and does not go with what we know about these astronomical factors. These astronomical factors, they change in the order of tens of thousands of years. So, if if there's change in temperature say, for example, in the 17th century, wherein the change was a few hundred years, it changed and then a few hundred years, changed back, then we can actually look at the astronomical

factors. But right now, just fifty (50) years and there's a very unprecedented dramatic change, it's very unlikely that it's astronomical factors that's causing the change.

ATTY. PAUDAC:

Thank you, Doctor Bagtasa. Your Honors, that will all for the witness, unless you do have further questions.

PANEL CHAIR CADIZ:

Thank you very much, Doctor Bagtasa. Thank you very much, counsels. These are obviously very technical presentations. The panel might need more time to review and study, and so, will you be available to be recalled by this panel?

DR. BAGTASA:

Yes, Sir.

PANEL CHAIR CADIZ:

Alright. Our next witness is an expert witness who will be testifying via Skype from New York. I understand that it's close to midnight already in New York and he's been on standby for some time already. So, may we now, Counsel, request that we proceed to this next witness?

ATTY. SORIANO:

Thank you, Your Honors. Our third witness, Your Honors, is Doctor Peter Frumhoff. He is the Director of Science and Policy and Chief Climate Scientist at the Union of Concerned Scientists based in the United States. He has served also on the board of Atmospheric Sciences and Climate of the US National Academy of Sciences, the board of directors of the American Wind

Wildlife Institute, the steering committee for the Center for Science and Democracy at the Union of Concerned Scientists, and the board of editors of *Elemanta: Science of the Anthropocene*. He is also a lead author of the fourth assessment report of the Intergovernmental Panel on Climate Change, which was awarded the Nobel Peace Prize in 2007.

He is being presented today to present the findings of a recent study that he co-authored. The study found emissions traced to the ninety (90) largest carbon producers that contributed approximately fifty seven percent (57%) of the observed rise in atmospheric carbon dioxide, nearly fifty percent (50%) of the rise in global average temperature, and around thirty percent (30%) of global sea level rise since 1880. That's the study that he co-authored. May we now turn to the resource person, Your Honors, for some preliminary questions?

PANEL CHAIR CADIZ:

May we request our legal staff to swear in Doctor Frumhoff, even as you (Dr. Frumhoff) are there and we are here in Manila.

CHR LEGAL OFFICER:

Mr. Witness, please raise your right hand. Do you solemnly swear to tell the truth, the whole truth, and nothing but the truth in this hearing?

DR. FRUMHOFF:

Yes, I do.

PANEL CHAIR CADIZ:

Thank you very much, Mr. Frumhoff. Are we coming across clearly to your side of the world?

DR. FRUMHOFF:

Yes, I can hear you very clearly. I hope you can hear me as well.

PANEL CHAIR CADIZ:

Yes, we can get you very clearly. So we now turn you over to your counsels. Atty. Zelda, please proceed.

DR. FRUMHOFF:

Excellent.

ATTY. SORIANO:

Thank you, Your Honors. Good evening to you there, Doctor Frumhoff.

DR. FRUMHOFF:

Yes, hello.

ATTY. SORIANO:

This is going to be a modified confirmation and affirmation because you are there and we are here. So, Your Honors and Doctor Frumhoff, we have here three (3) documents that we received from Doctor Frumhoff via email. The three (3) documents are entitled, the first one "Profile and Statement of Peter C. Frumhoff, Ph.D." consisting of nine (9) pages and, on the ninth (9^{th}) page, there is a name "Peter C. Frumhoff" with a signature above it or left side above it. The second document is entitled "Peter C. Frumhoff Curriculum Vitae" and it consists of nine (9) pages. So, what you heard earlier was a very short excerpt of his very long profile. The third document is entitled "Climate Change from Emissions Traced to Major Carbon Producers" and under that his name Peter C. Frumhoff, Ph.D. Union of Concerned Scientists. As I cannot

properly show the documents to Doctor Frumhoff, may I just read a portion in his statement stating that…

PANEL CHAIR CADIZ:

Before you proceed, Counsel, I would just like to ask the resource person… Doctor Frumhoff, do you confirm that you sent, by email, these three (3) documents that were earlier identified by Atty. Zelda Soriano?

DR. FRUMHOFF:

Yes, I do confirm that. Thank you.

PANEL CHAIR CADIZ:

Alright, please proceed.

ATTY. SORIANO:

And okay, sorry. With that, Your Honors, may we present the three (3) documents for marking as Exhibit R, R-1, and R-2? Or R series, Your Honors.

PANEL CHAIR CADIZ:

So, the profile and statement will be Exhibit R?

ATTY. SORIANO:

R for the statement.

PANEL CHAIR CADIZ:

How many pages?

ATTY. SORIANO:

Nine (9) pages, Your Honor.

PANEL CHAIR CADIZ:

Okay, so Exhibit R to R-8. Atty. Esguerra, can you please mark the document?

And, Atty. Zelda, the second document is the curriculum vitae consisting of how many pages? Nine (9) pages, so that would be Exhibit S to S-8.

And the third document is "Climate Change from Emissions Traced to Major Carbon Producers," which would be Exhibit T. How many pages is that, Atty. Zelda? The PowerPoint presentation is T. R, S, T. Okay, Exhibit T to T-20.

Alright, the exhibits have been marked? Atty. Zelda, can you proceed to examining your witness?

ATTY. SORIANO:

Thank you, Your Honors. And good evening again to you, Doctor Frumhoff. Your Honors, Doctor Frumhoff will now give us a short presentation based on the statement and the other documents that he submitted.

PANEL CHAIR CADIZ:

Doctor Frumhoff, please proceed.

DR. FRUMHOFF:

Thank you very much. It's really an honor to join you for this hearing today and I'm very pleased to be able to make a presentation on climate change from emissions traced to major carbon producers. I'm gonna ask someone else to forward the slides, so if I can have the next slide please.

So, the previous presentation highlighted the changes in climate that we're now experiencing as a consequence of the rise in greenhouse gases in the atmosphere. What people experience of course are not global averages; they experience changes in weather and, most importantly, in extreme weather which is where the harshest impacts of the climate change we're now seeing get manifested. You all in the Philippines have had far more than your share of extreme events in recent years, particularly super typhoons. I don't need to tell you what that's like in your experience.

But I wanted to share with you that extremes are happening around the world, climate extremes. The picture in front of you is from the impacts of a tropical cyclone which we call a hurricane from last fall, affecting the city of Houston and the state of Texas impacting, here as well as in other parts of the world, most severely the poor, the disenfranchised, those least able to cope with devastating impacts, including of this tropical cyclone and its impacts.

What I wanted to say is that, of course, extreme events happen. They've happened over the course of Earth history, of human history. What's different now is the extent and severity of those impacts and a whole body of science, climate attribution science, is beginning to allow us to characterize quite robustly just how much the change that we're seeing is being driven by human emissions. So, for example, in this event, Hurricane Harvey, several studies came out shortly after the hurricane had its impacts just in December of this past year, characterizing, for example, that the extreme flooding that took place in the City of Houston from this hurricane storm centering over that portion of the United States was about, at least, three times worse, three times more likely to occur at that level of severity because of climate change. So we're able to characterize just how much climate change or emissions are worsening the impacts of extreme events on disenfranchised communities in various parts of the world.

Next slide please. The question in front of you is a question about responsibility. And, of course, science can't determine responsibility but it can inform it. And there are different ways of thinking about responsibility. In the UN framework Convention on Climate Change from 1992, the basis for international discussions and policies around climate, the core framework is

about the common but differentiated responsibilities among nations. And a very distinctively ambiguous phrase, one that highlights that all nations have responsibilities as a consequence of emissions. But some, particularly those who have had outsized contributions to the problem, have greater responsibilities than others. And science has been used to inform policy discussions about responsibilities among nations.

Next slide please. Thank you. So that, for example, a study produced four (4) years ago looked at emissions—and of course we can characterize emissions in different ways—colleagues looked at emissions from nations, emissions resulting from fossil fuel burning, from land use change, particularly deforestation and other sources, emissions that are causing warming, and asked the question, using a climate model, "How much of the roughly one degree Celsius (1°C) increase in global average temperature results from emissions from different nations?" And so, this chart just graphically shows you the disproportionate contribution to the observed temperature from some nations versus others. And that's one way in which science can inform the question of national responsibility.

But, of course, nations aren't necessarily responsible alone. The question in front of you, next slide please, is about the potential distinctive responsibilities of major carbon producers, of the companies that have extracted coal, oil and natural gas from the ground and put them into commerce and into markets. And my first entry into this question of responsibility of major carbon producers came through science. A colleague, Richard Heede, did a very detailed, painstaking study published in 2014 in which he quantified how much coal-oil-natural gas was extracted from the ground every year by individual fossil energy companies dating back to the dawn of the Industrial Revolution. A very careful body of work, published in a peer-reviewed journal, translated the coal-oil- natural gas that they extracted into how much carbon dioxide and methane, two primary heat-trapping gases, were released when their products were combusted, when they were burned, when they were used.

And what he found—next slide—is really quite striking which is, if you look at the blue line—so the blue line dating back to about 1850 is the total amount of carbon dioxide and methane released globally from all industrial sources up from 1850 to until 2010, that was the end of his study. The red line is the total amount of carbon dioxide and methane released just from ninety (90) largest carbon producers, the ninety (90) largest sources of coal oil natural gas. And what he found in summary is about two-thirds (2/3) of all of the industrial-sourced emissions of carbon dioxide and methane can be traced back to just these ninety (90) companies. A very small number of entities had a very outsized contribution to the problem, and much of that contribution, as

you can see, is quite recent. About more than sixty percent (60%) of all industrial carbon dioxide and methane emissions had been released just since 1980. We've had such an increase in our fossil fuel use that most of the emissions are quite recent. And 1980 is a date I'm gonna come back to during the course of my presentation.

If I can have the next slide. So, emissions are important; they're one (1) metric. But, of course, if we're looking at changes in climate and the damages or the impact of those changes in climate, emissions alone only get you partway there. So this, the gray at the top of this slide is essentially the carbon emissions that I was showing you in the previous slide. But emissions come from other sources, the area below that, is emissions from land use change and to understand how those emissions translate into changes in climate, one has to look at them in the context of what's called the global carbon cycle. Some of those emissions go into the oceans and stay in the oceans. Some of them go into land or into biomass, into trees, for example, and other plant products and some become increases in the atmospheric concentrations of these gases in, you know, in the atmosphere, both carbon dioxide and methane. In order to understand how climate has changed as a result of the emissions from these companies, one has to use standard well established climate models and what I want to share with you is the top line results of the work that we did to understand just what the climate impacts are from the emissions from the products of these companies.

So next slide. What I'm going to describe to you is the results of a paper that was published in the scientific journal *Climatic Change* last September titled "The Rise in Global Atmospheric Carbon Dioxide, Surface Temperature and Sea Level from Emissions Traced to Major Carbon Producers" with several authors from both academic institutions and my own institution, the Union of Concerned Scientists, a science-based nonprofit.

And, next slide. So, what did we do? We incorporated the data set from Richard Heede and his scientific publication on annual emissions into a very well established climate model that takes account of how emissions cycle through the carbon cycle. We quantified the differences in concentrations of atmospheric carbon dioxide and global surface temperature and sea level by running the model with and without emissions from each of the major carbon producers. I'll show you the top line results in a minute. And we compared the results for emissions roughly over the entire historic periods since 1880 but also since 1980 to 2010, to look at simply more recent emissions, and I'll explain why that's so [important] in a moment. We want to look illustratively at two different time periods.

Next slide. I'm going to just walk you through the results over the total historic period. So looking at global temperature increase the red area is the proportion of the rise in global temperature—it's been about one degree Celsius (1°C)—that can be attributed to the emissions from these ninety (90) major carbon producers. If we look at the fifty (50) investor-owned companies, which are a subset of these ninety (90) producers (which are the focus of your Inquiry) the number would be a little bit smaller and we can certainly provide you those data if you are interested in those specific numbers.

Next slide. And here… this is looking at just since 1980. So, the ninety (90) carbon producers, the emissions that are traced to their products, have contributed just since 1980 about a third, thirty two percent (32%), of the rise in global temperature across the surface of the earth. And what's important is that we can look at these numbers in a variety of ways: we can look at the total, we can look at the 50 investor-owned companies and we can also look at individual companies and their contributions to the emissions, the contributions of their products to changes in climate.

So, next slide please. So, these are the twenty (20) largest contributors by individual company to the historic rise in global mean surface temperature—the global temperature rise across the earth. These are percentages. And so you can see, for example, that the largest source of the rise in global temperature traced to individual companies comes from Chevron. Just about two and a half percent (2.5%) of the rise in global surface temperature can be traced to the emissions from their products and, as you walk down this slide, you can see many other companies—both investor-owned companies and some state-owned companies—and the contribution of their emissions over the total historic period to the rise in global surface temperature. The paper I'm describing is the first paper to quantify this.

The next slide is now showing you the results for global sea level. So again you can look at the three (3) , you know, the largest contributors roughly about two and a half (2.5) to two (2) percent of the rise in global sea level that we've seen so far—the twenty centimeters (20 cm) of rise in global sea level that we could have seen so far, can be traced to the products of Chevron, Exxon Mobil, BP, Royal Dutch Shell. Just those four (4) companies alone, their products have contributed about eight percent (8%) of the rise in global sea level. And one can again look at any number of companies and cut and slice this in different ways. This is just to illustrate that we can quantify the particular contribution of the products of individual companies just as we could look at this through the lens of individual nations. This is simply a different way of looking at the same global emissions.

So I want to turn back from the scientific work that I've just shown you to turn to the question of why did we look at 1980 as an illustrative date. And I want to preface my remarks on this by saying that, as I mentioned earlier, science can inform the question of responsibility but science alone can't determine it—that's for people in political leadership, in legal leadership in society to make that judgement. And, of course, for stakeholders as well. But I think there are other lines of evidence that are interesting to contemplate; it's not just what companies produced but—as with the tobacco companies that we highlighted earlier—it's what they did in light of the evidence of the risks of their products.

So next slide please. The reason why we illustratively highlighted 1980 as a point of departure for thinking about this, is because by about 1980 certainly the oil industry knew well about the risks of their products. There are a number of publications, I'm just going to cite one here. There's much other documentation in my submitted statement that, for example, a large trade association, the American Petroleum Institute, together with the nation's, in the United States, largest oil companies ran a major task force to monitor and share climate research around 1980. And there are a number of company documents that have been published highlighting their understanding of the serious climate risks of emissions from the burning of fossil fuels. Understanding is one dimension.

Next slide please. There's also a large body of evidence including work such as this report that the Union of Concerned Scientists, the organization of which I work, has produced. There are many other resources that also look at what companies did in light of the evidence of their products. I won't go through a detailed presentation now in the interest of time but again, [as] with the tobacco industry, it was evidence of what companies did to sow doubt about their products that led to an understanding of their ethical and societal responsibilities for the harms those products cause. And there's plenty of evidence that many in the fossil fuel industry acted in similar ways. Certainly not all but certainly many.

For example, next slide please. In the report I just highlighted there are many documents that are produced that are shared. This is an internal communications memo from the American Petroleum Institute, the major trade association for fossil fuel companies in the United States, from 1998. This was around the time that the Kyoto Protocol was being debated in the United States. The first major international effort to limit emissions and, therefore, the harms from the burning of fossil fuels, and this internal communications memo, as you can see, which was then later found and made public is about a strategy that was designed and then implemented with millions of dollars of funding to sow doubt about the risks of burning of fossil

fuels to misrepresent their legitimate uncertainties as the previous speaker highlighted and those certain uncertainties are part and parcel to science. But there was a significant campaign that was undertaken to misrepresent or to overstate the uncertainties in climate science in order, as the bottom bullet in this slide shows, that those who are seeking to support the Kyoto Treaty on the basis of extant science appear to be out of touch with the reality. It was an effort to misrepresent climate science, that was frankly, in the United States, quite unfortunately successful.

And now I'm speaking as an individual, as a citizen as well as a scientist. Again, my science and the science of others can highlight the quantitative contributions of emissions from companies to changes in climate and to the harms and damages that we're now seeing in the Philippines and elsewhere around the world. But if one wants to think about responsibility for climate change and to ask the question what might we expect or what should society expect responsible fossil fuel companies to do, I wanted to submit for your consideration.

Next slide please. Again, this is not fact; this is opinion. I wanted to make sure that that's clear. But it's a body of thought through work that is based on peer-reviewed publications that are again cited in the statement and I want to put forward for your consideration that one should expect, society should expect, responsible companies to renounce disinformation, to not take actions in support of misrepresenting climate science. That companies recognizing the serious risks of further combusting of fossil fuels should plan for a world in which we are no longer polluting by the burning of fossil fuels. That we need to bring emissions globally to zero to be consistent with the temperature goals, for example, of the Paris Climate Agreement, to support fair and effective and sensible climate policies that are consistent with the goals of the Paris Agreement, to disclose to shareholders and to the public, the climate risks to their businesses, including the risks of sea level rise, for example, on their infrastructure and the risks of restricting carbon emissions on their business model as it currently exists.

And then finally—next slide, if I may—to highlight this for the purposes of this conversation, I would offer for your consideration that it's reasonable for society to expect companies who've contributed so mightily to the problem — in many cases seeking like tobacco companies to misrepresent those risks, to pay a fair share of the costs of the damages that we're now experiencing and the costs of adapting to the changes that are now locked in for several decades, that that's a reasonable thing for society, certainly the United States, and, for your consideration, in the Philippines, just to expect companies to contribute, and that the burden of paying for the loss and damage that we're

now experiencing should not fall only on the poorest communities who are experiencing it today and will continue to.

Next slide. I just wanted to share with you that the question of fossil fuel companies and their responsibilities, informed by science and informed by public discussions such as you are having here today, is taking place in other parts of the world. This is a billboard in Houston, Texas shortly after the hurricane, the tropical cyclone Harvey came through, which simply asked the question "When will climate polluters, when will the fossil fuel companies pay their fair share?" This is a question that's being asked in a variety of jurisdictions.

Next slide. As Counselor Soriano highlighted in her opening remarks, this question is now being taken up in a variety of domains in California, the state of California, my home state, and several cities and counties in New York City, in Peru by a Peruvian farmer in a German court. And, I think, very importantly in front of you as commissioners for the Philippines' Commission on Human Rights, in a way that I think is part of a larger conversation that is just beginning to be held about responsibility for climate change, that is, stepping back from the notion that only nations are responsible to ask the question informed by—but not determined by—science about the responsibilities of fossil fuel companies. And so, you know, the eyes of the world are watching this conversation. I'm very pleased to contribute to it and I'd be very happy over the course of time to provide more detailed information on both the science and if you will, the ethics of the questions in front of us. So, thank you very much.

PANEL CHAIR CADIZ:

Thank you very much, Doctor Frumhoff. Atty. Zelda, any questions?

ATTY. SORIANO:

Thank you, Your Honors, and thank you very much, Doctor Frumhoff. It's now midnight there. I have just one question and may I just manifest, Your Honors, that in one Skype conversation with Doctor Frumhoff, the legal representatives asked him if he can elaborate in the next public hearings, whenever that will be and wherever when he is available to be in person, so that he can respond to more questions. Because right now, by midnight, I think he will not be comfortable to take more than one question maybe.

PANEL CHAIR CADIZ:

Definitely. The next hearing is in May in Manila, but we'll be having a hearing in North America, in New York, and, perhaps, Doctor Frumhoff can testify there, where we will also have opportunity to ask questions.

DR. FRUMHOFF:

I would be very pleased to join you in New York. Thank you very much.

PANEL CHAIR CADIZ:

For your information, this will be held on…when are we conducting a hearing in New York?

CLERK OF THE INQUIRY:

September 24 to 28.

PANEL CHAIR CADIZ:

So, we will be in New York, Doctor, from September 24 to 28. We shall send you an invitation and we will also remind your counsels.

DR. FRUMHOFF:

I'd be delighted to join you. I look forward to it. Thank you so much.

PANEL CHAIR CADIZ:

Thank you. Chairman Gascon would like to field some questions for Doctor Frumhoff.

CHAIR GASCON:

Good evening Doctor Frumhoff. I am the Chair of the Commission on Human Rights here in the Philippines.

First of all, let me extend my gratitude to you for being with us this morning here, and this evening over there in New York. As was highlighted by Atty. Zelda, it's close to midnight. And that, I think, is a good framing of the situation of the environmental crisis that faces us—that we are running out of time in terms of ensuring that this crisis is addressed by all stakeholders, states definitely. And you highlighted in your presentation the responsibility of individual carbon majors. And thank you for that information. We would be grateful for additional information about how you were able to determine the individual liabilities of the specific companies.

It's normally easier for us to understand the liabilities of the larger carbon emitting states and you – one of your slides shows that very graphically with the red-colored states, but to then identify the individual responsibilities and the amounts of contributions they make per company certainly is an important data that we will appreciate. And then, perhaps, that can be presented when the Commission is able to undertake its hearings where you are in New York in due course.

I do want to highlight the last line which you marked in red at your slide. You say that these companies, in order to be responsible, must pay their fair share of climate damage and adaptation costs but you didn't elaborate how we might be able to let them or require them to pay outside of, I guess, what are normal governmental regulations like payment of taxes or, in due course, the imposition of administrative penalties by regulatory agencies like the EPA, assuming it isn't abolished by the Trump administration and so on.

But I think your comment is that there should be some kind of a formula by which that fair share you referred to might be determined and we'd be interested to find out if there is discussion about that beyond the issues of imposition of taxes, fines, or penalties, or some other mechanism and in particular, as it relates to this current Inquiry, if there is a mechanism to determine whether these companies have a share in the impact, not just of emissions per se, but the share of the impact on specific damage caused to particular communities. You showed that slide after Typhoon Harvey, in Texas, where a group said there that they should pay their fair share.

But then, that's actually the problem we're facing: the nexus behind the individual damage—whether it's the impact on the poor people in Texas by Typhoon Harvey or the impact on the poor people in the provinces impacted by Typhoon Yolanda or Haiyan as it was known internationally—to these specific companies, to the activities that they had undertaken over the last few years, and whether that it is, in fact, possible to quantify those activities that have led to or resulted in these specific damages in these instances and, therefore, should be made to pay their fair share of that damage. How might we understand that or develop the mechanism or formula for it?

DR. FRUMHOFF:

Well, that's a very big and central question, of course, and I don't want to pretend to know that I have a singular answer and it's one that I'd be happy to discuss with you further in New York, for example, in late September.

I would say that one element that's very important to be able to strengthen its application in places like the Philippines experiencing such damage from extreme events and particularly from typhoons is to ensure that the kind of attribution science work that's taking place predominantly in the industrialized world—unfortunately, it's the nature of how these things tend to happen but don't need to happen—so that, as I mentioned at the beginning of my talk, we can actually now quantify how much of the damage from Harvey was exacerbated by climate change. Typhoons happen, cyclones happen. But to the extent we can actually say the risk of this particular event at this particular severity was worsened by thirty percent (30%) , fity percent (50%) that's a central dimension of piecing apart the natural from the human cause for which we can then have a legitimate policy conversation about by what mechanism should the additional cost that was resulting from climate change be apportioned among major entities. And there are, I think, a variety of mechanisms that need to be explored. Some perhaps, through the international mechanisms that fall under the Paris Agreement, some perhaps resulting from national policies, some perhaps resulting from lawsuits, such as we're seeing in the United States. And they need to be explicitly considered. But I would say that a starting point is the recognition such as you're fostering through this public hearing that companies have actually contributed to the problems and that it's society's legitimate question to state: Why should they not pay their fair share? Why should that burden fall only on the disenfranchised communities most affected by extreme events? And sort of socializing that notion informed by science is in my view the platform upon which specific policy mechanisms for identifying how they should contribute will get established. And so I think the work you're doing in this

context is a central building block towards coming up with those mechanisms that we all need to find.

CHAIR GASCON:

Thank you very much. And we would appreciate if you could refer us to additional studies or work that's being done in terms of what you referred to as the attribution science and the socialization of the costs and, in particular, I agree with you, the reality is that the communities most affected are the ones that are often left holding the proverbial bag with tremendous burdens on them and it's very sad to note that often these are the poorest communities because they are the most vulnerable.

DR. FRUMHOFF:

Thank you.

PANEL CHAIR CADIZ:

Atty. Soriano, do you have other questions for your witness?

ATTY. SORIANO:

Nothing further, Your Honor. I think that one question would be a good question for a midnight conversation with Doctor Frumhoff.

DR. FRUMHOFF:

Thank you all.

PANEL CHAIR CADIZ:

Thank you, Doctor.

ATTY. SORIANO:

May we now be excused, Your Honor, at least, for Doctor Frumhoff?

PANEL CHAIR CADIZ:

Yes. Clerk, do you have other witnesses? What's on our schedule for this morning?

CLERK OF THE INQUIRY:

Sir, that this the last witness scheduled for this morning, Your Honor. Your Honor, I move that we adjourn for one hour.

PANEL CHAIR CADIZ:

Okay, lunch, and we shall be returning….

CLERK OF THE INQUIRY:

At 1:02PM.

PANEL CHAIR CADIZ:

Alright. Thank you very much. Session is suspended.

[Bangs gavel]

[One-hour break]

CLERK OF THE INQUIRY:

All rise. The Commissioners comprising the Inquiry Panel are:

1. Honorable Commissioner Leah C. Tanodra-Armamento
2. Honorable Commissioner Gwendolyn Ll. Pimentel-Gana
3. Inquiry Panel Chairman of the NICC, Honorable Commissioner Roberto Eugenio T. Cadiz
4. Honorable Commissioner Karen S. Gomez-Dumpit

The Honorable Inquiry Panel Chairman Commissioner Roberto Eugenio T. Cadiz still presiding.

PANEL CHAIR CADIZ:

[Bangs gavel]

Are you ready with your fourth witness?

ATTY. SORIANO:

Yes. Good afternoon, Your Honors. May we make a manifestation first, Your Honor?

PANEL CHAIR CADIZ:

Go ahead.

ATTY. SORIANO:

This morning, in connection with the resource persons from the local communities, we did a summary translation for the benefit of the audience. We would like to know from the Honorable Commissioners if that is something that you want us to continue doing or, subject of course to the submission of a formal translation after the proceeding.

PANEL CHAIR CADIZ:

Alright. What we can do is we can just wait for the (better) prepared translation, although you said you were able to do the translation already…

ATTY. SORIANO:

Oh, we will have a summary translation after the…

PANEL CHAIR CADIZ:

No, we'll just wait, give you time to…because even this afternoon I understand some of the resource persons will be giving their testimonies in [a] local dialect…

ATTY. SORIANO:

Tagalog. In the vernacular.

PANEL CHAIR CADIZ:

Maybe what we can do is for you to translate all of these and submit them at once, probably next month after the Holy Week.

ATTY. SORIANO:

Yes.

PANEL CHAIR CADIZ:

Alright, so that it won't be confusing, you'll have some kind of translation now and then a more formal... Let's just have one official translation for everything, which we will also mark in exhibit… as the statement of the first witness was marked as Exhibit M.

ATTY. SORIANO:

Yes, submark is…

PANEL CHAIR CADIZ:

How many pages? Okay, maybe what we can do is translations can be marked as M to M dash whatever. Okay.

ATTY. SORIANO:

Yes, Sir.

PANEL CHAIR CADIZ:

Just to distinguish, they're both Exhibits M. But one is just M and one is M-2, being the English translation.

ATTY. SORIANO:

Okay.

PANEL CHAIR CADIZ:

Okay, so…

ATTY. SORIANO:

So, may we continue now?

PANEL CHAIR CADIZ:

Okay.

ATTY. SORIANO:

Our next witness, Your Honor, is Mr. Felix "*Ka Jun*" Pascua, Jr. and can we call him now?

PANEL CHAIR CADIZ:

May we request our clerk to swear in the witness?

CHR LEGAL OFFICER:

Please raise your right hand. Do you swear to tell the truth, the whole truth, and nothing but the truth in this National Inquiry under pain or penalties under the law?

MR. PASCUA:

Opo. (Yes.)

PANEL CHAIR CADIZ:

Proceed, counsel.

ATTY. SORIANO:

Thank you, Your Honor. We are offering the testimony of Mr. Felix Pascua, Jr. who is the head and the national spokesperson of *Pambansang Katipunan ng Makabayang Mambubukid*, in order to share the concerns of the farmers in relation to climate change impacts. For the manifestation, Your Honor, I also requested if I can ask him the preliminary questions in English but his statement will be done in the vernacular.

PANEL CHAIR CADIZ:

Alright, go ahead.

ATTY. SORIANO:

So I have here, Your Honors, a document consisting of three (3) pages entitled "*Salaysay ni Ginoong Felix "Ka Jun" Pascua, Jr.* Mr. Pascua, do you recognize this document consisting of three (3) pages? It was executed on March 17, 2018, a copy of which was submitted to the Commission on Human Rights on March 20, 2018. Do you recognize this document?

MR. PASCUA:

Nare-recognize *ko po*. (I recognize it.)

ATTY. SORIANO:

And then, on the third page of this document is a signature above the name "Felix 'Ka Jun' Pascua, Jr." May we know from you whose signature is this?

MR. PASCUA:

Kinukumpirma ko po. (I confirm it.)

ATTY. SORIANO:

Now, Mr. Pascua, do you confirm and affirm the contents of this three (3)-page statement?

MR. PASCUA:

Opo. (Yes.)

ATTY. SORIANO:

Your Honors, please, may I proceed now to have…

PANEL CHAIR CADIZ:

Let's have it marked first.

ATTY. SORIANO:

Yes.

PANEL CHAIR CADIZ:

Atty. Esguerra, please mark this exhibit as Exhibit…

ATTY. SORIANO:

As Exhibit U.

PANEL CHAIR CADIZ:

U, U-1, and U-2, the second and third page. And then the signature as U-3-A. I'm sorry, three (3) pages?

ATTY. SORIANO:

Yes, Your Honor.

PANEL CHAIR CADIZ:

So U, first page. U-1, the second page. U-2, the third page. And U-2-A, the signature on the third page. Just a correction.

ATTY. SORIANO:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Okay.

ATTY. SORIANO:

Thank you, Your Honor. And, at this point Mr. Pascua will now give a statement.

PANEL CHAIR CADIZ:

Please go ahead.

MR. PASCUA:

Magandang hapon po sa lahat po ng kinatawan ng Commission on Human Rights *at saka sa lahat po na nandirito, magandang hapon.*

Ako nga ho pala si Felix "Ka Jun" Pascua, Jr. Kung tawagin po ako ng aking mga kamagbubukid ay "Ka Jun" saan man ako pumuntang mga lugar. Isang lehitimong anak ng magbubukid na tubong Nueva Ecija na kasalukuyan ay naitalagang lider-magbubukid, kung saan parang national spokesperson *po ako ng aming organisasyon. Ito yung Pambansang Katipunan ng Makabayang Magbubukid. Ang adbokasiya ng aming organisasyon ay ang repormang agraryo, o yung sana walang magsasaka na walang sariling lupa, organikong pagsasaka, at saka yung sustinableng agrikultura. Yun po yung mga adbokasiya ng aming organisasyon.*

Batid namin na, bilang magsasaka, nagdala ako ng palay. [Resource person showing object evidence of rice stalks.] *Itong palay na ito lagi kong dala-dala minsan kapag nagsasalita ako kasi bilang magsasaka, itong palay na ito ay simbolo ng aming pag-asa, simbolo na kung saan parang daan namin ito para makamit yung aming mga pangarap. Bagamat siguro batid natin lalo na nitong mga nakakaraan, mainit na pinag-uusapan ang pagkakaroon ng isyu sa krisis sa bigas.*

*Ang gusto kong isalaysay sa hapong ito ay yung usapin kung paano ba kaming magsasaka ay naapektuhan o ano yung kaugnayan ng aming pang-araw-araw na buhay doon sa sinasabing pagpapalit ng klima sa kasalukuyan. Bagamat kaming mga magsasaka, hindi naman kami matatalinong mga tao kaya minsan hindi namin kagyat na mai-*relate *yung sinasabing* climate change.

Ganito ko lang po, gustong bigyan ng salaysay yung kalagayan ng pagsasaka namin. Nung bata pa ako, mga walong (8) taon siguro, nagsasaka na kami. Noon, nakakaranas rin kami ng mga kalamidad. Pero syempre ang magandang gusto kong ipakita rito, noong, noong unang panahon, saksi ako doon sa buhay namin ng mga tatay at lolo ko. Isang beses lang kaming nagtatanim noong araw. Sa isang season, *pagka magtatanim kami, halimbawa, ng buwan ng Marso o kaya naman yung tag-araw yung may* main

crop *na sinasabi, magpupunla na kami karaniwan ng buwan ng Marso, Abril magtatanim na, Mayo, hanggang dun sa ganun.*

Tapos dalawang (2) season kasi yan. Kaya lang, yung una, ito, yung sinasabi ko nga na noong unang pahanon, isang season *lang, nag-aabot yung aming inani eh. Kaya pagka umani kami, isa (1) na lang yun, kaya parang kung magtatanim ulit kami, yung aming inani ay sumasapat para sa buong proseso ng buong panahon kasi apat (4) na buwan po yan bago mag-ani. Noong araw, isang (1) beses lang naman kami o isang (1)* season *lang, isang* cropping *lang maganda na yung sitwasyon. Kaya lang, pag dating siguro, ako ang recollection ko, mga buwan ng mga 1980s, mga lampas siguro dyan, 1990s hanggang sa kasalukuyan batid po ng lahat nagdadalawang* cropping *na.*

Pero ang magandang gusto kong ipakita rito, bakit noong unang panahon, isang season *lang naman kaming nagtatanim pero bakit ngayong nakakadalawang* season *na kaming nagtatanim—at minsan nga nagtatatlo pa, meron pang nagtatatlo, halos walang pahinga yung lupa—nakikita namin ang malaking pagbabago ng agrikultura o ng aming buhay. Unti-unti kaming nasasadlak sa matinding kahirapan. Pagka-utang, na ang epekto nga karaniwan nito ay nangyayari pa, halimbawa, sa akin, aktwal na nangyari sa amin ito—mula sa pagsasaka, nakalamidad yung aming pananim. Ang kapital kasi ng isang ektarya ay kwarenta mil (40,000). Walang kakayahan yung magbubukid na makabangon sya ulit para sa panibagong* season*. Kung meron syang utang na kwarenta mil (40,000) dahil nakalamidad, mangungutang ulit sya ng panibagong apatnapung libo (40,000), kaya talagang natural na mababaon ka sa utang.*

*Pero ang gusto ko pong ipakita po rito ay yung pagkakaiba noon hanggang sa kasalukuyan. Yung unti-unting pagbabago nga na parang noong una sa mga kanayunan, hindi naman kagyat na maipakita at mai-*relate *ng matatandang magbubukid na yan ay* climate change *kasi hindi naman naririnig gaano sa kanayunan ang* climate change*. Sa amin kung tawagin po yan ay mukhang nag-uulyanin na ang panahon. Kaya nga minsan kapagka nagtanim kami doon sa panahon ng sinasabi kong* main crop*, na yung pag-ani ay sa panahon nga karaniwan ng Nobyembre o Disyembre, itong panahon kasi ho na ito yung tagbagyo pero ang nare-*recall *ko nga, noon ay may bagyo naman pero hindi gaanong malalakas ang bagyo noong araw. Mayroon namang baha, pero hindi naman gaanong katindi ang baha. Mayroon ding tagtuyot pero, hindi gaanong katindi ang tagtuyot.*

Kasi yung sinasabi kong main crop *kanina ang anihan po kasi noon ay Nobyembre, Disyembre. Yung* second crop *kasi noon ang anihan doon ay yung Marso, Abril. Ito po ay ani ngayong buwan ng Marso. Mamaya*

ipapaliwanag ko ano yung kaugnayan ng palay na ito doon sa pagbabago ng klima. Kaya parang ang gusto ko hong tingnan at maganda sigurong makita, mula doon sa pagbabago na yun otsenta (80) kaban yung dating main crop *namin, otsenta (80) kaban hanggang nobenta (90) kaban. Pero mabilis yung pagbabago ng panahon, eh kapagka titingnan mo ngayon, sa kasalukuyan, yung otsenta (80) namin hanggang nobenta, karaniwan sesenta (60) kaban na lang, o minsan nga, ang malungkot dito, singkwenta (50) kaban na lang yung inaani namin. Eh di ang laki nung pagbabago nung nawawala, diba?*

Alam namin na ang pagbabagong ito, lalo na yung sa main crop*, ito yung panahon na talagang sumusugal ka na sa pagsasaka. Ang ibig kong sabihin, ang buwan kasi ng Oktubre at Nobyembre ay panahon ng tagbagyo, yun nga yung sinasabi ko na hindi naman ganyan ang bagyo noong araw. Talagang ngayon kasi iba na, kaya parang ang gusto kong ipakitang pagbabago ng malaki ay yung pagsasaka noon na nakaka-isa kami, ngayon ay nakakadalawa, pero makikita namin yung mas lalong pagkabaon namin sa kahirapan na hanggang sa nababawi pa yung aming lupa.*

*Madali ding ipakita o gusto rin namin ipakita yung laki kaagad ng pagbabago ng aming ani mula sa otsenta (80) hanggang nobenta (90), ngayon ay sesenta (60) hanggang singkwenta (50) kaban na lang. At ang masaklap nga dyan, baka hindi lang yung treinta (30) kaban yung nawawala. Minsan nga, halimbawa, ang gusto kong i-*relate *na karanasan, nito lamang 2015, yung matinding bagyo na sumalanta sa* Central Luzon*. Ang dineklara ng ating pamahalaan ay* ninety percent (90%) totally damaged *yung lahat ng aming mga pananim. Eh di ibig sabihin hindi yung animnapung kaban yung aming inani. Kung ang* average *noon ng isang ektarya ay otsenta (80) , dahil* ninety percent (90%) *yung na-*wash out*, ang na-*wash out *po sa aming pananim o yung aming inani ay yung halos setenta (70) kaban at yung halos sesenta (60) kaban at ang natira lamang sa amin ay yung sampung (10) kaban.*

Syempre malaking tanong sa aming mga magbubukid, sino ang pwede naming sisihin sa ganitong kalamidad sa kasalukuyan? Minsan nga, may mga magbubukid, may mga matatandang magbubukid na sinisisi ang Diyos. Sinisisi nya ang Diyos dahil dapat daw hinarang ng Diyos yung bagyo at saka yung baha.

*Kaya kanina ng may nag-*present *parang nakakarelate ako. Makikita ko din yung papel ng mga* multinational *na korporasyon. At syempre sa aming mga lider, nakikita namin yan pero yung ilang mga magbubukid namin sa kanayunan, hindi kagyat na nakikita yan.*

Tulad halimbawa nito, [Resource speaker pointing to rice stalks he is holding]. *parang sa panahon ito kasi anihan na ho sana ngayong buwan ng Marso. Di ho ba dapat itong palay na ito masaya mong ginagapas kasi dapat po ito nakayuko ito. Nakayuko dapat itong palay na ito kasi aanihin. Kaya sya nakayuko dapat busog yung kanyang uhay. Pero titignan nyo ho, nakaturol. Bakit?*

Aanihin na ho dapat sya ng Marso pero inabot ng tagtuyot. Kaya sya nakaganito pag itinahip mo ito, lahat ito lilipad ng hangin. Ibig sabihin, halos wala kang aanihin. Wala kang aanihin kasi ito lang halos yung may laman. Itong mga uhay tulyapis na.

Nakakalungkot dahil pag-asa sana ng mga magsasaka na sa panahon ng second crop *nya ay aani sya ng maganda, pero dahil inabot ng tagtuyot, wala na syang aanihin. Nakakalungkot itong sitwasyon na ito na sabi naming, kaming mga magbubukid na syang lumilikha ng pagkain ng bansa, kaming magbubukid na sya sanang mayroong pagkain at tiyak na makakain, pero nangyayari kaming magbubukid ang walang makain.*

At ang malungkot pa nga nito, nawawala pa yung aming bukid. Kaya parang unfair *sa amin ngayong pinag-uusapan natin yung sinasabing pagbabago ng klima. Kaming mga magbubukid wala namang kontribusyon. Parang minsan hinahanap namin kung ano ang kontribusyon namin sa pagkasira ng kalikasan. Parang wala naman kaming kontribusyon.*

Ang nakikita namin, minsan nakakadalo ako sa mga seminar, *parang ito ay dulot ng patuloy na pagbuga ng usok ng mga multinasyonal na korporasyon. Parang* unfair *dahil wala kaming kontribusyon pero ang naninira, walang hinangad kundi ang dambuhalang tubo at kita. Pero kami ngayon ang walang makain, hindi naman mapag-aral ang aming mga anak, at nakukuha pa ang aming lupa bunga ng pagkabaon sa utang dahil nga nasalanta ng kalamidad.*

Bilang mga magsasaka, tingin namin napakatindi ng impact *ng pagbabago ng klima. Sa totoo lang, parang wala nang magulang na gusto nyang ipasa ang pagiging magsasaka sa kanyang anak. "Anak, wag na wag ka nang magsaka, wala kang aasahan dyan." Nakakalungkot dahil kung ganito ang mangyayari at hindi natin maisasalba yung ating mundo, yung ating kalikasan, subukan siguro nating i-*imagine *yung bansa na wala ng magsasaka pag dating ng araw. Anong kakainin natin, eh lalo pa tayong mga Pilipino ang* staple food *natin palay, bigas.*

Ang gusto kong pinakadulo ng aking mensahe—kaya natutuwa akong naimbitahan kami sa pagtitipong ito—para maisiwalat. Kami ho kasi naniniwala na ang batayan ng tao para magkaroon ng karapatan para mabuhay ay mayroon syang pagkain, mayroon syang lupa, mayroon syang bahay. Kapagka inalis yan sa tao, inalisan sya ng karapatan para mabuhay. Kaya gusto kong idugtong yung mahalagang bagay na yun sa karapatang pantao naming mga magsasaka na magkaroon ng tiyak na makakain, tiyak na masasaka, at tutulugang bahay. Pero yun nga, ang sinasabi ko, bunga ng pagbabago ng klima sa ngayon, nawawalan kami ng kakainin, nawawalan kami ng lupa, nawawalan pa nga kami ng tahanan. At saksi ako sa nangyari sa Reyna, General Nakar. Sayang di ko dala yung picture*, pero magugulat ka sa epekto nya, na kung saan libo ang namatay.*

Yun lang po, at maraming salamat. Magandang hapon po.

ENGLISH TRANSLATION OF THE TESTIMONY OF MR. PASCUA (TRANSLATION DONE AFTER HEARING)

Good afternoon to everyone, to all the members of the Commission on Human Rights, and to everyone who are here, good afternoon. I am Felix "Ka Jhun" Pascua, Jr. My fellow farmers call me Ka Jhun in every place I go to. A legitimate son of a farmer who hails from Nueva Ecija, currently appointed as farmer-leader or National Spokesperson of our organization, the National Union of Patriotic Peasants.

Our organization's advocacy is agrarian reform, that we hope no farmer should be landless, organic farming, and sustainable agriculture. These are the advocacies of our organization. We know that as a farmer, I brought with me rice grain. This rice grain I always bring it with me every time I speak because as a farmer, this rice grain represents our hope, represents our way of attaining our dreams although, perhaps, we know, especially recently, the current rice crisis is being heatedly discussed.

What I want to share to you this afternoon is the topic on how we, farmers, are affected or what is the relation of climate change to our daily lives. Although we, farmers, are not too intelligent people that is why we cannot easily relate to what they call climate change. This is how I want to give testimony on our plight as farmers.

When I was young, approximately eight (8) years old perhaps, we were already farming. Before, we also experienced calamities but, of course, what I wanted to show here, back then, I was witness to our lives with my father

and grandfather. We only plant once before. In one season, we will germinate the seeds in March for example, April we will plant, until May at that time… because there were two seasons. But the first one, this is what I am saying that back then, there was only one season. Our harvest was sufficient. That is why if we harvest it was just once and if we were perhaps going to plant again, our harvest is enough for the whole season, because it took four (4) months before the next harvest. That is why, back then, we only did it once, or one cropping only, the situation was already good.

But beginning… my recollection in the 1980s, even beyond that, 1990s up to the present, everyone knows there were two (2) croppings already. But what I want to share with you here is why before we only planted once, but now we plant for two (2) seasons, and sometimes thrice, the land is no longer recovering, we see these big changes in agriculture and in our lives. We are gradually dragged into extreme poverty and debt. The normal effect of this, this happened to me in real life, our farm was hit by calamity, and the capital of one (1) hectare is Forty Thousand Pesos (PhP 40,000.00). The farmer has no capacity to plant again for another season if he has a debt of Forty Thousand Pesos (PhP 40,000.00). Because he was hit by calamity, he will make a loan again for another Forty Thousand Pesos (PhP 40,000.00) that is why you will surely be heavily indebted.

But what I want to show to you here is the difference between before and the present, the gradual changes, that like before in the countryside the old farmers cannot show or relate climate change because climate change is not usually heard in the countryside. For us we usually call it "the weather is getting senile." When we plant the main crop, the usual harvest happens in November or December. That season now is the typhoon season, but I recall before even if there was a typhoon, the typhoons back then were not that strong. There was also flooding, but the flooding was not that heavy. There was also drought, but the intensity was not that much. Because the main crop I mentioned earlier, the harvest season is November-December; the second crop is being harvested March-April. This is the harvest for this month of March. Later I will explain the connection of this rice grain with the changes in climate.

That's why what I want to look at and it is nice to see the changes through the years. We harvested eighty (80) cavans for our main crop before, eighty (80) cavans to ninety (90) cavans. Because of the the rapid changes in the climate, currently, our eighty (80) cavans before have now gone down to sixty (60) cavans only. What is more unfortunate is sometimes we only harvest fifty (50) cavans. That's a huge loss, isn't it? We all know these changes, especially in the main crop, because this is the season that we really gamble on farming—what I meant was that the months of October and November are

typhoon months. That is why we say that typhoons are not the same as before, now it is different. What I want to show is the big change—before we only planted once, now we plant twice but we are still in deep poverty and we even lose the lands we till. We also want to show the huge difference of our harvest, from eighty-ninety (80-90) to fifty-sixty (50-60) cavans only.

Worse, it might not just be the thirty (30) cavans that are lost. The experience that I want to share, it just happened recently in 2015 where the strong typhoon that hit Central Luzon. The government declared that ninety percent (90%) of what we planted were totally damaged, which means we did not harvest sixty (60) cavans. If the average in one hectare is eighty (80) cavans, because ninety percent (90%) was washed out, what was washed out from what we could have harvested is approximately seventy (70) cavans and what was left to us was just ten (10) cavans. Of course, this is a big question for us farmers, who do we blame for these calamities that we suffer? Sometimes the old farmers blame God—they blame God because God should have blocked the typhoon and the flooding. That is why when someone presented earlier, I could relate, I could see the role of the multi-national corporations. Of course, us, leaders, we can see that, but some farmers in our town cannot easily see that.

For example this (rice grain) should have been harvested this month of March. This rice grain should have been harvested gleefully because it should be bending—the rice grain should be leaning forward because it will already be harvested, it is leaning forward because its grains are full. But look at it, it is upright. Why? It should have been harvested in March, but it was hit by drought. That is why it looked this way. If you will hold this, it will all be blown away by the wind. It means that most likely you will not harvest anything, because only this portion is somewhat full, the others are dry. It is sad because farmers were hoping that on the season of the second crop, they will harvest good, but because it was hit by drought, there is none to harvest. This situation is saddening because we, farmers, who create food for the country, we, farmers, have nothing to eat, and what is even more disheartening, we lose our farms.

That is why it is unfair for us when we talk about climate change, we farmers think that we do not contribute to it. What is our contribution to the destruction of our environment? It seems like we do not have any contribution. What we see, when I was able to attend seminars, it was caused by the continued emission of fumes of multinational corporations. It is unfair because we do not contribute to the changing climate, but those who destroy desires nothing but big profits. But here we are, we do not have anything to eat, we cannot send our children to school, and our farms were taken away from us due to heavy debts because we were hit by calamity.

That is why we farmers think that the impacts of climate change is grave. If truth is to be told, it is like no parent-farmer wants to pass on farming to his child. "My child, do not go into farming because you cannot get anything from that." It is saddening because if this will happen and we cannot save our earth, our environment… Let us try to imagine a country without farmers in the future. What are we going to eat? Especially us, Filipinos, our staple food is rice. The last part of my message is that I am happy that we were invited to this gathering to expose… We believe that the foundation of the right to life is having food, land, and decent housing. If you take these away from a person, you take away his right to live. I want to add this important thing, that it is our human right as farmers to have secure food, secure land to farm, and house to sleep. But because of the current climate change, we lose food to eat, land to till, and house to live in. And I am witness to what had happened in Reyna, in General Nakar. It is unfortunate that I was not able to bring the picture, but you will surely be shocked by the effects; thousands died. That is all, and thank you very much and good afternoon.

ATTY. SORIANO:

Maraming salamat po Mr. Pascua, Ginoong Pascua. (Thank you very much, Mr. Pascua). Your Honor, may we be allowed just one question?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. SORIANO:

Mr. Pascua, napag-uusapan nyo rin ho ba sa inyong samahan kung anong nakikita nyong hakbang na makakatugon kahit papano dun sa inyong suliranin na nabanggit? (Mr. Pascua, have you discussed in your organization the steps you see that will somehow solve the problems you mentioned?)

MR. PASCUA:

*Mahabang panahon na rin naming hinahanapan ng solusyon yan, yung paano mag-*aadapt *kaming mga magsasaka sa kasalukuyang pagbabago ng klima. Ang karaniwan kasi parang pwede raw bang wag na munang magtanim ng*

main crop *at mag-*second crop *na lang. Kaya lang, syempre, parang medyo mas lalong problema yun kasi para sa aming mga magbubukid, mahalaga yung* main crop *para may kainin kami. Kaya kapag hindi kami nagtanim ng* main crop*, anong gagawin namin sa* main crop*? At anong ipapakain namin sa aming pamilya? Kaya parang hindi solusyon yung hindi ka na magtanim at wag ka nang magtanim.*

Kapag naman nasalanta ka, syempre, yung gobyerno, halimbawa, nitong nangyari nga, parang kasi hindi maiiwasan ang kalamidad. Naniniwala naman po kami na may natural na kalamidad na kailangan. Bagamat, syempre, sabi ko nga, parang gulat na gulat talaga kami sa kaibahan noon. Sabi ko nga, kapag ngayon kasi, kapag nagtanim ka, kapag nagbaha nalulunod yung palay mo, yung bagong tanim nawawala. Paglipas ng tubig, wala na ang tanim. Pagka naman nailusot mo yung tanim mo at naging ganito, tagtuyot naman ang kalaban mo, mawawala.

Pangalawang punto, tungkulin sana ng gobyerno or, kanina bigla kong naisip, pwede kaya naming singilin yung sumisira sa kalikasan? Eh hindi ko alam kasi hindi naman kami nga mahuhusay sa ganyan. Parang paano kung, pero syempre, nakita ko din kanina.

Ang problema namin ilang beses na rin naming dinudulog sa pamahalaan ito. Halimbawa, noong nasiraan kami ng palay sa Nueva Ecija, ang tugon ng ating pamahalaan ito, dahil nasalanta ang aming palay, buy one, take one *na sa binhi. Pagka* buy one, take one *sa binhi, pagka isang (1) ektarya, dalawang (2) sakong binhi ng palay ang katapat ng isang ektarya mo. Bibilhin daw namin yung isa, babayaran namin, ibibigay ng gobyerno yung isa, babayaran namin yung isa. Medyo nakakalungkot din kasi,* forty thousand (40,000) *ang kapital sa pagsasaka, eh nalugi kami ng* forty thousand (40,000)*. Sasabihin sa amin ng gobyerno ay libre yung isang (1) sakong binhi.*

Pangalawang tulong ng gobyerno minsan ay mayroong tinatawag na fifty-fifty *sa abono. Walong (8) sako ng abono ang isang (1) ektarya, kapagka binanggit mong* fifty-fifty*, ibibigay nila yung apat (4), bibilhin mo ulit yung apat (4). Kaya iniisip ko o tayo na ang maghusga nun, parang binigyan kami. Nalugi kami ng apatnapung libo (40,000) pero tinulungan kami ng gobyerno ng apat (4) na sakong abono at saka isang (1) sakong binhi.*

Kaya medyo kami ngayon, nahihirapan din. Kaya yung epekto nga, inaabandona ng mga magsasaka ang kanilang mga lupa. At, yun nga, yung walang mga bata ngayon. Ang age bracket *ngayon ng mga magkakasaka mga* fifty seven (57) *pataas, walang bata. Kaya ibig sabihin walang bata na gustong magsaka.* fifty seven (57) *pataas kaya kami nakikita namin na in*

danger o nasa panganib ang agrikultura ng ating bansa kasi damaged *yung ating agrikultura, walang aasenso sa pagsasaka.*

(We have been looking for solutions for a long time, how we, as farmers, are going to adapt to the current changes in the climate. The normal suggestion was, is it possible that we do not plant main crop and do second crop instead? But it seems to be more of a problem because for us farmers, the main crop is important for us to have something to eat. That is why if we do not plant the main crop, what are we going to do with the main crop, and what are we going to provide as food for our families? That is why not planting seems not to be a solution. If you were hit by a calamity, the government… it is likely that calamities cannot be avoided, we also believe that there are natural calamities needed. But, of course, we are really shocked by the difference. Now if it floods, the crops will drown. When the water subsides, your crops are gone. If you are able to save them, drought is your next challenge.

Second point, it should be the government's responsibility or… a while ago, I was thinking, can we seek compensation from those who destroy the environment? I do not know because we are not knowledgeable in these things, on how to do it. But, of course, our problem, we have brought these up to our government several times. For example, when our crops in Nueva Ecija were damaged, the government's response, our crops were damaged, the seeds were sold on a buy one-take one basis. In one (1) hectare, two (2) sacks of seeds are needed for your one (1) hectare. The government will give one (1) sack; we will pay for the other. It is sad because Forty Thousand Pesos (PhP 40,000.00) is the capital for farming, one (1) hectare, and we already lost Forty Thousand Pesos (PhP 40,000.00), and the government will tell us that what is only free is one (1) sack of seeds. Another help that the government provides sometimes is what they call fifty-fifty (50/50) for fertilizer. We use eight (8) sacks of fertilizers for one (1) hectare and when you say fifty-fifty (50/50), they will give four (4), you will buy the other four (4), that is why I thought let us be the judge of that scheme. We lost Forty Thousand Pesos (PhP 40,000.00), but the government gave us four (4) sacks of fertilizers and one (1) sack of seeds. That is why we are now having difficulty. That is why the effect is that the farmers abandon their lands and there are no young people currently farming. The age bracket of farmers today is fifty seven (57) and up, no young farmers who want to still farm. We see that the agriculture industry in this country is in danger because our agriculture is already damaged, and there is no progress in farming.

ATTY. SORIANO:

Maraming salamat po, Mr. Pascua. (Thank you very much, Mr. Pascua.) That will be all from our side, unless the Honorable Commissioners would like to ask questions.

PANEL CHAIR CADIZ:

Thank you very much, counsel. Do any of the panel members wish to…

Alright. We might recall you at a later date, but for now there will be no questions to the resource person.

ATTY. SORIANO:

Thank you.

MR. PASCUA:

Salamat po. (Thank you.)

PANEL CHAIR CADIZ:

We can now proceed with your fifth witness, Counsel.

ATTY. PAUDAC:

Good afternoon again, Your Honors. Your Honors, may we call on our fifth witness, resource person, Ms. Rosalina De Guzman?

PANEL CHAIR CADIZ:

May we have this witness sworn in?

CHR LEGAL:

Please raise your right hand. Do you swear to tell the truth, the whole truth, and nothing but the truth in this hearing?

PANEL CHAIR CADIZ:

Counsel, you may proceed. Okay, witness….

ATTY. PAUDAC:

Your Honors, Ms. Rosalina De Guzman is a graduate of BS Chemical Engineering from Mapua Institute of Technology and Master's in Environmental Management from Philippine Women's University. She currently holds the position of Assistant Weather Services Chief and Chief Climate and Agrometeorology Data Section of the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAG-ASA).

Your Honors, we are offering the testimony of Ms. Rosalina De Guzman for her to share the highlights of a study which she co-authored "Long Term Trends and Extremes in Observed Daily Precipitation and Surface Area Temperature in the Philippines for the Period 1951 to 2010." And to give us also the latest PAG-ASA information on climate change impacts.

Your Honors, before we proceed with her presentation, we have here several documents, Your Honors. May we be allowed to ask preliminary questions regarding these documents?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

Good afternoon, Ms. De Guzman.

MS. DE GUZMAN:

Good afternoon.

ATTY. PAUDAC:

Ms. De Guzman, I have here one (1) document entitled "Statement of Ms. Rosalina De Guzman" consisting of three (3) pages. Please kindly go over it and please tell me if you do recognize that document.

MS. DE GUZMAN:

Yes, this is my document.

ATTY. PAUDAC:

Ms. De Guzman, on page three (3) of the document, there appears a signature above the name 'Rosalina De Guzman' dated March 16, 2018. May I know whose signature is this?

MS. DE GUZMAN:

This is my signature.

ATTY. PAUDAC:

Thank you, Ms. De Guzman.Ms. De Guzman, do you confirm and affirm the statements mentioned in this document?

MS. DE GUZMAN:

Yes, I confirm, that is my statement, but I have some amendments to make on paragraph three (3), page two (2). I overlooked the statement I wrote on monsoons. May I correct, may I make some amendments on it?

ATTY. PAUDAC:

Sure Ms. De Guzman. I'm giving you the statement and please tell me the appropriate correction.

MS. DE GUZMAN:

So, on the second sentence, "based on historical records, the worst flood events were also due to southwest monsoon," I'd like to add "due to southwest monsoon and northeast monsoon." And the third sentence be deleted.

ATTY. PAUDAC:

Your Honors, may we move for the amendment of the said particular paragraph, paragraph three (3) of page two (2)?

PANEL CHAIR CADIZ:

Please go ahead. Ms. De Guzman, can you do the amendment yourself?

MS. DE GUZMAN:

Yes, Your Honor.

ATTY. PAUDAC:

Your Honors, we manifest that Ms. De Guzman changed the statement to appear as "I also had brief discussion on monsoons. Based on historical records, the worst flood events were also due to southwest monsoons and northwest monsoon."

MS. DE GUZMAN:

Northeast.

PANEL CHAIR CADIZ:

And there was a portion that's supposed to be deleted?

ATTY. PAUDAC:

Yes.

PANEL CHAIR CADIZ:

Has it been properly deleted?

ATTY. PAUDAC:

Yes, Your Honor, the sentence "Recently, however, northeast monsoons also caused severe flooding" was also deleted. And Ms. Rosalina De Guzman countersigned this document.

PANEL CHAIR CADIZ:

Alright, so we can have it properly marked already, Atty. Esguerra.

ATTY. PAUDAC:

Yes, Your Honor.

PANEL CHAIR CADIZ:

So, this document will be marked as Exhibit V.

ATTY. PAUDAC:

Yes, Your Honor.

PANEL CHAIR CADIZ:

So, page one (1) will be Exhibit V. Page two (2) will be Exhibit V-2, no, page two (2) will be V-1, then page three (3) will be V-2 and the signature will be V-2-A. This is just a peculiar marking under Philippine jurisprudential practice. Others have different kinds of markings but we do mark all the first pages, the first letter and then the subsequent ones with a dash of that letter. So: V and then V-1, V-2.

COUNSEL FOR PETITIONERS:

(inaudible)

PANEL CHAIR CADIZ:

No more, no…the corrections are not being marked as exhibits. So, proceed, Counsel.

ATTY. PAUDAC:

Thank you, Your Honor. Ms. De Guzman, in your statement, you mentioned two annexes, annexes A and B. Annex A is a document entitled "Long Term Trends and Extremes in Observed Daily Precipitation and Surface Area Temperature in the Philippines for the period 1951 to 2010" consisting of fifteen (15) pages. Please kindly go over it and tell me if you do recognize the document.

MS. DE GUZMAN:

Yes, this is our document published in the peer-reviewed journal.

ATTY. PAUDAC:

Do you confirm and affirm the contents of this document, Ms. De Guzman?

MS. DE GUZMAN:

Yes.

ATTY. PAUDAC:

Your Honors, may we request that this document be marked as our Exhibit W series, Your Honor?

PANEL CHAIR CADIZ:

Alright, Atty. Esguerra, please mark as requested. Is there a signature in that document? No?

MS. DE GUZMAN:

No.

PANEL CHAIR CADIZ:

Is there authorship?

MS. DE GUZMAN:

Yeah, there's authorship.

PANEL CHAIR CADIZ:

There's a signature on the last page? Alright. Exhibit W. First page is Exhibit W, the last page is Exhibit W-14. Counsel, proceed.

ATTY. PAUDAC:

Your Honors, in the same statement, you also appended a Curriculum Vitae consisting of five (5) pages. I will show you this document and please kindly go over it and tell me if you do recognize the document.

MS. DE GUZMAN:

Yes, this is my document.

ATTY. PAUDAC:

Do you confirm and affirm the contents of this Curriculum Vitae, Ms. De Guzman?

MS. DE GUZMAN:

Yes.

ATTY. PAUDAC:

Your Honors, may we request that this curriculum vitae of Ms. Rosalina G. De Guzman be marked as our Exhibit X series, Your Honor?

PANEL CHAIR CADIZ:

Consisting of how many pages?

ATTY. PAUDAC:

Five (5) pages, Your Honor.

PANEL CHAIR CADIZ:

Atty. Esguerra, please mark so.

ATTY. PAUDAC:

And, finally, in your statement, you mentioned that you will be having a PowerPoint presentation, Ms. De Guzman. I'm showing to you a document—kindly please go over it—entitled "Observed Climate Trends and Projections in the Philippines."

MS. DE GUZMAN:

Yes, this is my presentation this afternoon.

ATTY. PAUDAC:

Do you confirm and affirm the contents of this PowerPoint presentation, Ms. De Guzman?

MS. DE GUZMAN:

Yes.

ATTY. PAUDAC:

Your Honors, may we request that this document entitled "Observed Climate Trends and Projections in the Philippines" by Ms. Rosalina G. De Guzman be marked as our Exhibit Y series consisting of twenty five (25) pages, Your Honors?

PANEL CHAIR CADIZ:

Atty. Esguerra, please mark... Y to Y-24. Counsel, please proceed.

ATTY. PAUDAC:

Now, Your Honors, Ms. De Guzman is already prepared to have her presentation on the highlights or summary of her PowerPoint.Ms. De Guzman?

MS. DE GUZMAN:

Okay. Good afternoon, everyone respected commissioners, audience. I'd like to present to you the "Observed Climate Trends and Projections in the Philippines". I'm Rosalina de Guzman, I'm the chief of the climate and Agromet Data Section, and I have been in PAG-ASA for the past thirty three (33) years already. And I'm a climatologist.

Next please. So today, this afternoon, I'll be providing you with some background information on why the Philippines is vulnerable to the impacts of climate change, what are the observed trends in our current climate, what are the climate anomalies that we have observed, and what do we expect in the future. So, fifty (50) years from now or the end of the 21st century, we will see what climate we will expect in the future.

Next please. The Philippines is highly vulnerable to the impacts of climate change and, in fact, the World Index Report in 2016, we ranked number three (3) in terms of exposure and vulnerability. Ranking number one is Vanuatu and Tonga, and we ranked third. This is because the number of tropical cyclones, also, the number of disasters that is being experienced by our country.

Next please. The Philippines is highly susceptible to floodings and inundation because basically we're archipelagic and we have many low-lying small islands. In fact, seventy percent (70%) of our cities and municipalities are located in coastal areas. We have one of the longest coastlines in the world, which makes us susceptible to floodings and storm surges.

So, next please. So, what has changed? Next please. So, we will discuss what has changed in terms of temperature. Next please. I'd like to walk you through to the global temperature from 1980 up to 2016. So, you could see how much of the globe has warmed during the last hundred years. Can you play it so you could see in 1880 or before hundred years, you could see that the temperature of the world is relatively colder, cooler? And you can see the progression in terms of increasing temperature. So this data is from 1880 to around 2016 and you can see that the globe that we live now is very warm. And you could see that the warmest temperature observed over the poles. The temperature Doctor Gerry Bagtasa of UP presented a while ago in the morning, the trend in terms of the temperature of the world has increased by about point eighty five degree centigrade (.85°C) during the last hundred years.

What [does] this means to us? For example, maybe we could just compare body temperature. If our body temperature increases by point five (0.5), we have a slight fever, and then if you have a one degree for example, thirty eight degrees (38°) "Oh, your fever is not good." So worse, it's worst. But if the world experienced a two (2) to four (4) degree centigrade increase in temperature, the world can no longer take this. And many of our species in the world cannot adapt, our people cannot adapt, if we experience this kind of temperature in the future.

So, let us see now the observed temperature in the Philippines. So, in the Philippines we have data from 1951 up to 2015 and we analyze in terms of the mean annual temperature. So, you could see that for the past sisty five (65) years, the temperature of the Philippines has increased by point sixty eight degree centigrade (.68°C). Comparing it to the global which I have shown earlier, the global temperature increased during the last hundred years by point eighty five (.85). Ours is sixty five (65) years and we already reached point sixty eight degrees centigrade (.68°C). And in terms of maximum temperature, the annual maximum temperature is lower. The temperature we usually measure during the hottest time of the day. The maximum has increased by point twenty four degree centigrade (.24°C) but what's alarming is the minimum temperature. It has increased by about point niety nine (.99), almost one degree centigrade (1°C). And according to scientists, if there is a one degree increase in night time temperature, the minimum temperature, there is a decrease of ten percent (10%) in agricultural yield. And maybe you could also notice that our night time temperature is now relatively higher. You will feel that it is relatively warm because if you look at the number of warm days and warm nights, it has increased over the last sixty five (65) years.

The… next please. In the Philippines, actually the points that you can see in the picture in the slide are locations of our weather station. Actually, we analyzed the number of hot days and warm nights and the number of cold days and cool nights. The triangle that you could see… they are saying that the number of hot days and warm nights in the country are increasing, and it is significant. You learn from the presentation earlier of Professor Gerry Bagtasa if it's statistically significant, the signal is strong. You can now join the variability and long-term trends. And in terms of number of cold days and cool nights, so maybe you could, as I have said earlier January to December to February are the coldest months in the year. But maybe you're feeling a little bit warmer because the number of cold days have decreased based on historical records.

So, next please. In terms of sea level rise earlier also Doctor Gerry Bagtasa showed you the east—next please—east of the Philippines that you could see that the level of the sea is rising. And, in fact, based on a study by the United Kingdom Met center, this is a study done not only by the Met Office in UK but also with PAG-ASA—and the findings here is that the global sea level rise is twice in the Philippines. So the global sea level rise in the Philippines is much higher than the global average. So, in fact the global average is four point five (4.5) to five (5) millimeter per year increase from 1993 to 2015. I think the global is from two point eight (2.8) to around three (3), from 1993 to 2010. So, please go back. So based on the study, there are observed sea level rise east of Leyte and Samar, east of Mindanao, south of Zamboanga, along the southwestern coast of Central and Western Visayas. There the data

that, the graph that you you saw on the right side are data from tide gauges. Can you go back again? So those are tide gauges located at Manila Bay, Legazpi, Cebu, Davao, and Jolo, Sulu. You can see that most of the data from all these four (4) gauging station are showing increase, except for Sulu, where the data has been discontinued, no observation.

So next please. So what do we expect to happen in the future? Ah, we might expect sea levels to continue rising in the future and you could see that the global sea level rise is expected to increase by around point eight (.8) meters and you could see that in the Legazpi sea level rise. The global is around one point two (1.2). So the spread, you could see the spread in terms of sea level rise. So, we expect at the 21st Century a one (1) meter sea level rise.

So in terms of changes in precipitation—can you go to the other slide? Is rainfall changing in the Philippines? So parts of Central and Northern Luzon—so the color that you see there, the arrow,the green to blue color indicates that increasing trend and the brown is decreasing trend. So parts of Central Luzon, part of Eastern Visayas, northeastern and southwestern section of Mindanao indicate increasing trend in rainfall. And in northern sections of Luzon parts of Western Visayas, central and western sections of Mindanao, there is a decreasing trend. So if this trend continues in the future, of course there are some impacts, especially, for example in hydropower generation, food security—there is already less water for agriculture, so agriculture will suffer.

So, in terms of extreme weather events, let us see the trends. Next, please. So in terms of observed trends and climate extremes in the Philippines, we look into the extremes in daily rainfall from 1951 to 2010. So in terms of intensity—again, these are the locations of PAG-ASA weather stations. Actually, in terms of intensity, we look at the ninety nine (99) percentile, meaning in the historical record we look at the likes of Ondoy, the highest rainfall recorded for a particular station. And what we found out is, in terms of intensity and frequency, those extreme events are increasing in intensity and number. So the square, the triangle indicates that it's significant, although others are not statistically significant, but the trend is telling you that the current trend now of rainfall extremes are increasing in terms of frequency and intensity.

Next please. During the last ten (10) years, we experienced also the most devastating tropical cyclone in history. Actually, we have Typhoon Haiyan, the most devastating tropical cyclone in our history. And we have Typhoon Ondoy. The farmer mentioned a while ago the one that hit Cabanatuan. So extreme rainfall also. And he mentioned also the one that happened in Real,

Infanta—four (4) tropical cyclones in just a span of three (3) weeks, so many people died in those four (4) typhoons. This is a tropical cyclone that happened in November to December 2004. So you see there, Typhoon Unding, 14, 25 November. So there's another one, 22 to 23, there's Typhoon Violeta. Tropical Depression Winnie and Typhoon Yoyong. So, in a span of just around four (4) weeks, there were four (4) tropical cyclone in a row. So we have Typhoon Frank also that hit the Central Philippines, which caused the sinking of the Princess of the Stars. We have Typhoon Parma that hit the Cordillera in Region I in October 9, 2009. Actually, five (5) days of rainfall, twenty thousand (2,000) millimeters of rainfall. So those are very extreme rainfall.

The normal rainfall, for example, in the month of October, for maybe a certain region here in, for example, Baguio, is only around six hundred (600) and the rainfall that you get for five (5) days is two thousand five hundred (2,500). So you could see a lot of flooding. For example, in Ketsana, the normal rainfall for the whole month of September is only four hundred twenty (420) and, Ketsana, Typhoon Ondoy, is four hundred fifty five (455) millimeter in just one (1) day. So you could see the flooding in the metropolis. And, of course, there's Typhoon Durian, Reming, three hundred twenty (320) kilometers per hour. I think more than four hundred (400) people died. Seven hundred (700) to seven hundred fifty five (755) people died, I think, in that tropical cyclone. And then we have Typhoon Milenyo that hit Metro Manila. Not much rainfall but the wind was very strong that caused some infrastructure also to be destroyed.

Next please. We know that in terms of tropical cyclone, the Philippines is the richest in terms of number. So, we have the most number of tropical cyclone in the world. We have an average of nineteen (19) to twenty (20) tropical cyclones hitting the country. Do you see those blue lines? Those are tracks of tropical cyclone. So you could see that the only place that has relatively few tropical cyclones is Mindanao. But lately, when we look at the trends, there is also increasing trend of tropical cyclone in Mindanao. What happened to Typhoon Bopha in Mindanao in, I think, 2011? Ah, 2012. They didn't know what to do. There were warnings, the warnings were provided but the area has not experienced that kind of strength of tropical cyclones, so the people do not know how to respond. And you could see those are the annual frequency of tropical cyclones in the Philippines from 1948 to 2016.

So, you could see that there's a year to year variability, and that variability of tropical cyclone is mostly due to what we call the El Niño Southern Oscillation. During El Niño, we have few tropical cyclones but the intensity is very strong because during El Niño, the sea surface temperature is very warm and the tropical cyclone gets its energy from the ocean. That's why,

during El Niño, even if we have few tropical cyclone, they are much stronger. And, in fact, during El Niño, we only get like in 2011, we only have around twelve (12) or thirteen (13). During the 1998 El Niño, around twelve (12) or thirteen (13) also tropical cyclones. So we have very few. But we can have as high as thirty three (33). In 1993, there were thirty three (33) tropical cyclones that entered the Philippine Area of Responsibility. Out of this average nineteen (19) to twenty (20) tropical cyclones, nine (9) are making landfall. And even if it's a depression or a tropical storm, it's dangerous when it's landfalling. So, and historically, in terms of number we don't expect the number of tropical cyclone to increase but the intensity [will] increase.

Next please. The graph shows the annual number of tropical cyclones that entered the Philippines Area of Responsibility from 1951 to 2015, and the solid blue line indicates that the annual number of tropical cyclones in the blue dash line shows the linear trend, and the solid dark grey shows the number of T.C.s that made landfall and crossed the Philippine Area of Responsibility. And out of these crossing tropical cyclones, two (2) are destructive. Historically, every year we have two (2) destructive tropical cyclones.

Next please. And in terms of damage, you could see that the tropical cyclone's cost of damage were at record high. So you could see this is increasing and this data are damage caused in millions of dollars.

So next please. What changes are there on tropical cyclones are based on observations. So we graphed the first one, we graphed all the tropical cyclones, and the red one, we graphed the very strong tropical cyclone. And you could see that from 1980 up to 2015, there was a slight increase in terms of tropical cyclone that is greater than one hundred seventy (170) kilometers per hour.

So next please. This is just the same graph. This just shows you the slight increase from 1998 to 2015, the red color, you could see the slight increase in terms of tropical cyclone greater than one hundred seventy (170) kilometers per hour.

So next please. So what are the key findings? For us to know the future, we modeled what will happen in the, in the future through the use of climate models. So these models, this climate projections are not forecast, but these are based on the climate of the greenhouse gas concentration trajectories. Actually, there is this scenario the RCP four point five (4.5) or the Representative Concentration Pathways based on future greenhouse gas emission trajectories, or this is, at least, the business as usual scenario. And

then we have the RCP eight point five (8.5), this is fossil fuel-based, and this is based on a high emission scenario.

So, what do we expect in terms of temperature? The black line indicates the current temperature. And now, at mid-2050, we expect point nine (.9) to one point nine degree centigrade (1.9°C) and at the end of the century, one point three (1.3) to two point five (2.5). And when we look at the high emission scenario, we expect at the mid-2050, one point two (1.2) to two degree centigrade (2°C) and two point five (2.5) to four point one degree centigrade (4.1°C). What scientist are saying is when the temperature reaches above two degrees centigrade (2°C), the changes will already be irreversible. That's why, in the Paris Agreement, they are rooting for one point five degree centigrade (1.5°C). They're asking countries to reduce these greenhouse gas emission so that the temperature will not go up at greater than one- at least one point five (1.5), they said we can still live with one point five (1.5). But with above two degrees centigrade (2°C), the changes will be irreversible already. Especially if there's a one degree (1°) increase in temperature, the climate is very sensitive to a one degree (1°C) increase in temperature. Even at one degree (1°C) increase in temperature, the storm intensity will also increase.

So, next please. In terms of rainfalls, what are our key findings in the future. Actually, that is seasonal - December, January, February, March, April, May, June, July, August, and September, October, November, December. So the driest possible rainfall change is ten (10) percentile of rainfall or could reach up to forty (40) percent reduction in many areas, particularly Mindanao. As I've said earlier, there is the implication, for example, if Mindanao, the source of power is hydropower generation. If you have forty percent (40%) reduction in rainfall, that is a big concern for hydropower. And the wettest possible on the other hand, could exceed forty percent (40%) increase in rainfall, particularly over Luzon and western section of Visayas. This also has implication, for example, in future design of infrastructure. So, if your rainfall, especially in mountainous areas where the rainfall is already very high—for example, in Baguio, our maximum one (1) day rainfall is one thousand (1,000) millimeter a day, just for one (1) day alone—and this could mean if there is an increase in rainfall by about forty percent (40%), so those areas will be wetter than normal.

Next please. And just to summarize in terms of tropical cyclone, in the past sixty five (65) years, there's a slight decrease in the frequency of passage of tropical cyclone through the Philippine Area of Responsibility and a slight increase in the frequency of passage of extreme tropical cyclone with maximium speeds of one hundred fifty (150) kilometers per hour and greater and increasing rate of annual damage caused.

Next please. In terms of the change in tropical cyclone, we did also this study together with the United Kingdom Met-Hadley Center. We simulated five (5) models and in terms of number and we have seen this also and observed, there's no change in the number but in terms of intensity, out of the five (5) models, four (4) models are saying that the tropical cyclone intensity will increase in the future.

So just to summarize, the projected changes to tropical cyclone affecting the Philippines by the mid-21st century, assuming large increases in greenhouse gas concentration, will be the total number of tropical cyclone in the Philippine regions is likely to remain the same or decrease by the mid-21st century. But in terms of intensity, results show some evidence of increase in the intensity of tropical cyclones in the Philippines by the mid-21st century. There will continue to be a high year-to-year variability in the number of intensity of tropical cyclones.

I think that is my last slide and thank you for your attention.

ATTY. PAUDAC:

Your Honors, may we be allowed to ask just one question?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

Ms. Rosalina, earlier you mentioned about the RCP four point five (4.5) and four point eight (4.8), regarding this business as usual scenario. Can you please elaborate on that?

MS. DE GUZMAN:

Actually, there are two trajectory pathways that we're looking. At least RCP four point five (4.5) is more conservative. So there is the introduction of new technologies, there are policies being introduced, there are policies in terms of putting renewable energies, but in the RCP eight point five (8.5), this is without mitigation strategies. We don't reduce and this is still mostly fossil fuel-based. And you could see the increase is very high. If the trajectory eight point five (8.5) will happen because the temperature increase at the end of the 21st century will reach around four degrees centigrade (4°C) in the future.

ATTY. PAUDAC:

Your Honors, may be allowed to have one follow up question?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

With that statement, Ms. Rosalina, would you say that there is connection—you mentioned about the fossil fuel—would you say that there is a connection between the carbon emitted by these fossil fuels to the changes in the daily precipitation and near surface area temperature?

MS. DE GUZMAN:

Actually, as Doctor Bagtasa has also presented in the morning, the carbon dioxide emission is directly proportional to the increase in temperature. But with regards to rainfall, although there is a year-to-year variability, because rainfall is highly variable, it's very difficult to predict. But you could see that according also to Doctor Bagtasa, a one degree (1°) increase in temperature will mean seven percent (7%) increase in the potential evaporation rate. Because of this convective activity, there will be more intense rainfall that could be formed.

ATTY. PAUDAC:

Thank you, Ms. De Guzman. Your Honors, that will be all for the witness, unless you do have questions, Your Honors.

CLERK OF THE INQUIRY:

Your Honor, acknowledging the presence of the Chair of the Commission on Human Rights, Honorable Jose Luis Martin C. Gascon. And also, a preliminary clarification. May we know what RCP means also?

MS. DE GUZMAN:

Okay. RCPs are Representative Concentration Pathways. These are radiation scenarios, meaning if the global greenhouse gases increase, there will be an increase in radiative forcing. Radiative forcing is the positive increase in terms of warming the atmosphere. So if you increase the greenhouse gas concentration, there will be positive radiative forcing. So that radiative forcing, those are the culprit in terms of warming the atmosphere.

PANEL CHAIR CADIZ:

Are there questions from the Panel? Alright, we can proceed to your next witness. Thank you, Ms. De Guzman. But just to notify you: we might recall you at a later date after we have studied your presentation.

Can we now proceed to your fifth witness? Sixth witness?

ATTY. SORIANO:

Good afternoon, Your Honors. We would like to call Ms. Lerissa Libao and Ms. Elma Reyes who will make [a] joint presentation as our sixth witness.

PANEL CHAIR CADIZ:

Please swear in the two (2) witnesses… are both of them going to make an oral presentation?

ATTY. SORIANO:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Give their oral testimonies?

ATTY. SORIANO:

If your will permit that.

PANEL CHAIR CADIZ:

Okay.

CHR LEGAL:

Please raise your right hand. Do you solemnly swear to tell the truth, the whole truth, and nothing but the truth in this National Inquiry under penalties provided by law?

MS. LIBAO:

Yes, Your Honor.

PANEL CHAIR CADIZ:

So who will be presented first?

ATTY. SORIANO:

Ms. Lerissa Libao, Your Honors, is a community leader and a former barangay chief of Villa Jesus-West, Alabat, Quezon.

PANEL CHAIR CADIZ:

Alabat, alright.

ATTY. SORIANO:

She is a vegetable farmer and a coconut sugar maker. Ms. Elma Reyes, on the other hand, is also from Alabat, Quezon. She is a fish vendor and her husband is a fisher and they are from Sitio Adungaw, Barangay Villa Norte, Island of Alabat.

So, we have here, Your Honors, two documents entitled "*Salaysay ni Binibining Lerissa Libao*" and "*Salaysay ni Binibining Elma Reyes*." The *salaysay* of Ms. Lerissa Libao consists of three (3) pages and that of Ms. Elma Reyes consist of five (5) pages. Each document bears the name "Lerissa Libao" and "Elma Reyes" with signatures above the names. May I approach the witnesses, Your Honor, for presentation of these documents?

PANEL CHAIR CADIZ:

These are separate affidavits, no? Separate, not Joint…?

ATTY. SORIANO:

Yes, Your Honors.

PANEL CHAIR CADIZ:

Okay.

ATTY. SORIANO:

I will start with you, Ms. Libao. Do you recognize the document that I just showed you?

MS. LIBAO:

Opo. (Yes.)

ATTY. SORIANO:

And on the last page of the same document, did you see that there is a signature? Do you recognize that signature?

MS. LIBAO:

Opo. (Yes.)

ATTY. SORIANO:

Whose signature is that you've just seen?

MS. LIBAO:

Sa akin po. (Mine.)

ATTY. SORIANO:

Thank you, Ms. Libao. Your Honors, may we offer this "*Salaysay ni Binibining Lerissa Libao*" for marking as Exhibit Z?

PANEL CHAIR CADIZ:

How many pages?

ATTY. SORIANO:

Three (3) pages, so it will be Z series, Your Honors.

PANEL CHAIR CADIZ:

Alright. Atty. Esguerra, please mark the exhibit. Z, Z-1, Z-2, and Z-2-A, the signature on the last page.

ATTY. SORIANO:

As for you, Ms. Elma Reyes, do you recognize the document that I just showed you?

MS. REYES:

Opo. (Yes.)

ATTY. SORIANO:

And do you also recognize the signature above the name 'Elma Reyes'?

MS. REYES:

Opo. (Yes.)

ATTY. SORIANO:

Whose signature is that?

MS. REYES:

Sa akin po.(Mine)

ATTY. SORIANO:

Okay, thank you very much, Ms. Reyes. Again.

PANEL CHAIR CADIZ:

Atty. Zelda, how many pages is that?

ATTY. SORIANO:

This is five (5) pages, Your Honors.

PANEL CHAIR CADIZ:

Okay. So that will be marked as—because we've ran through the alphabet already, we go back to letter A. So that will be Exhibit…

ATTY. SORIANO:

AA, Your Honor.

PANEL CHAIR CADIZ:

AA.

ATTY. SORIANO:

Series, Your Honor.

PANEL CHAIR CADIZ:

Then AA-1 all the way up to the last page. Five (5) pages?

ATTY. SORIANO:

Four (4) pages, Your Honors.

PANEL CHAIR CADIZ:

Four (4) pages. Okay, the last page being AA-3 and the signature therein… be marked as Exhibit AA-3-A.

ATTY. SORIANO:

So, Your Honors, the purpose of the testimony of the two (2) witnesses would be to share the impacts of climate-related events to their family and their livelihood and especially on the vegetable farming that they are engaged with. We will start with Ms. Libao.

PANEL CHAIR CADIZ:

Alright.

ATTY. SORIANO:

And then to be followed by Ms.Reyes.

PANEL CHAIR CADIZ:

Okay, they're just together to sort of support each other, no?

ATTY. SORIANO:

That is correct.

PANEL CHAIR CADIZ:

But they will be finishing their testimonies, in sequence. They will not be given simultaneously… you won't be jumping from one witness to the other?

ATTY. SORIANO:

That's correct, Your Honors.

PANEL CHAIR CADIZ:

Okay, so we start with Ms. Libao.

MS. LIBAO:

Magandang hapon po sa inyong lahat. Ako po ay isang magsasaka na galing sa isang isla, ang isla po ng Alabat sa probinsya ng Quezon. Kami po ay magsasakang naipanganak at hanggang ngayon po ay pagsasaka pa rin po yung aming ikinabubuhay. Ang pagsasaka pong aming kinagisnan ay ang pagkokopra, pagtatanim ng kalamansi, cash crop, at palay.

Unahin po natin ang ating kalamansi. Minsan po nung late 70s ay naging kalamasi basket ang aming isla. Kami po'y nagde-deliver ng maraming kalamansi sa Divisoria at yun po'y nagbigay sa amin ng magandang kabuhayan. Matagal na pong panahon yoon. Kami po'y umalwan ang buhay, ang aming mga kasamahan sa community ay nagkaroon ng mga bahay.

Bigla pong sumapit yung late eighties (80s) to nineties (90s) ay nagkaroon po ng mahabang tag-init na hindi po namin sukat akalain na buhat January hanggang August ay madama namin yung ganun katinding init. Noon ko rin po narinig yung salitang El Niño. Kung inyo pong natatandaan, hindi po namin alam kung ano yung El Niño noon dahil first time po namin na narinig yon. Pero yun po yung nagdulot ng matinding init na syang ikinamatay ng aming mga kalamansi. Nalungkot po kami kasi po mahabang panahon ang aming ginugol sa pagtatanim at pag-aalaga. Then doon po sa punto na yun nasira ang aming kabuhayan. Yun po ay nag-result sa pagbalik doon sa pagkokopra, which is alam naman po ninyo, pag nagkokopra, three (3) months po yung aming hihintayin bago kami makakuha ng mga matured coconut para maging kopra. Iluluto, ibebenta namin sa mga trader. Sa span na iyon ng three (3) months, yun po yung aming ginagamit sa pagtatanim ng cash crop, pag-aalaga ng kalamansi, pagtatanim ng mga palay.

So nakakalungkot po na yung isang malaking hanap-buhay—na sa kalamansi nanggaling yung aming mga pag-unlad—nabawasan po nang dahil sa matinding init. Lumipas po yung mga taon, kami po ay patuloy pa rin bilang magsasaka, saka yun naman po talaga ang aming ikinabubuhay. Sa cash crop naman po, kami po ay nagtatanim ng mga gulay, naranasan po namin ang matinding init na wala na po kaming makuhang mga tao na maggagamas. Alam po ninyo yung paggagamas, yung pagwi-weeding? Yung ipe-prepare

yung ating taniman, aararuhin, then lalagyan po natin ng mga punla upang maging isang taniman.

Ang naging problema po namin noon, wala kaming makuhang mga tao na magtatrabaho ng arawan. Kasi po sila ay tatangging arawan ng one fifty (150) o two hundred (200) ang bayad. Hindi po sila naman makapagtrabaho ng dire-diretso dahil pag dating po ng nine o'clock o ten o'clock, sila po ay nagrereklamo na sa sobrang init.

Bilang magsasaka, ginawan po namin ng paraan. Ang nangyari po, dagdag na naman pong bayad, per oras po yung aming ginagawa. Hindi na po kami nagdedepende doon sa one day na bayad, per oras na po yung nagiging usapan namin na pagbabayad sa mga nagtatrabaho . Hindi na po nag-aano doon sa Labor Code natin na isang araw kung isang araw, ano po. Oras na po yung pinag-uusapan ng mga magsasaka. From six to nine, then from three to five, so umuunti po yung oras na ipinagtatrabaho naming

So patuloy pa rin po kaming nagtanim ng kalamansi at nakita po namin na kahit papaano, kung namatay yung iba naming tanim, ay may pumapalit naman po. Kaya lang po talagang hindi natin maiwasan na yung kalamansi, pagdating ng taghangin, tag-ulan, ito po nagkakaroon ng mga scab. Nagiging resistant na po yung peste, tapos po hindi na rin po sya makatas kasi po may mga ring borer na talagang sumisira. So nagiging resistant po yung mga peste dun sa ating panahon. Yung matinding init, kaya na nila pong matiis at nabubuhay po sila talaga.

So kahit pa po ganun kami bilang magsasaka, patuloy pa rin po na nagsasagawa ng ibang paraan para mabuhay dahil yun lang naman po talaga ang aming hanap-buhay.. Sa pagniniyog naman po, three (3) months ka maghihintay ng kopra. Mayroon pong technology ang pamahalaan na ibinigay sa amin yung pag-coco sugar. Doon po sa technology, sabi nila six (6) hours kailangan makuha yung tuba bago maasukal. At sinusunod po naman namin yun, pero hindi pa rin po. Yung pong six (6) hours, kanakailangan naming gawing four (4) dahil sa sobrang init. Pag po na-ferment ang isang tuba, hindi na po sya nabubuong asukal. Hindi na po sya nagiging granules na ganito [Resource person holds up a sample of coco sugar]. Sya po ay balikutsay. Yun po ang ibig sabihin namin, hindi sya masisilid sa mga plastik, hindi namin mabebenta.

Lagi na pong may balakid doon sa pag-unlad ng isang magsasaka dahil po sa pagbabagong iyan ng mga panahon. Sabi nga po namin, ano ba yang climate change na yan, 'di naman namin yan alam, sa totoo lang. Ito na lang pong mga nakalipas na araw, nakikita namin kung papaano ang laki pala ng

epekto. Ngayon nga lang po, doon sa presentation na isinagawa ng ating mga resource persons, doon ko po nakita na nagkakatagni-tagni po ba ang taon na kami'y dinaanan ng tag-tuyot, taon na dinaanan kami ng mga malalakas na baha, meron pong koneksyon. Nakita ko po na sana po ay mabigyan naman ng pamahalaan na mapag-aralan, ano pa ang mga pwede naming magawa para kami ay maka-adapt.

And, sabi ko nga po doon sa mga young generation, sana makita ninyo yung kahalagahan ng isang magsasaka. Kasi po kung wala nang magpo-produce ng pagkain, kung sila po ay mawawalan ng loob sa pagsasaka, paano naman po kaya yung ating sambayanang Pilipino na umaasa dun sa ating mga pino-produce.

Yun lang naman po at sana ay mapagtagumpayan po natin ang ating mga hangarin na magkaroon ng pananagutan ang mga may kasalanan doon sa ating nadadanas na kahirapan. At sana po ang mga magsasaka naman ay patuloy na sumama sa mga ganitong gawain dahil kung hindi po tayo magsisimula ngayon ay sino po ang gagawa? At kung hindi po ngayon ay kailan pa?.

So yun lamang po at marami pong salamat sa inyong lahat.

ENGLISH TRANSLATION OF MS. LIBAO'S TESTIMONY (TRANSLATION DONE AFTER HEARING)

Good afternoon to everyone. I am Luisa Libao, a farmer from Alabat, Quezon Province. I was born a farmer and remained as such to this day. The farming that we have known is growing coconuts, calamansi, cash crops, and palay.

Let's start with calamansi. In the late '70s, our island became the calamansi basket of the country. We used to deliver a lot of calamansi in Divisoria and it gave us a good livelihood. We lived well, some in our community were able to build their own houses. Then in the '80s and '90s, we experienced a long dry spell. We couldn't believe we would feel such heat from January to August. That was when I first heard of the term El Niño; we had no idea what it was then. That dry spell destroyed our calamansi. We labored long to grow our calamansi but, suddenly, our livelihood was destroyed. We went back to harvesting coconuts for copras. But it takes three months to wait for coconuts to mature before you can turn them into copra, so we used those three months to plant cash crops, calamansi, and palay. It's sad that a big part of our livelihood was taken by extreme heat.

The years passed but we continued farming, since that is really how we made our living. As for cash crops, we planted vegetables, but even these suffered from extreme heat. We couldn't hire people who would weed and prepare the land for planting. We couldn't find people who would work for a daily wage of P150 to P200 because they couldn't work a full day anyway because by 9 a.m or 10 a.m., it would already be very hot. So, what we did was to pay them an hourly rate, never mind the Labor Code. We had to pay extra. We worked from 6 a.m. to 9 a.m. and then from 3 p.m. to 5 p.m. We had to work less hours.

Yet we still continued planting calamansi. Even though some die, others would replace them. But we can't avoid the calamansi getting scabs especially during the rainy season because the pests would ruin them. These pests have learned to survive even in extreme heat. But we still persevered. In terms of farming coconuts, we wait for three months for them to be ready for copra. The government taught us a technology to make coco sugar. They said we should be able to get the cocojuice (tuba) in six hours to produce sugar. We followed it, but it's hard. We had to do it in four hours because of the heat. When tuba is fermented, it can no longer be turned into sugar. It cannot be transformed into granules. We cannot put it inside a plastic bag; so we cannot sell them.

There are hindrances the way of a farmer's success because of climate change. We often say, what is climate change? We don't know what it is, to be honest. It was only these past few days, listening to the presentations made here, that I began to make a connection with the natural calamities that we experienced.

I hope the government can study what can be done so that we, farmers, can adapt. I often tell the young generation, I hope you realize how important farmers are. If no one produced food, if farmers lost the will to farm, what will happen to this country who depend on what we produce? That is all, and I hope we succeed in our goal to make those responsible accountable. I hope farmers continue to participate in these activities because if we don't start now, who will? If not now, then when? That is all and thank you very much.

PANEL CHAIR CADIZ:

Do you have questions for your witnesses, Atty. Soriano?

ATTY. SORIANO:

May we reserve, Your Honors, the questions after Ms. Elma Reyes?

PANEL CHAIR CADIZ:

Alright. So, we proceed to the next witness.

ATTY. SORIANO:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Okay.

MS. REYES:

Ako po si Elma Reyes from isla rin po ng Alabat. Kami po ay sa Pacific side *ng Alabat. [Sa]* Pacific side *na po kami nakaharap.*

Ang magulang ko po ay isang mangingisda. Ang napangasawa ko po ay isa pa rin pong mangingisda. Noong panahon po ng tatay ko, tatay ko pa ang nangingisda, magagandang klase pa po ng isda ang nahuhuli, malalaki, at saka konting oras pa lang po sa dagat, meron nang isda.

Sa panahon po ng mister ko ngayon, napakatagal na po nya sa dagat, pero konti na lang pong isda ang nahuhuli nya. Siguro po ay sa tindi ng init ng panahon at saka po, syempre po, Pacific side *na po kami. Tulad nga po nung minsan, nagtanong sakin yung anak ko, sabi "Mama, bakit ganun,* Holy Week *na, bakit ang sama pa ng panahon? Dati naman hindi ganyan ang nangyayari," Sabi ko'y, "Oo nga, anak, yan ang napapag-aralan namin sa* seminar. *" Sabi ko'y "'yan yata yung sinasabing* climate change, *" gawa nang hindi naman dating nangyayari ang ganun. Pag* Holy Week, *talagang alam naming talagang pantay na pantay ang dagat pero ngayon po talaga,* one (1)

week *na po, hindi nakakalaot ang mister ko. Napakalaki po ng epekto sa amin ng ganun dahil nasisira yung* budget. *Minsan,* allowance *na ng anak ko, isang linggo, magagastos na namin. Walang pangpalit. Saan kami kukuha ng pampalit?*

Ay, vendor *din po ako ng gulay. Dati po, ang ganda rin ng* source *ko, nakakatulong din po ako sa mister ko dahil nakakabenta rin ako dahil magaganda pa ang gulay noon. Di pa matindi yung init na nakakasira ng halaman. Ngayon po, hindi na rin po ako makakuha ng mga gulay na pambenta ko dahil sino naman pong bibili, ang sasama na ng gulay na natubo gawa ng init ng panahon. So sira din po, wala na. Hirap na hirap na kami.*

Kaya po yung isang araw na inilalagi ko, bali three (3) days *po kami dito, napakalaking kawalan na yun sa akin.* Three (3) days *na kong naglalagi dito pero sinasakripisyo ko po yun para kahit papaano ba ay makita nila na ako, mahirap lang ako, nagtitiis ako para marinig nila yung nangyayari sa panahon natin ngayon ay napakalaking kawalan sa aming mahirap. Sila, hindi nila nararanasan dahil mayayaman sila, kaya wala silang pakialam. Papano kami? Papano yung mga anak namin? Yun lamang po.*

ENGLISH TRANSLATION OF MS. REYES' TESTIMONY (TRANSLATION DONE AFTER HEARING)

I am Elma Reyes, also from the island of Alabat. We live on the Pacific side. My parents are fisherfolks. My husband is a fisherman. I remember during my father's time, his catch was very bountiful, good species of fish could be caught, they were all big. And you didn't have to be out at sea for long. Now, in my husband's time, he stays out at sea for long stretches of time, but the catch is not as good. Maybe it's because of the extreme heat. And we live in the Pacific side, it's different.

My childr once asked me, "Mama, it's already Holy Week, why is the weather still bad? It wasn't like this before." I said, "Yes, child, this is what I have been taught at the seminar. This is what they called climate change." We know that every Holy Week the sea would be very still. Now it's different. It's been a week now that my husband could not go out to the sea. It has a huge effect on me. It ruins our budget. Sometimes we have no choice but to use our child's allowance, and we have no way of replacing it. Where do we get the money?

I also sell vegetables. I used to get the good kind, because the quality of vegetables was very good then. Now, I cannot find good vegetables to sell.

Where do I buy? Most vegetables I find are of poor quality because of the hot climate. We are so hard up. The three days I have spent here are days that I don't work. It's a huge loss. But I make the sacrifice because I want the people to know our condition. Maybe they don't experience it because they're rich, but what about us? How about our children? That is all.

ATTY. SORIANO:

Thank you, Ms. Libao and Ms. Reyes. Your Honors, I only have, like, two (2) questions if you will allow me.

PANEL CHAIR CADIZ:

Please proceed.

ATTY. SORIANO:

So the first question would be for Ms. Reyes. Is it okay, Ms. Reyes, to ask the questions in English? And you can answer in your comfortable language. Can you indicate the years when you said that your father was fishing and catching fish abundantly? Can you just give a general indication of time? When was that?

MS. REYES:

Father ko po mga 1980s. (My father fished in the 1980s.)

ATTY. SORIANO:

So in the 1990s-

MS. REYES:

Mister ko na po yun. Nag-uumpisa na po nun ang trahedya ng panghuhuli ng hindi maganda. (That would be my husband's time. That was also when the tragedy of bad fishing began.)

ATTY. SORIANO:

So you experienced poor fish catch beginning in the 1990s? How about your father's experience? What were the years?

MS. REYES:

Nineteen eighties (1980s) *po yung father ko maganda pa yung panghuhuli. Pero nung 1990s po, yung mister ko na po yung nangingisda,. Mahina na po noon ang panghuhuli, until now, lalo pong pahina nang pahina ngayon.*

(In the 1980s, my father used to have a good catch. But in the 1990s, when it was my husband's time, the catch became smaller and smaller.)

ATTY. SORIANO:

Okay, thank you very much for that. My next question is you mentioned that you cannot also sell quality vegetables. Can you describe the not good quality of the vegetables that you are harvesting and selling these days?

MS. REYES:

Tulad po ng binebenta ko, pechay at saka po sitaw. Yung sitaw po mga payat na minsan wala nang buto, mataba dati. Ngayon po, merong ganun na yung space *bago magbuto tapos* space *na naman tapos payat.* So *sa pechay naman po, kulubot na yung dahon nya, hindi na sya malapad, na hindi na mayabong. Hindi na maraming petals yung kanyang ano.*

(I sold snow cabbage and string beans. String beans are now very thin, the seeds are too far apart. The snow cabbage is no longer leafy and the leaves are narrow.)

ATTY. SORIANO:

Just one last question for Ms. Nerissa Libao, Your Honors. Ms. Libao, you mentioned that there is a bad effect to your family these climate-related events. So, can you just describe what happened to your family after the drying of your kalamansi farm?

MS. LIBAO:

Medyo po hindi nakapag-aral ang aking mga anak and humingi po ako ng tulong sa aking mga kapatid ng sila ay mapa-aral. And *ang epekto po noon ay wala po akong anak na gustong sumunod sa aking yapak. Gusto po nila ay magtrabaho sa ibang lugar, ibang kurso yung kunin. Nalulungkot ako dahil mahal ko yung pagsasaka.*

Kahit po ngayon, kahit inaakit ko sila ay naisip ko po, sino yung pagbibigyan ko ng aking coco sugar, *yung aking maiiwanang. Wala pong nag-iisip sa aking mga anak. Yun po yung isang problema na hindi ko masabi sa mga anak ko na "Pagsasaka naman ang bumuhay sa inyo. Natulungan lang kayo ng mga ate ninyo." At lagi po yun tinatanong sa amin, "Sino ang magmamana ng inyong kalamansian? Sinong magmamana ng inyong* coco sugar*?" Matanda na po kami. Nakakalungkot po na wala ng batang magsasaka.*

(My children could not go to school. I had to ask my siblings for help to enroll them in school. But the real effect is that my children do not want to follow in my footsteps as a farmer. They want to work in other places, enroll in a different college course. I am sad because I love farming. I encourage them to farm, but to no avail. Where will I leave my legacy and livelihood to? My children do not give it a thought. I cannot tell my children that they survived because of farming. I often get asked who will inherit my calamansi, my coco sugar? We are getting old. It's sad that there are no young farmers anymore.)

ATTY. SORIANO:

Thank you very much, Ms. Libao, Ms. Reyes. That is all, Your Honors.

PANEL CHAIR CADIZ:

Thank you, Ms. Libao and Ms. Reyes, and thank you, Counsels. Will there be questions from the Panel? We will not be asking questions today but we might need to recall the witnesses at a later date. In the meantime, we can proceed to your last witness.

Alright. Thank you.

ATTY. MAYO-ANDA:

Good afternoon again, Your Honors.

PANEL CHAIR CADIZ:

Thank you, witnesses.

ATTY. MAYO-ANDA:

We are pleased to have with us today, Your Honors, a representative from the Climate Change Commission in the person of Atty. Efren Marcelino Bascos, who is the Chief of Legal Services of the Climate Change Commission. But we have been apprised by Attorney Bascos that he can only make a manifestation today and a written statement cannot be submitted yet. So may we call on him, Your Honors?

PANEL CHAIR CADIZ:

Alright.

ATTY. MAYO-ANDA:

To make the manifestation.

PANEL CHAIR CADIZ:

You prefer to make your manifestation there? That's alright also, if you prefer to do it there since you won't be testifying.

ATTY. BASCOS:

Yes, Your Honors, since I will not be testifying, I'd rather make the manifestation on the counsel's chair, Your Honor. I am Atty. Efren Bascos, the Chief Legal Counsel of the Climate Change Commission. We regret to inform the Commission on Human Rights that the Climate Change Commission cannot, as of now, submit the position paper, a written manifestation on this matter, considering that any paper's position that has to come out from the Commission must have the imprimatur of the Commission itself and the Commission will be convening on April 20th for the regular commission session. So, we beg the pardon of this Commission for us not to be able to deliver the message today, Your Honors.

PANEL CHAIR CADIZ:

Attorneys for petitioners, do we understand that you'll be presenting this resource person in May during the second series of hearings?

ATTY. MAYO-ANDA:

Yes, Your Honor, we are hopeful that after the meeting in April, then a written statement or position can be secured from the Climate Change Commission.

ATTY. BASCOS:

Yes, Your Honor, whether I will be presenting the position of the Commission or one of the commissioners will be presenting the position of the Commission, it will still have to be decided by April 20.

PANEL CHAIR CADIZ:

Okay, we will respect that.

Chair, you have questions?

CHAIR GASCON:

Just to clarify, Your Honor, you said that there will be a meeting of the Commission on the 20th of April. Is this matter about the public Inquiry on human rights and climate change something that the Commission, your commission, is already apprised of? And is this a matter that's on the agenda for April 20?

ATTY. BASCOS:

It is a regular Commission meeting, Your Honor. And as the head of the secretariat of the Commission itself, I have already tabled this as part of the agenda of the Commission.

CHAIR GASCON:

Is there anything you will be needing from the Commission on Human Rights like a communication or a request for, like a subpoena *duces tecum* or any other matter that you think will be necessary from us to facilitate a position paper that will eventually come out from the Commission? Or is your presence here sufficient for that purpose?

ATTY. BASCOS:

Your Honor, what I have tabled is the request coming from Greenpeace, because they're the ones who made communication with us. However, we would appreciate if we can receive something from the Commission itself so that it would be an official communication of the Commission on Human Rights.

CHAIR GASCON:

Then that is something we shall do.

PANEL CHAIR CADIZ:

We will not send you a subpoena, we will send you an invitation.

ATTY. BASCOS:

Thank you, Your Honor. That would be better, Your Honor.

CHAIR GASCON:

Maybe an invitation but also explaining the nature of the Inquiry and the status, as well as perhaps a copy of the petitions, at least, the initial petitions, so that you are fully apprised. If you will be meeting in April, do you think that there is sufficient time for the Climate Change Commission to be able to give us substantive interventions and positions for the hearing in May?

ATTY. BASCOS:

For the positions, yes, Your Honor. For interventions, I cannot answer that at this time. And if Your Honors please, I heard the opening statement of the Chair this morning, and maybe a written copy of that opening statement of the Chair might be helpful with the Commission.

PANEL CHAIR CADIZ:

Okay, we will provide your commission with a transcript of stenographic notes of today's hearings, as well as the other parties. Announcement in that regard will be made by the clerk of court later on before we end the hearing.

ATTY. BASCOS:

Thank you very much, Your Honors.

CHAIR GASCON:

Thank you.

PANEL CHAIR CADIZ:

Are there other matters which the counsels might wish to manifest before the Panel?

Thank you very much, Ms. De Guzman.

(To Atty. Soriano) *Pañera*?

ATTY. SORIANO:

Your Honors, we would just like to manifest that the witnesses and resource persons that we are supposed to present today, I think they were all presented and so we are looking forward to the next hearing day.

PANEL CHAIR CADIZ:

Which is tomorrow.

ATTY. SORIANO:

When we will present our resource persons and witnesses. Six (6) witnesses and resource persons.

PANEL CHAIR CADIZ:

Six (6) witnesses… Just a quick reminder. Tomorrow we end at one o'clock or 1:30. Okay, we have a half-day hearing tomorrow and I suppose that would be sufficient for your six (6) witnesses. Am I correct?

ATTY. SORIANO:

Yes, Your Honors. The first witness actually is a joint presentation by three (3) scientists but they have already agreed that one (1) will make the presentation and the two (2) others will help answer questions, if needed.

PANEL CHAIR CADIZ:

Alright, and their expertise are different?

ATTY. SORIANO:

Under a general classification of issue, but they have sub-classification of issues where they have their own respective expertise.

CHAIR GASCON:

So you have six (6) witnesses but three (3) of those will be in one (1) presentation? So, one (1) by three (3)? So, we're talking about four (4) presentations?

ATTY. SORIANO:

That is correct, Your Honor.

CHAIR GASCON:

You said, Mr. Presiding Officer, that we will be until 1:30 so I presume that means there will be a late lunch for us since we have to…

PANEL CHAIR CADIZ:

Yeah, the lunch break will come after 1:30.

CHAIR GASCON:

Okay. I hope there will be a morning break for a long snack nonetheless. Listening to six (6) presentations in one (1) morning might be a human rights violation. I'm just kidding. After all, there is a right to food, no.

PANEL CHAIR CADIZ:

And I was about to say this is the very first time we will be experiencing hearing three (3) persons in one (1) witness presentation… the trinity. Are there other…

CHAIR GASCON:

By the way, just so you know, tomorrow the Commission will be here but two (2) of the five (5) commissioners are celebrating their birthdays. They are actually entitled to a birthday leave but because of the importance of this matter, they have decided to suspend their right to a birthday leave to listen to the six (6) presentations, including the one (1) in three (3). So, let us just hope that it isn't going to be cruel and inhuman treatment. I'm just kidding.

PANEL CHAIR CADIZ:

So are there other matters?

Counsels?

ATTY. SORIANO:

Nothing further, Your Honors.

PANEL CHAIR CADIZ:

So, I would like to address the body. Is there anybody within this hall who would want to manifest anything before this Commission? Counsel, clerk of court, please.

CLERK OF THE INQUIRY:

Your Honor, the transcript of stenographic notes for the 11 December 2017 meeting shall be made available upon written request to the Commission through a letter or email to nicc.chrp@gmail.com.

Also, Sir, the availability of the TSN for this particular Inquiry hearing shall be announced in the notice from the Commission.That is all, Your Honor.

PANEL CHAIR CADIZ:

As of yesterday, we have been informed that we will have to give the transcripts to the parties for free because there are certain issues… if we charge the parties for the transcript. So, anyway, before we… adjourn, just… last reminders: it was pointed out to me earlier by the clerk that some of the exhibits that were marked are photocopies, so at a latter time, probably before May, maybe you can present us with originals, especially the PowerPoint presentations that we noticed were in color. But in the photocopies, they were in black and white, so it's difficult to appreciate (them). So that is one (reminder).

We are reminding you that we need the English translations of the exhibits in Filipino that were marked earlier. But they will be marked separately. We

hope that that could also be made before the next hearing in May. Alright, any more, Chair?

CHAIR GASCON:

May we know what time we begin tomorrow since there will be six (6) presentations?

PANEL CHAIR CADIZ:

We will start at 9:30?

CHAIR GASCON:

Nine (9)?

PANEL CHAIR CADIZ:

9:00 am. Alright.

CHAIR GASCON:

So, we will resume the session at nine (9) tomorrow?

PANEL CHAIR CADIZ:

9:00 am up to 1:30. So if there are no other matters to be discussed, the hearing is adjourned.

Thank you very much, everybody.

[Bangs gavel]

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ATTY. TRISHA ISABELLE F. FERNANDEZ (CLERK OF THE PANEL):

Good morning. This public hearing is being held as part of the national inquiry being conducted by the Commission on the Impact of Climate Change on the Human Rights of the Filipino People and the Responsibility therefor, if any, of the "Carbon Majors." This proceeding stems from a petition filed before the Commission, docketed as CHR Case No. CHR-NI-2016-0001.

The solemnity of the public hearings shall be upheld at all times. Respect should be accorded to everyone present. The clapping of hands, booing, and unnecessary remarks shall not be allowed and may be regarded as direct contempt of the Inquiry Panel. Cellphones should be turned off or put on silent mode while proceedings are going on.

All rise. Commissioner-Honorable Commissioner Leah C. Tanodra-Armamento; Honorable Commissioner Gwendolyn Ll. Pimentel-Gana; Inquiry Panel Chairman of the NICC, Honorable Commissioner Roberto Eugenio T. Cadiz; Honorable Commissioner Karen S. Gomez-Dumpit; and the Chair of the Commission on Human Rights, Honorable Jose Luis Martin C. Gascon.

Please remain standing for the national anthem.

[National anthem]

Everyone may now be seated.

PANEL CHAIR CADIZ:

[Bangs gavel]

We shall now start our session for this morning. May we have the appearance of counsels?

COUNSEL FOR PETITIONERS, ATTY. SORIANO:

Good morning, Your Honors. Same appearance for the Petitioners.

COUNSEL FOR PETITIONERS, ATTY. MAYO-ANDA:

Same appearance for the Petitioners.

COUNSEL FOR PETITIONERS, ATTY. PAUDAC:

Good morning, Your Honors. Same appearance for the Petitioners.

PANEL CHAIR CADIZ:

Alright, just for the record, can you mention quickly the names of the three (3) counsels?

ATTY. SORIANO:

Zelda Soriano, Your Honors, for the Petitioners.

ATTY. MAYO-ANDA:

Grizelda Mayo-Anda, Your Honors, for the Petitioners.

ATTY. PAUDAC:

Hasminah Paudac, Your Honors, for the Petitioners.

PANEL CHAIR CADIZ:

You may now proceed to present your first witness for the day.

ATTY. SORIANO:

Before the presentation of our first witness for today, Your Honors, may we just manifest that we have one (1) of our witnesses who requested that some parts of his presentation, and, also, during the additional questioning portion, be done in our native language, that is Filipino.

And based on our experience yesterday, some of our Filipino expert resource persons have also spoken a few Filipino words in the middle of an English presentation. So, having said that, may we now manifest that, when they speak in Filipino today, the official translation will be submitted in the next reasonable date that you will indicate instead of doing the simultaneous or summary translation immediately after the speaking and the presentation.

PANEL CHAIR CADIZ:

Alright, so your motion is granted in order to facilitate the offer of testimony of the witnesses. Okay, granted. Can we now have your first witness?

ATTY. PAUDAC:

Good morning, Your Honors. Your Honors, please, may we call on our eighth resource person? Actually, it is a panel composed of three (3) marine scientists: Doctor Laura T. David, Doctor Maria Lourdes San Diego-McGlone, and Doctor Porfirio Miel Aliño.

PANEL CHAIR CADIZ:

May we request our legal officers to swear-in the three witnesses?

CHR LEGAL OFFICER:

(Gives oath to witness)

ATTY. PAUDAC:

Your Honors, Doctor Laura T. David earned her Bachelor of Science in Chemistry in the University of the Philippines-Diliman and Doctor of Philosophy Physical Oceanography in the University of South Carolina, USA. Doctor David is currently a professor at the University of the Philippines-Diliman Marine Science Institute and she holds, among others, these various positions: Associate Dean for Facilities and Resource Management, College of Science, University of the Philippines; he's also a member of the Technical Panel for Science and Mathematics of the Commission on Higher Education; and Chair, Technical Committee for Marine Science of the same commission. Doctor David has published several research studies and also books and has several patents, copyrights, and trademarks.

Our second resource person is Doctor Maria Lourdes San Diego-McGlone. She earned both Bachelor of Science in Chemistry and Master of Science in Oceanography at the University of the Philippines-Diliman and Doctor of Philosophy in Chemical Oceanography at Old Dominion University, Virginia, USA, wherein she was named as the 'Outstanding Ph.D. Graduating Student in Oceanography.' She's currently a professor at the University of the Philippines' Marine Science Institute and has held several positions as Marine Chemistry Expert or consultant for water quality-based science studies. She has also several publications written in her curriculum vitae.

And, finally, to complete the panel is Doctor Porfirio Miel Aliño, who has earned his Bachelor of Science in Marine Biology and Master of Science in Marine Biology both at the University of the Philippines-Diliman and Doctor of Philosophy in Marine Chemical Ecology at James Cook University, Queensland Townsville, Australia. Doctor Aliño was awarded before as Ten Outstanding Young Scientist and also the 2013 Chancellor's Outstanding Alumnus at James Cook University, among other awards. Doctor Aliño has also published several researches and studies.

Your Honors, we're calling these witnesses to explain ocean acidification, its cause and effect, and the vulnerability of the Philippines to the impacts of ocean acidification. For this presentation, Your Honors, Doctor David will

make her presentation on behalf of the panel and thereafter, the panel will entertain questions from the commission and the lawyers.

PANEL CHAIR CADIZ:

Before you do that, Counsels, are you going to mark the statement?

ATTY. PAUDAC:

Yes, Your Honors. Thank you for that, Your Honor. Your Honors, we have here documents. May we be allowed to ask preliminary questions? Doctors McGlone, David, and Aliño, we have here a joint statement of Maria Lourdes San Diego-McGlone, Ph.D. in Chemical Oceanography; Laura David, Ph.D. in Physical Oceanography; and Porfirio Aliño, Ph.D. in Marine Chemical Ecology consisting of four (4) pages. Kindly please go over it and please do tell me if you do recognize the document.

DR. DAVID:

Yes, I do.

DR. MCGLONE:

Yes, I do.

DR. ALIÑO:

Yes, I do.

PANEL CHAIR CADIZ:

Counsel, this document you just identified… our copies, at least, are not signed.

ATTY. PAUDAC:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Is your copy signed?

ATTY. PAUDAC:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Already?

ATTY. PAUDAC:

The copy that we actually manifested, Your Honor, they will be signed during the hearing because we had some difficulty in gathering the signatures.

PANEL CHAIR CADIZ:

So, have they been signed already?

ATTY. PAUDAC:

Yes, Your Honor. They were signed just today, Your Honor.

PANEL CHAIR CADIZ:

Okay, so we can have them marked already.

ATTY. PAUDAC:

Yes, Your Honor. May we request that this joint statement of Drs. McGlone, David, and Aliño be marked as our Exhibit BB consisting of four (4) pages? But before that, Your Honor, we would like to ask again their confirmation of the signatures. Do you confirm the signatures?

DR. DAVID:

Confirming my signature.

ATTY. PAUDAC:

Everyone, Your Honors, confirmed their signatures.

PANEL CHAIR CADIZ:

Attorney Esguerra, please mark the exhibit: the first page as BB, second page BB-1, then BB-2, BB-3. And then the signatures appearing on page three (3), be marked as Exhibit BB-2-A, and then the two (2) signatures appearing on the last page as BB-3-A and BB-3-B. Counsel, you may now proceed to examine your witness.

ATTY. PAUDAC:

Your Honors, there are other documents.

PANEL CHAIR CADIZ:

Alright.

ATTY. PAUDAC:

By the way, Your Honor, Drs. McGlone, David, and Aliño, do you confirm and affirm the statements mentioned in the joint statement? All witnesses confirm and affirm the joint statement.

In your joint statement, you attached your curriculum vitaes. May I give you these documents and please tell me if your do recognize these documents and if you do confirm and affirm the contents of said documents?

DR. DAVID:

I'm confirming the contents of the document.

DR. MCGLONE:

Me as well.

DR. ALIÑO:

I confirm.

ATTY. PAUDAC:

Your Honors, the resource persons confirm the curriculum vitaes attached to their joint statement. May we request that these be marked separately: For the curriculum vitae of Doctor Laura David as Exhibit CC series; for the curriculum vitae of Doctor Maria Lourdes San Diego-McGlone as Exhibit DD series; for the curriculum vitae of Doctor Porfirio Miel Aliño as Exhibit EE series.

I have also here another document, a PowerPoint presentation entitled "How Increased Carbon Dioxide Affects the Oceans," Marine Science Institute, College of Science, University of the Philippines. Please kindly go over this document and tell me if you do recognize this document.

DR. DAVID:

Yes, I do.

DR. MCGLONE:

Yes, I do.

DR. ALIÑO:

Yes, I do.

ATTY. PAUDAC:

Your Honors, the witnesses confirm the contents of their PowerPoint presentation, which they actually submitted this morning. Finally, Your Honors…

PANEL CHAIR CADIZ:

Wait, are you going to have them marked also?

ATTY. PAUDAC:

Yes, Your Honors. May we request that this be marked as our Exhibit FF, Your Honor, consisting of eight (8) pages. Finally, there appears a document

which is an infographics containing sea level rise and ocean acidification. Please kindly go over it.

DR. DAVID:

Yes, I recognize the document.

ATTY. PAUDAC:

Do you confirm and affirm the contents of this document?

DR. DAVID:

I do.

ATTY. PAUDAC:

Your Honors, may we request that this document, an infographics on sea level rise and ocean acidification, be marked as our Exhibit GG?

PANEL CHAIR CADIZ:

Are all these documents, the ones that you will be presenting now? These are all the documents? There are no other documents?

DR. DAVID:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Alright. These documents are co-authored by the three (3) of you, including the PowerPoint presentation, the last one?

DR. DAVID:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Okay, so you can now proceed to examine your witness.

ATTY. PAUDAC:

Doctor David will be starting her presentation.

PANEL CHAIR CADIZ:

Okay.

DR. DAVID:

So, I would like to direct your attention to the screen. And you'll see a short presentation on how increased carbon dioxide affects the ocean.

Next slide please. So what we see here is the normal, natural production of carbon dioxide. Carbon dioxide is not an alien element in the world. We naturally produce it from plants, from planktons in the ocean, and also as part of the natural hydro-cycle. But what you will see is, in most of the cases—for example, over the forest—when we produce sixty gigatons (60 Gt), we also consume sixty-one point three (61.3). There's a natural cycle of production and reintroduction into the environment. But there is one component where

we're producing six gigatons (6 Gt)— if you compare the amount, it seems small. But in this case, there's no natural uptake of that generated carbon dioxide (CO_2), and that carbon dioxide (CO_2) is generated mostly by fossil fuel and cement.

Next slide please. And if you take a look at this production, a majority of that, forty-five percent (45%), is actually produced by coal, thirty-four percent (34%) is produced by oil consumption, eighteen percent (18%) by gas, and five percent (5%) by cement. And that production has been increasing through the years, in this graph shown from 1990 to 2010.

Next slide please. Now, the problem with the production of carbon dioxide (CO_2) is it produces what is called a greenhouse effect. The earth naturally has the greenhouse effect because if we don't have the natural layer of all these gases, we would end up being a very, very cold planet. So, there is this natural layer, but the problem now is the layer has thickened such that what would naturally be outgoing heat from the Earth is now trapped within this layer. Imagine yourself inside a house or a garage. If you keep all the heat inside, if the heat cannot go out, cannot exhaust out, you'll end up having a higher temperature inside. That's why it's called the greenhouse effect.

Next slide please. This increase in temperature, has direct effect on our food security. Shown in this graph is predicted change in available potential catch. The red means there's a huge reduction of up to thirty one (31) to fifty percent (50%) in available fish catch due to temperature change alone.

If you take a look at the map, the Philippines is actually located on the left-middle side right next to the Pacific. And you see there is already a predicted great reduction of fifty percent (50%) of available fish catch by year 2050. Aside from this, locally, we also have fish that is only used to certain degrees of temperature. So it's very much like somebody that's used to living in Baguio and then you go down to Manila. There's this temperature difference. But in the case of fish, it affects their function dramatically, such that they would rather go to somewhere colder if this happens. So that means they either go in higher latitude or they go deeper. Either reaction would result to less accessibility to our fishermen. Aside from this, those that cannot migrate— because there are certain fish who live only in certain areas like mangroves, sea grass, corals—the end result would be recruitment failure. Meaning the next generation, when they give birth, can no longer survive in that area. So the adults would remain for a while, but the next generation would disappear.

Next slide please. Aside from temperature, this increase in carbon dioxide actually has multiplier effect in the ocean. An increase in temperature would

result in bigger storms because storms only get their energy from heated ocean. So, if the ocean is about twenty-eight degrees (28°), then that's the start of a storm. An increase in temperature would actually result in bigger storm. Aside from that, because of the bigger storm, you'll end up having bigger waves, storm surges, higher runoff, higher rainfall. Aside from these, we know that there's such a thing called coral bleaching, and I'll dwell on that later. And there is also ocean acidification. For the rest of the presentation, I will only focus on sea level rise and ocean acidification.

Next slide please. So, what you see here is the actual sea level rise that is already happening in the Pacific. So red means that the ocean level is already rising up to eight millimeters per year. The rest of the world is actually rising at a rate of three point four (3.4), three point five millimeters (3.5 mm) per year. The Philippines is rising at a rate of seven (7) to ten (10). The ocean near the Philippines is rising twice to three (3) times that of the rest of the globe. The reason for this is because we're right next to the Pacific; it's the biggest ocean. As the ocean temperature increases, it will start to bloat and since the rotation of the Earth is towards us—the Pacific Ocean is towards us—then all that increase in sea level is actually going towards us.

Next slide please. The consequence of sea level rise is two-fold. One, there's actually an increase in erosion. The reason for this is you can see in this graph. Right now, erosion is only happening where there is ocean water. With even a slight increase in sea level—the seven (7) to ten millimeters (10 mm) per year—you're actually talking about exposure of tens or hundreds of meters of additional coast that is exposed. This is especially true for low-lying coast. For example, if you go around the Philippines, areas like Boracay, Sagay, Negros Occidental and Oriental, there's a huge part of those areas that are low-lying. So even if you're already four kilometers (4 km) inland, the elevation is just four meters(4 m) or less. That means you're going to expose a lot more land to possible erosion from the waves. And with increasing sea level rise, you're exposing more communities to this erosion. We're not even including storm surges in this story.

Next slide please. The other effect of sea level rise is a compromise of one of our very useful habitat, which are the mangroves. Mangroves act as nursery grounds for fish. So even if you're going to catch fish that is normally seen in the open ocean, as juveniles or as fingerlings, they're actually found within the mangrove roots. They tend to go there because predators cannot catch them there. So, if you compromise these mangroves, you're actually compromising the food security of the Philippines. The United Nations estimates that thirteen percent (13%) of the world's mangroves will disappear just due to sea level rise by 2100.

Next slide please. Aside from sea level rise, you actually have ocean acidification. Ocean acidification happens because, as carbon dioxide is incorporated into the seawater, it actually increases the H+ [hydrogen ions] in the ocean. And that decreases the pH. Ocean acidification is actually a little misnomer because the ocean really doesn't become acidic; it just becomes less basic. Most people don't know what basic means. It's basic if it's higher than seven (7); it's acidic if it's less than seven (7). We're not projecting anything less than seven (7) but we started out at around eight point four (8.4), now it's eight point fourteen (8.14). There's already a twenty six percent (26%) reduction. The pH is a logarithmic scale, so a zero point zero (0.0), zero point three (0.3) change is already a huge thing. And the prediction is by 2100, there will be one hundred seventy percent (170%) change in ocean pH. And the cold water corals, seventy percent (70%) of that is predicted to dissolve by 2100. The tropical coral reefs like ours are predicted to dissolve completely in six (6) months if we ever reach that pH. So, can you just imagine that?

Next slide please. We already know that the coral reefs are already compromised because of increase in temperature. We've heard of coral bleaching. Coral bleaching happens because coral reef is actually an animal. It has a symbiont. It has a partner that's an algae inside its tissues. The algae is the one that produces the carbohydrate that the animal needs. So, if it's heated, the environment is not good for the algae; it tends to get out of the tissue, resulting in a loss of color. Imagine yourself having a no-carb diet forever. It's okay if you have a no-carb diet for a few weeks but if it's continued forever and you only get enough protein that will pass by—so the coral at night actually tries to catch things from the water and eats it— it will die eventually. So if the heating only happens in a short duration, it will revive. If you only have a no-carb diet for two (2) weeks, you'll survive. But if you have a no-carb diet forever, then it will actually die.

Next slide please. So along with ocean acidification, that's a problem. If you're already…

PANEL CHAIR CADIZ:

Excuse me, Doctor David.

DR. DAVID:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Can we request our technical people… how come the sound is not consistent? Can you fix the mic?

Alright, proceed.

DR. DAVID:

So, if you have ocean acidification on top of the increase in temperature, what you have is a compromised integrity of the coral skeleton itself. So not only will the coral die, that's the tissue on top of the reef, but the skeleton itself will start dying out.

Next slide please. And when that happens, you start dissolving the coral reefs that are there. Imagine if you always eat something acidic, your teeth, that's the commercial of some of the toothpaste companies, that if you put your tooth inside a more acidic environment, then it starts dissolving. It's the same thing. Your coral reef will start dissolving and if you can dissolve the reef, you also have the possibility of dissolving what we call plankton. The plankton is the base of all life in the ocean; everything starts from the plankton. If you take a look at the food pyramid, the bottom of that is the plankton. And a lot of them have calcium carbonate as part of their bodies, so that will also start dissolving. So, that has a cascade effect to the next level. The smaller fish will disappear, the bigger fish that hunt the smaller fish will also disappear. So, you have two (2) ways of compromising: coral reef dissolving and also the plankton.

Next slide please. Aside from affecting food security, there's an additional problem with an exacerbated erosion. The problem with this is shown in this graph. If you have a good coral reef, which is shown on the right side, even with an increase in storminess, increase strength in storm, that coral reef act as a sea wall, as a natural sea wall. It will actually stop the big waves from coming in. But if we don't have that, then the big waves will reach the shore and, additionally, provide energy for the erosion.

Next slide please. This is an example of what could happen. In Gusa, Cagayan de Oro, historically, they have harvested coral reefs to be part of the church, to be part of the historical buildings. They've been harvesting since the last century. But the consequence of that is their coast is slowly eroding, such that houses that were built before that seem to be far from the sea are now right next to the sea. So, the same thing will happen if you actually start dissolving the reef due to acidification.

Next slide please. So, if we take a look at this, these are the big producers of carbon dioxide (CO_2). They're the big producers of carbon dioxide (CO_2). The Philippines doesn't produce much carbon dioxide (CO_2), we produce about less than two percent (2%). China, the United States, India, and Russia are the big ones that actually produce.

Okay, next slide please. On top of this, there's sort of this global trend of acidification. There's an exacerbating factor in some of our waters. A lot of our mariculture overfeed their fish, resulting in what is called eutrophication. So, there are more nutrients in the sea surrounding these mariculture areas. And what we see is, as this decomposes, it also produces carbon dioxide, which then turns the ocean water acidic. If you take a look at the figures, the ocean water near this mariculture sites, the pH has gone all the way down to about seven point fifty-four (7.54), which is even lower than the global. So, there is already a global problem and you exacerbate it with more local problem.

Next slide please. And this should be of concern to us because there are a lot of ongoing and proposed mariculture in the Philippines, so that we can provide food for our people. But, in so doing, we're actually start compromising the same food supply that we're trying to produce. So, on the left are all the ongoing and future mariculture sites. On the right is a map of harmful algal blooms. Harmful algal blooms are what's commonly known as red tide. They usually proliferate in areas where there's already eutrophication that's happening. So, there's proof of eutrophication already happening. What is needed now is that we measure the pH in these as well.

Last slide, please. In summary, an increased carbon dioxide in the atmosphere results in global temperature increase resulting in ocean thermal expansion, also known as sea level rise. Increased carbon dioxide in the atmosphere results in lowering of ocean pH—I have to correct the pH, it should be a small p large H—also known as acidification. Each of this compromised global food fish availability by compromising both the coastal habitat, the phytoplankton, and also tropical coastal integrity, meaning erosion—more erosion around our

coastal areas. In addition, local efforts to augment food security through mariculture, if mismanaged, can further exacerbate the food security issue through eutrophication, resulting in localized additional reduction in ocean pH and harmful algal blooms.

Thank you, Your Honors.

ATTY. PAUDAC:

May we be allowed to just ask a question?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

In the beginning, Doctor David, you mentioned that the fossil fuel, the carbon dioxide emitted, contributed to ocean acidification and the warming of oceans that affected the marine living things in the environment. By your expertise—each one of you, please—how then can the problem be addressed and any recommendation?

DR. DAVID:

On a local scale, I look at it this way: if your family already has a heart problem tendency, you have a choice. You either ignore that and suffer the consequence or you try and live a healthy lifestyle so maybe you have a fighting chance. So, if you do something about the local problem, then you have a fighting chance. But there's still that tendency because there's the global scale. So, if something can be done on the global scale, then that will help even more.

DR. MCGLONE:

I think there are two (2) ways how we can solve it. One is you can adapt.

PANEL CHAIR CADIZ:

Excuse me, let's identify this witness for the benefit of the transcriptionist. So, who is the witness who will be answering that question?

ATTY. PAUDAC:

Doctor Maria Lourdes McGlone.

PANEL CHAIR CADIZ:

Alright. Did you get it? Please proceed.

DR. MCGLONE:

Okay, as I was mentioning, we can either adapt or we can mitigate. Common adaption method would be, you build your houses away from the shore or you paint your roof white instead of colored. So, things like that. And then you have water impoundments to catch the rain, so you're prepared for periods of drought. For mitigation, there is reducing carbon footprint and also using alternative sources of energy.

ATTY. PAUDAC:

Sorry. The next resource person is Doctor Porfirio Aliño.

DR. ALIÑO:

For example, I will mainly concentrate on adding towards reducing, for example, effects on coral bleaching. We need to have more areas for so called marine protected areas for refuge and to have reserves for them to be able to bounce back when they are affected by coral bleaching.

ATTY. PAUDAC:

Your Honors, that will be all for the counsel. If you do have any questions, Your Honors.

PANEL CHAIR CADIZ:

Thank you very much, Counsel, and to the resource persons. Are there questions? Okay, Chairman Gascon…

CHAIR GASCON:

To our resource persons, thank you very much for the very valuable information. I do have a couple of questions. First, with respect to and, this is immediate follow-up question. From what we just heard in terms of mitigation initiatives, you mentioned that we should try and reduce coral bleaching by creating marine protected areas. Does this suggest that it's still possible, after we reach the situation where you showed very clearly with the photograph, that corals die, that if we provide more protected areas, that corals can regrow and expand again? Is that possible?

DR. ALIÑO:

We actually provide areas for refuge. In effect, some of the areas will not be able to recover but the areas which are allocated for refuge will be able to provide additional supply for recovery instead of having them all die.

DR. DAVID:

Mr. Chairman, may I add something?

CHAIR GASCON:

Please.

DR. DAVID:

Think of it as a farm where, in one farm, you only have one type of crop, say coconut and another farm has multiple crops. So, if pest comes through the farm, and it's a coconut pest, those that are only monospecies, they will completely die off, but in the other farm, there will be some survivors. So, it's the same concept. What we have going for us in the Philippines, unlike the rest of the world, is that we have a high biodiversity so there might be species that will survive some of the acidification that will happen. We're trying to protect as many as we can in the hopes that some of these will be survivors. But still, even if those specific species will survive —if you talk about the coral reef—there will still be devastation reef-wide. So, we have to do what we can.

CHAIR GASCON:

Again, there's a possibility of survival but, once corals die, even if we make efforts to reduce the acidification, those corals will not regrow?

DR. DAVID:

The coral reefs, the skeleton are good substrates for new reefs to recruit on if the pressure of acidification and all the rest are removed. So, there is hope.

CHAIR GASCON:

The scenario you showed earlier where you had the dead corals, if there is sufficient effort to reduce acidification, it may still be possible for at least some, if not all, specie of corals to regrow and to again, populate the sea bed?

DR. DAVID:

Yes, Your Honor.

CHAIR GASCON:

Thank you. I also want to ask—and I asked this a little bit yesterday—but you showed again a very graphic photograph of the rise of sea levels impacting the West Pacific area, including the Philippines. And you also mentioned that because of the tilt of the earth, the waves are actually moving in the direction of our islands. Aside from the data about the rise in sea levels, have there been models, developed either here or elsewhere, to show the impact over time? You mentioned a date of 2100, that's not too far away. Probably I won't live that long but maybe some other people in this room will. Are there models that suggest how much in terms of land area will be lost in the Pacific seaboard, over time, let's say if the rate continues as it is? How much land will be lost in Leyte, Samar, Eastern Mindanao, Quezon, Bicol, for example, in the next ten (10) years, fifteen (15) years, twenty (20) years? And then, of course, necessarily, how many populations would be affected, populations that will need to move further inland? Is that data available?

DR. DAVID:

There are two (2) global models, Your Honor. One is a German model that's predicting a fifteen millimeter (15 m) per year increase. So, the seven (7) to ten (10) that we're currently measuring is conservative. The models are predicting fifteen (15). And the other one is a model that was done by the UK that actually considered population or the globe. But it's a little coarse to actually name specific areas in the Philippines. The estimate is by 2100, something like between one point one million (1.1 M) to four million (4 M) Filipinos will be constantly flooded if they don't leave the coastal areas. It's a little coarse because it's country-wide. There's a DOST [Department of

Science and Technology] LiDAR [Light Detection and Ranging] program, which actually measured the height of the land above sea level in most areas of the Philippines and they would be the ones to be able to answer, from their data, exactly how much land area we're talking about on a local scale.

CHAIR GASCON:

So, Mr. Chairman, I think we might benefit from requesting DENR- DOST rather, and the LiDAR project to give us any relevant information on that matter, in perhaps succeeding hearings.

PANEL CHAIR CADIZ:

So, at this point, may I ask the counsels for petitioners: are you going to present the witness from the DOST?

ATTY. SORIANO:

Not in the current list, Your Honors, but definitely it's something that we will seek after this hearing.

PANEL CHAIR CADIZ:

Alright, because if you're not going to call them as petitioners, then the Panel can send them an invitation. What is your preference? Are you going to present them or do you prefer the Panel to call them, to invite them?

ATTY. SORIANO:

As this has already been suggested by the honorable Panel, I think, Your Honor, it will be more appropriate that the Panel, the Honorable Commission invites the DOST expert or resource person.

PANEL CHAIR CADIZ:

Alright, clerk of the Panel, please take note of that. We will send an invite to the DOST resource person. Our main schedule is already full; or would you be able to accommodate… because it would be more beneficial for the Panel to have this witness testify as soon as possible as a follow-through to this testimony?

ATTY. SORIANO:

For the next public hearing, Your Honor, I believe that's in May, it's still very flexible.

PANEL CHAIR CADIZ:

Alright, so the clerk is instructed to send a letter of invitation to the appropriate DOST resource person for May. Yes, Chairman?

CHAIR GASCON:

Thank you, Mr. Chairman. I have one last query. Aside from the impact on coastal areas and the push on populations, I also note in your presentation earlier that you highlighted that production of food will also be negatively impacted. And, yesterday, I note, we listened to a fisherfolk from Alabat, Quezon who described that the fish catch over a period of time has been impacted significantly. And then now, you, in a sense, have validated that by showing in your graphs that there is in fact a correlation with the temperature rise? Or is it the acidification?

DR. DAVID:

Both the temperature, sea level rise—all three (3), Your Honor, temperature, sea level rise, and ocean acidification.

CHAIR GASCON:

All three (3) impact on the population of fish in the ocean.

DR. DAVID:

Yes, Your Honor.

CHAIR GASCON:

And you highlighted here again, we are in the danger zone as the Philippines, geographically speaking, in terms of this reality. I think, Mr. Chair, that maybe the other expert information we will require is from the BFAR, the Bureau of Fisheries and Aquatic Resources, because it's important for us to understand and appreciate over time—let's say over the next five (5), ten (10) years—the areas affected. At least, the areas that have been marked red in the graphs where we've seen so far, that there will be significant reductions in fish stocks over time. And I think it's important that we understand this because this of course directly impacts on the livelihood of many people who rely on fishing. Would our panel have any information about that? About the data on actual fish stocks, because I understand you're all marine biology experts and scientists. Are there colleagues of yours who are doing or focusing on that aspect about fish stocks?

DR. DAVID:

Yes, Your Honor, BFAR would definitely fit the bill, but also specific people are studying food fish, which are UP Visayas and also Doctor Hilomen of DENR. They're looking into the climate impact on fisheries stock.

CHAIR GASCON:

I propose Mr. Chair, that we also try and secure that information.

PANEL CHAIR CADIZ:

May I know from counsels for petitioners if they are intending to present the witness that has been cited? Witnesses?

ATTY. SORIANO:

Thank you, Your Honors, for raising that and we did, in fact, reach out to the appropriate agency to give us data and to offer an expert or a resource person who can speak on that topic: the state of the fishing sector, in the light of the climate change impacts and ocean acidification. And that will be presented in May, Your Honors.

PANEL CHAIR CADIZ:

Alright, but is this the same witness that has been mentioned by our resource person now?

ATTY. SORIANO:

Same agency, Your Honors, and I think Doctor Hilomen, can also be invited.

PANEL CHAIR CADIZ:

Okay, so we will defer to your judgment, as counsels for petitioners, on who are the expert witnesses that you will be presenting before the Panel on this matter.

ATTY. SORIANO:

Thank you, Your Honors.

PANEL CHAIR CADIZ:

But if the Panel is not satisfied, then, by all means, we will send invites to the other resource persons that have been cited.

Commissioner Pimentel-Gana will have some questions.

COMMISSIONER PIMENTEL-GANA:

Thank you. You know, Madame Resource Person, you did mention earlier about land erosion that caused a lack of reef protection and the picture that was shown was actually of Gusa, Cagayan de Oro, and it bothered me. And now you were saying that there was harvesting of corals that led to such an erosion. You said it was done through centuries already. So how long actually did it take for this kind of situation to have risen?

DR. DAVID:

Your Honor, because when you do harvest and there's no increase in sea level and storm intensity, then the coastal integrity will be stable for a while. But with the harvesting and then an increasing sea level, then more and more of that coast was exposed. So, now, because there were no corals and increase in sea level, that's the reason why that resulted in that. So, in decades, in some areas it's very dramatic, within months. There are areas in Zambales, for example, where they showed a reduction of the coast to up to forty meters (40 m) in just a matter of months if a storm passes there with all these exacerbating factors.

COMM. PIMENTEL-GANA:

And it's also sometimes man-induced?

DR. DAVID:

Yes.

COMM. PIMENTEL-GANA:

Because it's a way of livelihood for people to collect coral. Now I was also going to ask you: where else in the Philippines has this actually happened?

DR. DAVID:

Actually, Your Honor, unfortunately, if you go around the Philippines and walk the beaches, there are a lot—almost all the islands have suffered from erosion. If you see, for example, an exposed coconut root, that means that that area has eroded because coconuts do not grow with their roots outside the sand, but now they're exposed. So, if you walk in Boracay or any beach, and you see exposed coconut roots, that means that that area has actually eroded. And some of those are about one (1) to one point five meters (1.5 m) in height exposure already.

COMM. PIMENTEL-GANA:

Is there anyway that man can alleviate the situation?

DR. DAVID:

There are soft engineering options and hard engineering options. The soft engineering is much more preferred because there's a lot of benefits in its favor. In muddy areas, if you replant mangroves, then actually that holds on to the mud and it will lessen the erosion. In sandy areas, if you replant beach forests and allow a lot of our creeping plants to invade the beach again, then that will also hold that material.

In areas where there's now habitation, there's a community, sometimes you have to employ hard engineering options but that's very expensive. A kilometer of sea wall, for example, is easily Fifty Million Pesos (PhP

50,000,000.00), just a kilometer. You're talking about a sea wall, which requires regular maintenance. It's quite expensive to keep repairing a sea wall. And the other option is to start moving people out of the coast. The forty meter (40 m) easement in some areas is enough, but in some low-lying areas, forty meters (40 m) is not enough. It has to be a slope-driven easement. In low-lying slopes, you have to evacuate them even further. If it's a steep slope, then forty meters (40 m) is enough.

COMM. PIMENTEL-GANA:

Has government done anything to that effect? Has it initiated any sort of recovery like what you're saying?

DR. DAVID:

To my knowledge, the enhanced CLUP [Comprehensive Land Use Plan] already has started giving LGUs [Local Government Units] a process on how to actually measure the potential for sea level rise in their area. So, if the LGUs follow that, then they would at least know the extent of sea level rise in their area.

COMM. PIMENTEL-GANA:

Thank you.

PANEL CHAIR CADIZ:

Thank you very much, Commissioner Gwen. Okay, there's a follow-up question from Chairman Gascon.

CHAIR GASCON:

I have a question proceeding from this most recent exchange of questions and answers relating to what can be done—soft engineering, hard engineering, mitigating, efforts—and the costs. But I'm wondering earlier in private, now out loud. You showed in one slide that most of the carbon dioxide (CO_2)

emissions from coal and oil, et cetera, are from countries not the Philippines. And you actually said that the Philippines only contributes less than two percent (2%). You mentioned China, United States, India, and Russia, in particular, taking the bulk of the share of emissions of carbon dioxide (CO_2), which already relates to what's happening to our seas. So, I was just wondering whether all of these mitigating initiatives— Fifty Million Pesos (PhP 50,000,000.00) per kilometer and then you need to redo it because it's under water and therefore you will be able to keep it in tact the whole time— would all of these mitigating efforts be like rearranging furniture on the Titanic? Unless there are significant reductions made by these states that have been contributing to carbon dioxide (CO_2) emissions that impact on our seas, as well as the companies that are of course domiciled therein. Or would doing these mitigating efforts still make a difference regardless?

DR. DAVID:

If you read the IPCC-5 report, you will see that most of the models have several scenarios depending on the carbon dioxide (CO_2) emission of the globe. In the good scenarios where we curb the production of carbon dioxide (CO_2), then mitigation in the local scale would make a difference. But in some scenarios where we do not stop how we are using and actually even increase the use of carbon dioxide (CO_2), then you're either talking about a huge amount of resources to actually do something locally or even that is not enough.

CHAIR GASCON:

So, you're saying, yes, mitigating efforts like what you suggest will help but it can't be purely localized. There has to be international action and ultimately, the global players, states as well as the global carbons, need to also contribute to that overall effort.

DR. DAVID:

Yes, Your Honor.

CHAIR GASCON:

Otherwise, it will be like rearranging furniture on the Titanic.

DR. DAVID:

Yes, Your Honor. And we still have to start buying land twenty meters (20 m) above sea level to be safe.

CHAIR GASCON:

Thank you.

ATTY. PAUDAC:

Your Honors, may we just ask if Doctor David, Doctors McGlone and Aliño if there is anything that they wanted to add based on their separate expertise to the discussion? Just for last thoughts.

DR. ALIÑO:

I think I'd like to add, in relation to being fair—sort of bearing the costs of protecting the biodiversity of this planet. I think it should be a shared cost because as mentioned, it's a question of who is also the source of the problem. I think if we have added protection, for example, we are actually providing service to humanity. So, we should also have a shared cost in providing that service to humanity.

ATTY. PAUDAC:

Doctor McGlone?

DR. MCGLONE:

Maybe I'd like to make a pitch for the local scenario because we are seeing acidification that's much more than what is predicted eighty (80) years from now in 2100. I think local efforts for protecting the environment should be heightened and that's I think what should be in the consciousness of the Philippines on top of the global scenario.

ATTY. PAUDAC:

Your Honors, if there are no other questions, may we move that the witnesses be excused unless they will be recalled?

PANEL CHAIR CADIZ:

For lack of material time, for the moment, we would like to thank our three (3) witnesses, resource persons. But we would request, also, if you could make yourselves available for a later date, for further questioning should the Panel deem it necessary.

So, Counsel, may we now proceed to your next set of witnesses?

ATTY. SORIANO:

May we now call on our next witness, Your Honors?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. SORIANO:

We are requesting our next witness, Mr. Ernesto Cruz, to take the stand please.

PANEL CHAIR CADIZ:

Attorney Lauron, please swear-in the witness.

CHR LEGAL OFFICER:

Kindly raise your right hand please. Do you solemnly swear to tell the truth, the whole truth, and nothing but the truth in this national inquiry under penalties provided by the law?

MR. CRUZ:

Yes, I do.

PANEL CHAIR CADIZ:

Counsel, please proceed.

MR. CRUZ:

Pwede na ko magstart? (May I start?)

ATTY. SORIANO:

We are presenting, Your Honors, Mr. Ernesto Cruz, a driver and the president of the National Confederation of Transport Workers Union. He is from Quezon City and the purpose of his presentation here is to share how extreme heat and other weather-related events had impacted his livelihood as a jeepney driver and he will also share the concerns of the transport sector.

So for preliminary questions, Your Honors, I will be speaking in Filipino. I have here a document with the title "*Salaysay ni Ginoong Ernesto Cruz*,"

consisting of three pages. And I'm now approaching the resource person for confirmation.

Mr. Cruz, *ito po ay isang dokumento na natanggap namin mula sa inyo. Pakisabi po dito sa hearing na ito kung natatandaan ninyo ang dokumentong ito*. (Mr. Cruz, here is a document we received from you. Please state in this hearing if you recall this document.)

MR. CRUZ:

Totoo iyan, your Honor. (That is true, your Honor.)

ATTY. SORIANO:

At sa huling pahina po ng dokumentong ito ay may nakasulat na pangalang 'Ernesto Cruz' *na mayroong pirma sa ibabaw ng pangalan. Kilala po ba ninyo ang pirmang ito*?

(In the last page of this document there appears a signature above the name Ernesto Cruz. Do you recognize this signature?)

MR. CRUZ:

Ito ho yung aking pirma. (That is my signature.)

ATTY. SORIANO:

Your Honors, witness has confirmed the document as his statement and the signature as his signature. So may we now request that this document entitled "*Salaysay ni Ginoong Ernesto Cruz*" be marked as Exhibit HH?

PANEL CHAIR CADIZ:

Attorney Esguerra? First page, please mark it as Exhibit HH. Second page, HH-1. The last page, HH-2, and the signature therein as HH-2-A.

ATTY. SORIANO:

And to continue, Your Honors, our witness Mr. Cruz will present a summary of his statement and you may now start, Mr. Cruz.

MR. CRUZ:

Magandang umaga po, ano, sa lahat sa ating mga…(Good morning to all)

PANEL CHAIR CADIZ:

Can the witness please be assisted so that his testimony is properly recorded?

(To the witness) Pakilapit lang po sa microphone. (Please go near the microphone.)

MR. CRUZ:

Magandang umaga po sa lahat, sa ating mga Honorable, ako nga po pala si Ernesto Cruz, taga Mandaluyong po, taga Hulo, … yung nga po minsan… nangangarap na dati, dahil nga kinukwento ng lola ko, yung lugar namin talagang madalas daw palang pag-shootingan ng pelikula nung araw, yung Pasig River, malapit po kami sa ilog ko eh. At sinasabi nga ng nanay ko, doon nag-lalaba ng lampin namin dahil sa ganda ng tubig. Yung city hall *ngayon na yung* Addition Hills *na, na puro iskwater, doon kami nanghuhuli ng ibon dahil nga palayan yan eh. Ang ganda!*

(Good morning to everyone. I am Ernesto Cruz from Mandaluyong, from Hulo. I remember my grandmother used to tell me how our neighbourhood used to be the shooting location of many movies because we lived near the

river. My mother remembers she used to wash our diapers in the river because the water was so clean. The city hall in Addition Hills, that is now full of squatters—that is where we used to catch birds because the place then was a rice field. It was beautiful!)

Tapos puro palay, tapos yung open kanal na ngayon, yun ang hulihan ng mga tutubi, dahil nga bukid sya, ang ganda e. Tapos yung paligid naman namin, taniman daw ng, sabi ng nanay ko naman, ng mga mais, kamote, eh ngayon eh, pagkadumungaw ka sa bintana pwede kayo maghalikan ng kapitbahay eh, dikit dikit na, eh masarap lang alalahanin siguro yung ganun diba? Ang tanong kasi, ba't ba ako napunta sa pagmamaneho, dito sa transport*? Yun nga po, natapos ng pag-aaral, tapos uso naman noon yung abroad, umabrod. Noong magka-*abroad*, sabi ko nga sa sarili ko nakakasampung taon na ako sa pagkakaabrod, parang yung kalahati ng buhay ko'y nasa abrod na, eh yung pamilya ko.*

(Then there are ricefields. Then the open canal today, that was where we used to catch dragonflies because it was also a farmland. My mother said there were corn and sweet potato planted where we actually lived. Now, when you look out our window you can almost kiss your neighbor in the other window because we live so close to each other. It's nice to remember the old days… the question is… how did I end up being a driver? I finished college, and back then working abroad was a big thing, so I went abroad. I told myself that I have stayed there for ten (10) years already and it feels like I've spend half my life abroad, what about my family?)

*So nag-decide akong bumili ng jeep, dito mamasada, dito na mag-*stay *sa Pilipinas, at ang pagkakatanda ko 2004 ako nag-istart mamasada. Yun nga lang, talagang nung mga panahon na yun, 2004, kaya ko pa yung* twelve (12) hours to fourteen (14) hours *na trabaho sa pagmamaneho, pero* lately *nga pagkakatanda ko mga 2013 palang o 2014 o 2012, parang hindi na kaya nung katawan ko, dahil nga syempre, sobrang init. Yung init na yun minsan pagka nakapila dyan sa* Star Mall*… sa* Star Mall *po kasi ang* terminal *namin, doon sa* basement *pagka syempre matagal yung pila inaabot minsan ng isang oras, nagkukwentuhan… yun bang init na yun eh tinatanong nila talagang ano ba… dahil nga minsan napapanood sa* TV *yung sinasabi nilang* climate change*, kaya nagiging bukang bibig siya nung ibang nakaka-*relate *na mga* driver *din, na epekto ba to ng* climate change*? Kaya minsan, ganon ang sinasabi baka* climate change *na yan. Lalo na pag me na-*stroke *na kasama, o* lately *lang, mga isang taon lang mahigit, namatay yung* Vice President *ko, na kumpare ko pa, atake rin. So inaano namin na kaya sa ngayon siguro madami-dami na yung bumibyahe sa amin ng* half day *na lang, natatakot din sa mga maaaring mangyari sa kanila sa sobrang init nga raw tapos sasabayan ka pa*

ng traffic*, makakadikit mo yung mga* truck *sa* Shaw Boulevard *na mainit ang makina, parang natatakot din na bumiyahe ng ganon. Pero ang nakakaawa syempre dala ng pangangailangan, kailangan nilang tiisin sa pamamasada ng* fourteen (14) hours to sixteen (16) hours *na alam nila yung* risk *nila. Kaya siguro ang ginagawa… ingat na lang sa sarili. Pero kapag yung aktwal na namamasada ka talagang grabe. Kaya yung din ang tanong namin, epekto na ba to ng pabago-bagong panahon? Pati yung kinikita syempre pinag-uusapan dun sa pilahan, na kapag tatagal yung ganitong sitwasyon, gaano magiging epekto nito na kapag talagang hindi na kakayaning bumyahe ng ganong kahaba pa. Syempre apektado yung kinikita lalo na't may pinag-aaral na marami.*

(So, I decided to come home. I bought a jeep in 2004 and that's when I became a jeepney driver. I remember back then I could still drive for twelve (12) to fourteen (14) hours. But lately, I remember as far back as 2012, it seems my body could no longer tolerate the heat. Our terminal was in the basement of Star Mall. Sometimes we would be in line for an hour, we would talk about the heat; it was what we've been hearing on TV about climate change. About a year ago, the Vice President of our organization died of a heart attack. He was a good friend. The other drivers are probably afraid the same thing will happen to them so they now choose to work for only half of the day. They're afraid of the heat, compounded by traffic, and exhaust fumes from trucks. But they have no choice, they have to ply their route for fourteen (14) to sixteen (16) hours even though they know the risks. That is why we always ask ourselves, is this an effect of climate change? We talk about our income—what will happen to us if we can no longer ply our routes the way we did? Our income is affected, especially those with many children to send to school.)

*Ako, kahit paano medyo nakaka-*survive *ngayon dahil nakatapos na yung isang anak ko, yung panganay, kaya yung bunso na lang yung pinag-aaral ngayon. Kaya pinagkakasya yung kita ngayon sa* half day *na pagbyahe. Ang nakakaawa yung mga mga maraming anak syempre na pinipilit na bumiyahe ng mahabang oras bagamat mainit, walang* choice *e kailangan bumiyahe sila. Yun na lang ang binibilin natin sa kanila… kaya ang mga drayber pag nakita niyo lagi yang may dalang bote na may tubig na puro yelo… yon dahil nga pag sobrang init syempre… huwag kayong maaasar dun sa driver na habang bumabiyahe sumisimple lang* (drinking) *kahit na medyo umaandar, siguro naiinitan lang yung kagaya ko kahit ako pag-bumibyahe ako talagang kahit medyo umaandar ng kaunti, pag natigil ko, inom… ganon. Dala siguro ng pangangailangan natin 'yon.*

(I manage to survive because the eldest of my children has already finished school, only the youngest is currently studying. I try to make do with a half-day's worth of income. I pity the drivers who have many children; they have to ply their routes for long hours despite the heat because they don't have a choice. We always tell them to drink water often. That's why when you see drivers sneaking in a drink of water even while the jeep is moving, please understand them. Even I would do the same thing. We need to do it.)

*Yun lang ang maise-*share *ko sa aking karanasan. At sana nga masagot yung tanong na epekto na ba 'yon ng pabago-bagong klima nararanasan naming init sa kalye? Pati yung makina kasi istorbo sa amin… maya't-maya nagkakarga ka ng tubig dahil inaalala mo mag-*overheat*, ma-*towing *ka sa kalye, kaya tumabi ka muna maglagay ng tubig sa makina. Yung mga bagay na 'yon e masasabi namin, pati yung binabash kami sa FB* [Facebook]*, na kami raw ang nag-didistribute ng makakapal na usok. Alam naman natin na puro* surplus *yung ginagamit sa Pilipinas, partikular ang makina, tapos yung* diesel *na ginagamit namin, gusto ba naming gamitin ng gamitin e walang ibang* choice *kundi* fossil fuel *lang. Kaya sa NCTU* [National Confederation of Transportworkers Union] *kung mapupuna niyo dun sa PUV* [Public Utility Vehicle] modernization*, pumuposisyon yun na* "no to phase out" *kami* without just transition*. Dapat may* transition *nga dahil ang hirap e kung* phase out *mo kaagad kami ngayon nang 'di mo kami bibigyan ng pagkakataon. Maraming madi-*displace *na* operator *at tsaka drayber. 'Yun lang po, maraming salamat po.*

(That is all I can share. I hope we can answer the question of whether climate change is indeed responsible for the extreme heat we experience out in the streets. It affects even our jeep's engine; you constantly have to fill it in with water to avoid overheating, lest we will be towed. We get bashed on FB [Facebook]; people are saying we are responsible for the pollution in the streets. But we only use surplus engines here in the Philippines. The diesel fuel that we use… we have no choice but to use fossil fuel. That is why our position at the NCTU [National Confederation of Transportworkers Union] regarding the PUV [Public Utility Vehicle] modernization is, "no to phase-out" without just transition. They cannot just phase us out, we should be given a chance to make the transition. That is all. Thank you very much.)

ATTY. SORIANO:

Your Honor, we have couple of questions to help elaborate and clarify. *Mr. Cruz, iyong pong nasabi ninyo na matindi ang epekto sa inyo ng matinding*

init, mayroon pa po bang iba pang weather-related events *na masasabi ninyong nakakaapekto pa sa inyong pagmamaneho at buhay?*

(Mr. Cruz, apart from what you said about the extreme heat, are there other weather-related events that affect your life and livelihood?)

MR. CRUZ:

Pagka tag-ulan ho tsaka pagka po bumaha walang byahe niyan. Ginagawan naman ng paraan ng lokal na tinataas yung kalsada pero hindi kinakaya kasi nga pag lumakas yung buhos ng ulan lalo na nung Ondoy, hindi ka na makakabiyahe non. Hindi naman pwede isapalaran yung jeep *na ilusong sa biyahe dahil pag pinasok ang makina non, sira sigurado. Kaya yang ulan at init parehong kalaban.*

(When it rains and floods, we cannot ply our routes. The local government is working on elevating the streets, but it is not enough because if it rains really hard, like what happened in Ondoy, you can no longer drive. We cannot risk driving our jeeps in floodwaters because the engine will surely be damaged. Heat and rain are both enemies.)

ATTY. SORIANO:

*At yung tindi ng init, sinabi niyo kaninang napansin ninyong mas matindi nitong mga nakaraang taon. Kumusta naman po ang ulan? Paano niyo ide-*describe *ito*? (And you said it's hotter now compared to back then. What about the rain these days? How would you describe it?)

MR. CRUZ:

Yung ulan naman ho syempre, yung pabago-bagong panahon nga minsan e nararanasan din ngayon yung sobrang init tapos bigla namang uulan. Parang ang hirap ng pattern *ngayon ng panahon sinasabi nga nung mga* driver *syempre, mga miyembro, abnormal na talaga panahon ano, sinasabing ganon… bukang bibig yung* climate change*, dahil nga init biglang uulan, pagka naman umulan sumobra, kaya doble apektado, mainit o bumagyo siguradong sapul ang kikitain ng mga* driver *na namamasada.* (What we notice is that the weather patterns are becoming abnormal. One day it's very

hot and, then, suddenly it begins to rain. Whether it's extreme heat or heavy rain, our incomes are affected.)

ATTY. SORIANO:

Salamat po. Nasabi nyo po kanina na parang nasisisi ba kayo? Paliwanag niyo po ng kaunti pa. (You said that you are being blamed for this [pollution]. Can you explain this further?)

MR. CRUZ:

*Yun nga ho e. Ang mga drayber kasi syempre pagka matagal ang pila… kaya na rin nilang bumili ng cellphone… tapos nakiki-*tap *ng* WiFi *dun sa* mall *na libre, habang nakapila yan nagfe-*Facebook *yan di ba? Minsan nga me magpo-*post *na grabe usok nung* jeep*, susundan ng mga comment yun na "kayo wala kayo, mga impakto kayo, mga murang katakot-takot." Ibig sabihin nga, bakit kami sinisisi ng husto 'di ba, e ayon nga dun sa* presentation *nina doktora kanina ang* major contributor *nito yung malalaking bansa, napakaliit ng nanggagaling sa amin. Pero bakit ganon na kami ang sinisisi ng husto? Pati nga dito, kung gugustuhin naman namin na bago ang mga sasakyan, kung hindi naman kami tutulungan ng gobyerno, hindi rin namin makakaya, wala kaming* choice. *Ang nasa* market *puro* surplus *na makina. Ang krudo na ikakarga mo galing sa mga gasolinahan, eh saan ka bibili ng krudo na malinis? Saan ka kukuhang makina na bago? Kung ano yung* available *sa paligid, natural yun lang ang ginagamit namin.*

(That's right. Drivers can now afford cellphones. When drivers are stuck in long lines, they can tap into the free WiFi in the mall where our terminal is. We log on to Facebook. Sometimes we see a picture posted of a jeep with heavy fumes, followed by comments like, "you are evil," followed further by profanities. But why are we being blamed? The presentation earlier showed that it is the bigger countries that are the culprits; what we contribute to pollution is minimal. We would want new vehicles, but if the government won't assist us, we won't be able to afford it. We have no choice. The vehicles out there in the market all have surplus engines. Where can we buy new engines? Where can we buy clean fuel? What we can find available, that's what we use.)

ATTY. SORIANO:

For my last question, your Honors. *Ano pong ibig sabihin ninyo ng "*transition*" kanina. Nang sinabi ninyong ang gusto lang naman ng inyong organisasyon ay* just transition. *Maaari po bang bigyan niyo kami ng ideya kung ano ang* just transition*?* (What does just transition mean? You said that is what your organization wants. Can you give us an idea what just transition is?)

MR. CRUZ:

Partikular ho dito sa PUV modernization*, ang sinasabi namin para maging* consistent *sila dun sa pagpe-*phase out *na unahin muna nila na huwag magparating dito ng mga makinang* surplus *dahil hindi sila parehas para sa amin. Nire-*require *mo kami na bumili ng bago pero ang* importation *ng* surplus *na makina patuloy, parang hindi* equal *di ba? Ini-*introduce *mo sa amin* electric*—yung* electric *na yon eh ang tanong lagi, palibhasa ako yung araw-araw din naman na namamasada, alam namin na yung makina namin ngayon na galing sa* Japan *na* Diesel*, oo nga* fossil fuel *siya, pero alam namin na matibay siya, at tatagal siya ng* fifteen (15) *o* twenty (20) *taon. Ngayon kung ii-*introduce *mo sa amin yun sinasabing* electric*, na hindi pa napapatunayan, oo nga't alam natin na napakaganda sa kalikasan nung* electric*, pero kung hindi napapatunayan na matibay yan at tatagal ng mga* at least *sampung (10) taon pataas, yun ang* worry *nung mga* operator *syempre at ng mga drayber. Babayaran mo ng ilang milyon siya, kung after ng* three (3) to four (4) years *masisira, paano na lang yung utang na hindi mo pa nga nababayaran, sira sira na?*

(This is in regard to PUV modernization in particular. To be consistent, what they need to do first is to keep the surplus engines from being sold here in the country. They [the government] need to be fair. They require us to buy new jeepneys, but importation of surplus engines continue. They want to introduce us to electric vehicles—but the question is, will they last? The jeepneys we use right now use fossil fuel, but we know it's reliable, it will last for fifteen (15) or twenty (20) years. We understand the benefits to nature of electric vehicles, but the electric jeepneys have not yet been proven to last ten (10) years or longer. The operators and drivers worry that, after they paid a couple of millions for it, it breaks down after three (3) to four (4) years. What happens when we go in debt for something that is already broken?)

Pero talagang sinasabi nga namin pati nga yung sinasabi namin na paano mo kami papalitan, paano mo kami pauutangin na makakaya nung mga driver *at* operator*, na hanggang ngayon wala pa ring* guidelines *ang gobyerno na ganon, na yun nga ang sinasabi, ang ginagawang solusyon yung tanggal-bulok, tanggal-usok. Ang sinasabi namin sa kanila, yun bang magiging solusyon niyo? Ibig sabihin, kung ipe-*phase-out *niyo kami ng* two (2) years from now*, siguro yung gagamitin naming pera na pampagawa ng sasakyan, maidagdag na lang dun sa puhunan para dun sa bagong sasakyan. Ang nangyayari ngayon, tanggalin bulok, tanggal usok—kaya kapag pumuwesto sila lalo na dun sa* Shaw Boulevard *walang bumibyahe, ang naapektuhan yung mga pasahero rin natural. Kaya lang naman dadaan kami dun sa harap ng nanghuhuli, sigurado kapag nahuli kami noon ang pinakamababang multa* Five Thousand Pesos (PhP 5,000.00)*, saan naman kami kukuha non? Kaya ang sinasabi nga naming,* willing *kaming magpalit dahil nga dito sa* climate change *na usapin pero dapat naman yung ayuda ng gobyerno ay talagang malinaw, kung paano kaming tutulungan, kasi nga kapag sa* corporation *napunta itong hanay ng mga* jeepney *na ito, ang sinasabi ko lang, yung mga* corporation *na ganid, syempre na alam naman natin na hindi sumusunod sa* labor standard *at hindi magpapasweldo ng tama sa mga kapwa ko mga tsuper at* operator*, eh kawawa. Kaya mas maganda sa hanay namin mapunta na* transport sector *na kami ang may-ari dahil alam namin at nakakasiguro kami na lahat ng benepisyo at sweldong maayos na makabubuhay ay maibibigay, kapag kami ang magmamay-ari ng aming* sector.

(But what we are saying, including what we have said, how can you replace us? How can the government loan us money when there are still no guidelines released? If we are to be phased out two (2) years from now, maybe what should happen is that the money which we should be using for repairs be used instead as additional capital to buy a new vehicle. But they want us out immediately with the "remove the damaged, remove the smoke" program. So, what happens is jeepney drivers no longer go out for fear of being penalized? They make us pay Five Thousand Pesos (PhP 5,000.00). Where do we get that kind of money? Ultimately, it is the passengers who are affected. What we are saying is, we want to buy new jeepneys, especially now with the issue of climate change, but government help must be clear. If big corporations take control of this new fleet of jeepneys, the corporations which only think about profits, they will not follow the labor standards; they will not be paying us drivers and operators a fair wage. It is better that they let us own these vehicles because we can be sure that all the benefits and just wage will be given if we own our sector.)

ATTY. SORIANO:

That is all, Your Honors.

PANEL CHAIR CADIZ:

Thank you very much, Mr. Witness and counsels. Before we proceed to the presentation of your other witnesses, we will have a ten-minute break.

[Bangs gavel]

[Break]

CLERK OF THE INQUIRY:

All rise. The Inquiry Panel Chairman of the NICC, Honorable Commissioner Roberto Eugenio T. Cadiz still presiding. Everyone may be seated.

PANEL CHAIR CADIZ:

[Bangs gavel]

Resuming the session, may we request the counsels to proceed to your next witness?

ATTY. MAYO-ANDA:

Yes, good morning again, Your Honors.

PANEL CHAIR CADIZ:

Good morning.

ATTY. MAYO-ANDA:

Our next witness for today is Doctor Victorio B. Molina. He's a Ph.D., in Environmental Science, and we would like to call him.

PANEL CHAIR CADIZ:

Please swear in the witness…

ATTY. MAYO-ANDA:

May I proceed now, Your Honor?

PANEL CHAIR CADIZ:

Yes.

ATTY. MAYO-ANDA:

Doctor Victorio Molina has public health as his area of work and study. He's an Associate Professor of the Department of Environmental and Occupational Health, College of Public Health, University of the Philippines-Manila. He obtained a degree in Civil Engineering from Bicol University and Environmental and Sanitary Engineering from the Mapua Institute of Technology. He has a Master's in Public Health from the College of Public Health, University of the Philippines-Manila, and has a Ph.D. in Environmental Science from the University of the Philippines-Los Baños. We are presenting our resource person, Doctor Victorio Molina, today for the purpose of sharing the impacts of climate change on public health. And may we proceed now, Your Honor, for preliminary questions?

PANEL CHAIR CADIZ:

Please do.

ATTY. MAYO-ANDA:

Now, Doctor Molina, I have here two (2) documents. The first document is entitled "Profile and Statement of Victorio B. Molina, Ph.D. in Environmental Science" consisting of three (3) pages and signed on March 19, 2018. Kindly go over this document if you recognize the same.

DR. MOLINA:

Yes, I recognize this.

ATTY. MAYO-ANDA:

On page three (3) of this document, there's a signature here. Could you identify the signature please?

DR. MOLINA:

This is my signature.

ATTY. MAYO-ANDA:

We would like to have this first three (3)-page document, Your Honors, marked.

PANEL CHAIR CADIZ:

Entitled "Profile and Statement"?

ATTY. MAYO-ANDA:

Yes.

PANEL CHAIR CADIZ:

Okay.

ATTY. MAYO-ANDA:

Of Victorio B. Molina marked as Exhibit…

PANEL CHAIR CADIZ:

II?

ATTY. MAYO-ANDA:

II series.

PANEL CHAIR CADIZ:

Attorney Esguerra, please mark the document.

ATTY. MAYO-ANDA:

Now, the second document, Your Honor, is a nine (9)-page PowerPoint presentation entitled "Health Impacts of Climate Change." Doctor Molina, could you go over this and tell us if you recognize the document?

DR. MOLINA:

Yes, I recognize this.

ATTY. MAYO-ANDA:

This PowerPoint presentation of our resource person consisting of nine (9) pages and entitled "Health Impacts of Climate Change," we would like to have this marked as Exhibit double J and series.

PANEL CHAIR CADIZ:

So just going back to Exhibit II… consisting of three (3) pages, you said?

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Okay, II, II-1, II-2, and the signature on the last page is II-2-A. And in regard to Exhibit JJ, how many pages is that?

ATTY. MAYO-ANDA:

Nine (9) pages, Your Honors.

PANEL CHAIR CADIZ:

Okay, series JJ up to JJ-8. Please proceed now.

ATTY. MAYO-ANDA:

Okay, thank you, Your Honor. At this point, we would like to request Doctor Victorio Molina to make his presentation.

DR. MOLINA:

Thank you very much and good morning, Your Honors.

PANEL CHAIR CADIZ:

Good morning.

DR. MOLINA:

Let me walk you through the health impacts of climate change on human health. And, at present, it's no longer debated in the academic group whether there is climate change or not. In fact, if you look at the literature, there is actually sufficient evidence that indeed there is climate change caused by anthropogenic sources, meaning that the climate change that we are experiencing now is due to man-made activities.

So, on the first slide, if I may, I would like to quote no less than the Director General of the World Health Organization, Doctor Margaret Chan. She says, "Climate change is the greatest threat to global health in the 21st century." And the same organization on the next slide actually estimates the impacts on health of climate change and, in 2000, they were able to estimate around one hundred sisty-six thousand (166,000) deaths that are attributable to climate change. And also about five point five million (5.5 M) DALYs were also attributed to climate change. DALY is the Disability-Adjusted Life Year, meaning that because of climate change, about five point five million (5.5 M) years of productive life lost because of disability incurred by the people was actually recorded.

And the next slide. Actually, this is just a WHO definition of vulnerability. I would like to mention at this point that the Philippines is highly vulnerable for many reasons. The first reason for our vulnerability to climate change is

basically in terms of our location. Actually, it was manifested by the former resource person this morning, but just our mere location in the globe, near the equator, and because of the movement of the Earth, we are highly vulnerable. Of course, this vulnerability to health impact is actually being aggravated by socio-economic factors. We heard about the driver, the former resource person mentioning about the impacts they are now experiencing. It's not only on their health but even in their economic capability.

And the next slide. This actually shows the vulnerable sector of the population to impacts of climate change on human health. We can see that the extremes of age are highly vulnerable, the very young and the very old. Even those communities that are located in slum areas and in coastal areas are highly vulnerable. And, if you look at the Philippines, a large proportion of our population are located in these areas. At this point, I would just like to mention that, as far as vulnerability is concerned, our country is highly vulnerable to the impacts of climate change, especially on health.

Next slide please. This is also the definition of adaptation as defined by the World Health Organization. And, in the earlier discussion, there was a discussion on adaptation and mitigation. Actually, we need not only local mitigation but most importantly, global mitigation in order to arrest the impact of climate change not only on the environment but especially on health.

In the Philippines right now, what is really important is adaptation. Although mitigation is important, when it comes to the impact of climate change, adaptation is very important because this is now the present situation where we really have to adapt. Otherwise, there will be a very significant impact on human health.

Next slide please. This is just one framework, as developed by the World Health Organization showing the different determinants of health and how climate change will impact on these determinants. So, earlier, we learned about the impacts on coral bleaching and also acidification of the sea that's part of the biodiversity. I would just like to mention in this slide, we can discuss this thoroughly, but I just would like to call your attention on the arrow. If you look at the arrow, all impacts of climate change, either on the environment, on freshwater, on land, even on air, all these arrow pinpoints towards the center, which is incidentally human health. I think, there are significant or enough information in the literature showing that indeed climate change is impacting on our health.

On the next slide, this is another framework developed by the World Health Organization showing the different areas where climate change will affect

human health. The last column, the column on the right, is clear. Let me just go through the items there. Basically, there are important areas of concern when it comes to the impact of climate change. First is the temperature-related illness and death. Earlier Mr. Cruz mentioned that they're experiencing heat as they drive the vehicle. And one of the characteristics of climate change is not only heat. In fact, according to experts, we are experiencing now extreme weather events. When we talk of extreme weather events, it's either too much heat or on the other side, too much rainfall. And I think Ondoy is one evidence showing that in a short period of time, we can actually experience high intensity of rainfall. And either side, this will have an impact on our health.

Second area is extreme weather-related health effects. Third is air pollution. There are a lot of evidence in the literature showing that the current problem of air pollution, for example, in Metro Manila can actually be aggravated by climate change. And certain air pollutants like ozone and the movement of some primary pollutants will actually be affected by climate change, thereby affecting health. And, of course, another important area is what we call water and food-borne diseases. These diseases are actually developed when people consume contaminated water or even contaminated food. And, of course, it's clear that climate change will affect water quality. One very simple example is flooding. When there is flooding and the source of water in the community are wells that can be submerged by flood, water quality will be compromised. Next is vector-borne and water-borne diseases. There are also studies showing that vector-borne diseases like dengue, malaria, chikungunya, and zika virus are actually transmitted by vector, which is the mosquito. And, the proliferation of these vectors will be aggravated by climate change. Also, next is the effect of water shortage—we mentioned that. Finally, the effect of population displacement. Because of climate change, now, we have disasters. One of the most recent examples is in Albay—although it's not really very much related to climate change because it's a volcanic eruption. But because of the displacement of people, they have to congregate in evacuation centers. Therefore, because the situation is not normal, they don't have the normal amenities of having access to safe water. They don't have proper waste management, septic disposal. The normal problem in evacuation centers is that, after two (2) or three (3) weeks, the problem now becomes a public health problem. They start developing diarrhea, if this facility's water and sanitation facilities, and even vector control, are not in place.

Next slide please. This is just data from the Center for Research of the Epidemiology of Disasters. As you can see, the top cause in Asia is either drought or flood. It is a manifestation of climate change, reckoning from one (1) of the four (4) major impact of climate change which is extreme weather events. Drought is on one side, too much heat and less rainfall, and on the other side is too much rain. This thing happened in one country actually. In

some areas of the world, there are areas where there is drought, at the same time that other areas are experiencing flood. So that's the top two (2).

And the next slide is actually the estimated cost of natural disaster. As you can see, we are actually looking at billions of pesos, in terms of damages. Due to natural disaster just in Asia, you can see there [USD] three hundre fifty-nine billion (359 B) for flood and three hundred fourteen billion (314 B) for earthquake. Although earthquake may not be directly related, but flood, of course, cyclone, tsunami, and others can be related to climate change.

Next slide please. Okay, so mentioning about vector-borne disease, of course, the distribution of vectors will change, arising from increasing temperature. Even the life cycle of the vector, mosquito, will be affected. And, because of these changes in the host, vector population will also change. According to experts, those areas that don't have previously these endemic diseases could probably acquire these diseases because of the change in vector density, vector movement, and vector population.

Next slide. This is just one slide showing the correlation of rainfall with dengue. You can see there, the bar graph. That's the graph, vertical lines, this is actually the rainfall data, over the years. And the other data that I would like to call your attention on is the line. You can see there the line that actually shows the cases of dengue in the Philippines from 1990 to 1999. So, it's very clear, as shown in the graph, that this is highly correlated. As we experience more rainfall, if you can see the peak there, it's also followed by the line showing the cases of dengue in the Philippines. This is one proof showing that, indeed, our health is affected by climate change.

Next slide please. And, of course, food security is also affected. On the next slide and the following slide, I would like to mention that climate change may increase the proliferation of bacterial pathogens including salmonella, campylobacter, and listeria. They may also increase mycotoxin and aflatoxin in seafood. Because of changes in temperature, the pathogenic organism causing food-related illness may also be affected or aggravated.

Next slide. Finally, I'm sorry for this slide. This is not very clear but this will more or less summarize the different impact of climate change to human health. So, may I refer you to the handout? Actually, if you look at the center and then on the next, what do you call that—on the next circle, you can see there are four (4) themes. On red is the rising temperature. And rising temperature will affect the population like heat-related illness and death, even cardiovascular failure, heat stress, and even heatstroke. So, by just increasing the temperature, we might experience problems related to health. And then,

on the next part, of the second circle, it's color green. That's more extreme weather. I mentioned this earlier—the extreme weather events; it's either too much rainfall or too much heat. Diseases that can be aggravated are the following: vector-borne disease like malaria, dengue, and other diseases. And on the blue one, that's the rising sea level. This was discussed exhaustively by our former resource person mentioning a lot of impact on the environment. But, as shown in one of the framework, when the environment is affected, when the food is affected, when the water quality is affected, all these things will redound to health impact. And, finally, on the yellow side, it shows there increasing carbon dioxide (CO_2) level. Problems related to that would be malnutrition and diarrheal disease. Again, when food security, food safety, are compromised, it will lead to malnutrition and malnutrition will lead to a lot of health effects—actually, it's a risk factor. Malnutrition is risk factor to most communicable disease. If a child is malnourished, that child is more prone to many kinds of communicable and even non-communicable diseases.

So finally, I would like to end this short presentation by again quoting no less than the Director General of the WHO. She said that, "The evidence is overwhelming, climate change endangers human health. Solutions exist and we need to act decisively to change this trajectory." I would like to say that we have to act now. Otherwise, the consequence might be irreversible in the future. Thank you very much.

ATTY. MAYO-ANDA:

Thank you very much Doctor Molina. Your Honors, please, may I ask additional questions?

PANEL CHAIR CADIZ:

Please, go ahead.

ATTY. MAYO-ANDA:

Okay. You mentioned about literature, Doctor Molina, on the impacts of climate change on public health. Are you aware of any studies that actually look into the Philippine situation?

DR. MOLINA:

Yes, actually, in other countries, they have a lot of researches and published articles. But in the Philippines, incidentally, we don't have enough, or so much study, but I came across one publication. The title of the publication is "Impact of Climate Change on Human Health in the Philippines." This was published, by Acta Medica Philippina in 2016 and the author is Doctor Jinky Lu from the Institute of Health Policy and Development Studies, National Institute of Health, UP Manila. It's available online, so you can access that study.

ATTY. MAYO-ANDA:

May we know the gist of that specific study?

DR. MOLINA:

It's actually a list of the different impacts of climate change on human health across the country impacting on the different types of disease, vector-borne diseases like malaria, dengue, and cysto and also water-related diseases like diarrhea, cholera, and typhoid fever and other flood-related diseases like leptospirosis.

ATTY. MAYO-ANDA:

My next question, Doctor Molina, is: I saw the slide stating that solutions exist, do you see that also happening here in the Philippines? Do we have solutions to address the impact of climate change on health?

DR. MOLINA:

Ah, yes, actually, I think the Department of Health should lead different sectors in terms of coming up with solutions to the health impact of climate change because we all know that health is multifactorial. Our health is affected by many factors in the environment. And I believe that the health sector alone cannot do this. The health sector should really be supported by, for example, by the water sector, by the solid waste sector, because all of these things are

interrelated and all these things are what we call determinants of health. And on the national scale, I think that DOH should lead this program. But I also would like to mention the importance of the participation of the local government because actually the action happens not in the national level but in the rural areas—the coastal community, the drivers, the farmers, the fishermen. So, I would like to mention that the role of mayors, barangay captains, should actually be part of the solution. Otherwise, the national government can only do so much.

ATTY. MAYO-ANDA:

Your Honor, please, I have completed my questions to the witness, unless the Honorable Commissioners have questions.

PANEL CHAIR CADIZ:

Not really a question: before that, the witness referred to two (2) documents that he came across. I would just like to ask the counsels if you're planning to present these documents before the Commission as part of your exhibits?

ATTY. MAYO-ANDA:

Yes, Your Honor. Thank you for that point. We will submit next time.

PANEL CHAIR CADIZ:

Alright.

ATTY. MAYO-ANDA:

Before the next hearing, Your Honor, because it's good that Doctor Molina mentioned these studies.

PANEL CHAIR CADIZ:

Alright.

ATTY. MAYO-ANDA:

Yes, we will.

PANEL CHAIR CADIZ:

Thank you very much. So we will expect that from you.

ATTY. MAYO-ANDA:

Yes.

PANEL CHAIR CADIZ:

Do the Panel members wish to… questions of the resource person? Okay, we would request Doctor Molina to make himself available for further questioning by the Panel at a later date. Would that be alright, Doctor Molina?

DR. MOLINA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Alright. Thank you very much. So thank you.

ATTY. MAYO-ANDA:

May we ask him to be excused, Your Honor?

PANEL CHAIR CADIZ:

Okay. We are now excusing you, Doctor Molina. And we may now listen to your next witness.

ATTY. PAUDAC:

Good morning, Your Honors. Your Honors, we will be presenting our last witness for today. She flew all the way from Washington D.C. May we call on Ms. Lisa Anne Hamilton?

PANEL CHAIR CADIZ:

Please swear in the witness.

CHR LEGAL:

Kindly raise your right hand please. Do you solemnly swear to tell the truth, the whole truth, and nothing but the truth in this National Inquiry under penalties provided by the law?

MS. HAMILTON:

I do.

ATTY. PAUDAC:

Your Honors, Ms. Lisa Anne Hamilton is currently the Director of Climate and Energy Program at the Center for International Environmental Law or CIEL. She led CIEL's efforts to use the power of law to accelerate the transition away from fossil fuels, strengthen human rights in climate governance, and empower communities to assert and protect their own rights in the face of climate change.

Prior to joining CIEL, she was a Regulatory Consultant whose work focused on leveraging the power of finance and security laws to highlight climate risks and challenge investments in fossil fuel infrastructure. For over a decade, she also served as a Board Member and Membership Chair of Environmental Advocates of New York. Ms. Hamilton received her Bachelor of Arts, College of Arts and Sciences at the Cornell University and her Juris Doctor with honors at the Howard University School of Law. Your Honors, may we be allowed to ask preliminary questions?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

Before that, Your Honors, Ms. Lisa Anne Hamilton is being offered for today to share the summary of CIEL's "Smoke and Fumes" paper, specifically on what the industry knew about climate science, when they knew it, and what they did with the information. Yes, that "Smoke and Fumes" document was previously marked as Exhibit K during the preliminary conference held on December 11, Your Honors. Now, Your Honors, we will proceed with the identification of the documents. Ms. Hamilton, good morning.

MS. HAMILTON:

Good morning.

ATTY. PAUDAC:

We do have here a "Profile and Statement of Lisa Anne Hamilton, J.D." consisting of ten (10) pages. Please kindly go over it, and kindly tell us if you do recognize this document.

MS. HAMILTON:

I do.

ATTY. PAUDAC:

On the last page of the document, page eleven (11), there appears a signature "Lisa Anne Hamilton, J.D." signed March 28, 2018 but previously signed as an e-signature.

MS. HAMILTON:

That is correct.

ATTY. PAUDAC:

Yes. Can you please go over it and confirm whose signature is this?

MS. HAMILTON:

I confirm that this is my signature.

ATTY. PAUDAC:

Do you confirm and affirm the statements mentioned in this document?

MS. HAMILTON:

I do.

ATTY. PAUDAC:

Your Honor, may we request that this document be marked as our Exhibit KK series?

PANEL CHAIR CADIZ:

Attorney Esguerra, please mark as requested. So how many pages again? Eleven?

ATTY. PAUDAC:

Eleven (11) pages.

PANEL CHAIR CADIZ:

Okay, the last page being KK-10 and the signature therein as KK-10-A.

ATTY. PAUDAC:

In your statement, you also attached your curriculum vitae consisting of three (3) pages. Please kindly go over it and tell us if you recognize the document.

MS. HAMILTON:

I do.

ATTY. PAUDAC:

Do you confirm and affirm the contents of that curriculum vitae?

MS. HAMILTON:

Yes, I do.

ATTY. PAUDAC:

Thank you. Your Honors, may we request that this curriculum vitae of Lisa Anne Hamilton be marked as our Exhibit LL, consisting of three (3) pages?

PANEL CHAIR CADIZ:

Please have the document marked accordingly.

ATTY. PAUDAC:

You also mentioned in your statement that you are going to have a PowerPoint presentation, and submitted to us several documents.

MS. HAMILTON:

That is correct.

ATTY. PAUDAC:

I'll be showing you documents. First, the PowerPoint presentation, "Presentation to the Philippines' Commission on Human Rights by Lisa Anne Hamilton" with several attachments. First is the Exxon Research and Energy Company, a document. The PowerPoint presentation consists of eight (8) pages. Please kindly go over it. And the first attachment to the PowerPoint presentation, Exxon Research and Engineering company, a document which contains four (4) pages. Kindly please go over it.

PANEL CHAIR CADIZ:

Counsel, may I see that first attachment? How does it look like… I'm looking for it here.

ATTY. PAUDAC:

The title is "Exxon Research and Engineering Company, Corporate Research Science Laboratories" consisting of four (4) pages.

PANEL CHAIR CADIZ:

Alright. Thank you.

ATTY. PAUDAC:

The second attachment to the PowerPoint is an inter-office correspondence to John W. Harrison from Henry Shaw consisting of seven (7) pages. Kindly please go over it.

The third attachment to the PowerPoint presentation is a document entitled "Carbon Dioxide Exchange Between Atmosphere and Ocean and the Question of an Increase of Atmospheric CO_2 During the Past Decades" consisting of eleven (11) pages. Kindly please go over it.

And the final attachment to the PowerPoint presentation is a document entitled "The Climate Deception Dossiers: Internal Fossil Fuel Industry Memos Reveal Decades of Corporate Disinformation" consisting of twenty-nine (29) pages. Please kindly go over it. Thank you.

MS. HAMILTON:

Thank you.

ATTY. PAUDAC:

Do you confirm the submission of these documents and the contents thereof?

MS. HAMILTON:

Yes, I do.

ATTY. PAUDAC:

Your Honors, may we request that this PowerPoint presentation including the attachments, the four (4) attachments, be marked as Exhibit MM series?

PANEL CHAIR CADIZ:

I recommend that the attachments, because there are quite a few, be marked separately.

ATTY. PAUDAC:

Okay, Your Honors.

PANEL CHAIR CADIZ:

The PowerPoint presentation as Exhibit MM series, the first attachment, "Exxon Research", as Exhibit…

ATTY. PAUDAC:

NN.

PANEL CHAIR CADIZ:

NN series. And then the inter-office correspondence, am I correct?

ATTY. PAUDAC:

Yes, Your Honor.

PANEL CHAIR CADIZ:

As OO.

ATTY. PAUDAC:

OO.

PANEL CHAIR CADIZ:

And then the "Carbon Dioxide Exchange"?

ATTY. PAUDAC:

As PP.

PANEL CHAIR CADIZ:

Document PP.

ATTY. PAUDAC:

Series.

PANEL CHAIR CADIZ:

Series.

ATTY. PAUDAC:

And the climate dossiers, Your Honor? As QQ.

PANEL CHAIR CADIZ:

The climate dossier as QQ series.

There are no other attachments; that's the last one?

ATTY. PAUDAC:

Yes, Your Honors.

PANEL CHAIR CADIZ:

Okay. Since they're voluminous, we will just request the clerk to mark the series accordingly… the exhibits, in series accordingly, so as to save time, and we can already proceed to hearing the testimony of Doctor Hamilton.

MS. HAMILTON:

Thank you, Your Honor. Should I go ahead and begin?

ATTY. PAUDAC:

Yes.

MS. HAMILTON:

So, again, my name is Lisa Anne Hamilton. I am the Director of the Climate and Energy program for the Center for International Environmental Law. I'm very honored to be here with you all today and offer what I can to this discussion about climate change, its causes, and the human rights impacts to the Filipino people. As is stated, my primary goal here is to talk about causation and to talk about, number one, why there is compelling evidence as to why the Carbon Majors are responsible for climate change, as well as the resulting human rights impacts both those that are violated, have been violated, and those that have been threatened. I will refer to my PowerPoint presentation as I go forward, and, the voluminous—I apologize—the voluminous documents as attachments will only be really a page or two that I will refer to for purposes of what I hope will add to the record.

To begin, the "Smoke and Fumes" project was undertaken by a number of CIEL staff beginning in April 2016. We initially launched a website and database of documents that had been collected over a number of years that reflected both industry, scientists, a reflection of meeting minutes, reports that develops the story about what the oil and gas industry has known for decades. What we have, as counsel referred to as petitioner's Exhibit K, is the November 2017 report that is called the "Legal and Evidentiary Basis for Holding Big Oil Accountable." And so I just want to recognize that CIEL was not alone in this undertaking; that it was a collaborative effort with the Climate

Investigation Centers, Climate Files, Inside Climate News, Union of Concerned Scientists—we heard from Doctor Peter Frumhoff yesterday—Los Angeles Times, and Columbia School of Journalism, DeSmogBlog, and Corporate Europe Observancy, among others.

Next slide. My hope is that, in my discussion, that I will highlight the legal context for responsibility. These legal principles of responsibility are embedded in common law, they're embedded in international law, and to use this as our lens with which to review the documents that I'll be discussing briefly. And so those elements of legal responsibility include: Was there a reasonable foreseeability of harm and ability to avoid it? Was the person or entity aware of the risk to life or would a reasonable person in a similar circumstance been aware? Was the risk real and substantial? And did the person/entity take reasonable and proportionate steps to prevent loss of life?

So, just to summarize the findings of the "Smoke and Fumes" report, number one, the documents reflect and suggest that the fossil fuel companies had knowledge and expertise to understand both the threat of climate change and the impact that continued production, marketing, and sale of fossil fuel products would have on climate change; that instead of actively warning the public and taking action to prevent the harm, they continued and increased production; and that sale and continued sale of fossil fuels even though they developed a sophisticated scientific and technical research operation in the fields of meteorology, geology, climatology, and hydrology to study the impacts of climate change while simultaneously sowing seeds of doubt and confusion about whether or not climate change existed.

Next slide. The record would lead us to believe that strongly suggests that there has been knowledge about the impacts of climate change since the 1940s. The 1940s offers some of the initial research and analysis about the connection between air pollution and fossil fuels.

Next slide. I want to begin by looking at some of the documents, the attachments, that I've provided—and, again, I'm just going to primarily read them for the record and then select a paragraph or two to illustrate this point about what was known at what particular time in the course of history. Your Honors, the document that I believe is marked PP now as part of the series is a document from 1957. It is from Roger Revelle and Han Suess, and it is called "Carbon Dioxide Exchange Between Atmosphere and Ocean and the Question of an Increase of Atmospheric CO_2 during the Past Decades." This is again 1957.

So, if we go to what I believe is page nineteen (19) in your version, Your Honors, and I'm looking at the paragraph that is describing again the science that was not new—this was already decades worth of science—and a key passage says, "During the next few decades (meaning '57 and forward) combustion of fossil fuels will continue to increase if the fuel and power requirements of our worldwide industrial civilization continue to rise exponentially. And, if these needs are met, only to a limited degree by development of atomic power." It goes on to say, "estimates by the UN (and those were 1955 estimates) indicate that during the first decade of the 21st century, fossil fuel combustion could produce an amount of carbon dioxide (CO_2) equal to twenty percent (20%) of that which we have now." So, this particular document is a particularly interesting document not only for the year with which we're seeing these initial discussions about scientific expertise devoted to and looking at the connection between carbon dioxide (CO_2) and emissions and the impacts on climate.

Let's go to the next slide. As we progressed through the 1950s, we see the rising prominence of the American Petroleum Institute, and this was a US-based industry organization primarily populated by companies that we now consider among the Carbon Majors. Shortly after, the report that I just read was released. There was a formation of what is called the Smoke and Fumes Committee. And internal documents indicate that there would now be an ongoing industry-funded effort to study the proportion of atmospheric carbon as result of fossil fuel origins. Within the next decade, the Stanford Research Institute would report, again, on atmospheric concentrations attributed to fossil fuels increasing. And that increase to fossil fuel combustion can cause melting polar caps, inundation of coastal areas, among other severe environmental impacts.

So, the next slide that I want to take a look at is now we're in the 1970s. And, by this point, we're now seeing industry scientists who have been actively looking at the relationship between continued marketing, sales, production, and burning of fossil fuels and the impact on increased concentrations of atmospheric carbon dioxide (CO_2). So, Exxon scientists James Black and Henry Shaw, in a number of memos, exchanged correspondence of their findings of science. In what I believe is marked as part of the OO series, I'm looking at the second page of that document, and, again, this is part of an inter-office memorandum exchange between Exxon scientists from the 1970s. And the interoffice memo was reflecting on a conference called the "Miami Beach Workshop" that was attended by seventy (70) scientific experts in climatology, ecology, forestry, agriculture, geochemistry, and oceanography. And this study group recommended that there should be research conducted immediately on the following issues: determination of the amount of carbon stored and the rates of fixation and release from major forest types of the

world, verification of the carbon dioxide (CO_2) buffer in ocean water, the measurement of carbon dioxide (CO_2) in atmosphere and on the oceans. Here, again, it's 1977, among the findings that were discussed is about the climatic effects of carbon dioxide (CO_2) release and the impact on energy production. These documents suggest that there was no confusion, no concern, about whether or not fossil fuels were linked to increased concentrations of atmospheric carbon dioxide (CO_2), that it was a matter of scientific consensus over thirty (30) years ago.

Next slide. So, by the time we get to the 1980s, we now have over three (3) decades of substantive scientific knowledge by a number of experts that reflect to the connection between increased concentrations of atmospheric carbon dioxide (CO_2) and the change on the climate. What is interesting is, despite the fact that these issues concerning climate were not well known to the public, they were now being adopted as part of the business strategy for the carbon majors. What I'm going to read now is the excerpt from what is marked as MM, which is another Exxon Research and Engineering document from September 1982. And, among the noted paragraphs, the second paragraph on the first page is the "Over the past several years, a clear scientific consensus has emerged regarding the expected climatic effects of increased atmospheric carbon dioxide (CO_2)." Here again this memo suggests that there was, in fact, not a lack of confusion or information about the impact of increased combustion of fossil fuels.

What's interesting is that, by the 1980s, we also have a phenomena where the Carbon Majors are now incorporating their sophisticated collection of science into their business models so that—next slide—you have Exxon incorporating climate change projections into Arctic operations planning while discounting risk with the public and you have the announcement of Shell Oil that their gas platform in the North Sea would be increased in height to accommodate for sea level rise. Here, again, you have extensive science about the impact of climate change that is being used to further the profit activities of the Carbon Majors.

The last slide I want to get to is what's been marked as part of the Climate Dossier. And, again, yesterday's resource person, Doctor Peter Frumhoff, his organization, Union of Concerned Scientists, pulled together this dossier which I highly recommend revisiting and delving into with some depth because I think, by far, it is a reflection of the amount of money spent on public relations to confuse the public about the impact of climate change and to knowing that such deception would delay the ability to pass any legislation, any regulations that would rein in their activities. For that document, I recommend going to page ten (10), which I believe is PDF page ten (10) that describes the definition of victory in a climate denial effort. So "Victory will

be achieved," and this is American Petroleum Institute's 1998 memo (which) presents a roadmap for climate deception. And "Victory will be achieved," it says, "average citizens understand, recognize uncertainties in climate science, recognition of uncertainties becomes a part of 'conventional wisdom.' Media understand, recognize uncertainties in climate science. Media coverage reflects balance on climate science and the recognition of the validity of conventional wisdom. Industry senior leadership understands uncertainties in climate science. And, lastly, those promoting the Kyoto Treaty on the basis of extant science appear to be out of touch with reality."

Now, bringing this back to questions of legal responsibility, the analysis is fairly straightforward. There are several elements. Next slide. Actually, I'm going back to an earlier slide before I get into state responsibility. But legal responsibility includes—was there reasonable foreseeability of harm and ability to avoid it? The documents—and again these are just a sampling of documents from "Smoke and Fumes"—that suggest that industry experts had knowledge, that they had the ability to avoid it and failed to do so. There's similarly sufficient data to suggest that these entities collectively were aware of the risk of life, that, with the sophistication of scientists involved, they knew about sea level rise, they knew that there'd be changes to agriculture, and they knew that there would be impacts such as access to food, access to water, and general, right to livelihood, among other basic human rights. And there's also this question of whether or not the risk was real and substantial and, again, the global nature of the recommendations from these scientists recognize that the threat of climate was not limited to one particular location, one particular state, that the impact would be global. So, when we discuss what are the responsibilities of the states under international law, under international norms and standards, and this is a question that requires both a substantive and procedural obligation, and those obligations include protecting the rights—I'm sorry, I'll read from the slide—a state's obligation to address environmental harms that interfere with the full enjoyment of human rights, international law requires states to protect persons within their jurisdiction and address human rights abuses as result of conduct by corporate actors.

I think that I'm going to draw my presentation to a close here simply to make time for questions, but I think that, again, there is a tremendous amount of factual data to cull through in terms of connecting the responsibilities of the Carbon Majors to the human rights impacts being suffered by the Filipino people. But there is a good amount of data available in the public domain, some of it is within research universities, some of it is among paywalls. But to connect the knowledge of the impact of the sales of fossil fuels on increased concentrations of atmospheric carbon dioxide (CO_2) that is having extreme weather impacts globally was well-known for decades. And it has

simultaneously been recorded that the amount of efforts that were going to frustrate those efforts.

And I will, just as a last note, I do think it's worth noting that with such a pattern of deception, it is a question before the Commission about whether or not it interfered with your ability to protect the human rights of the Filipino people, where there has been such delay in having access to information that could have possibly saved lives earlier and possibly saved the people from the future suffering that I hope there's still time to avoid. So, thank you. I'll stop there.

ATTY. PAUDAC:

Your Honors, we don't have a question for Ms. Hamilton. If the Honorable Commission does have questions?

PANEL CHAIR CADIZ:

Yes, we do have some questions. Ms. Hamilton, just let me summarize what I thought was one of the major points that you were trying to establish: number one, that as early as several decades ago, the Carbon Majors have been made aware of the potential harm to the environment of their business operations. But the case now before us is not just the environment: we're talking of climate change. And you can make a distinction between environment as a smaller concept against the (concept of) climate change. How do you jump… how do you intend to establish that nexus between climate change and the environmental harm that was made known to them?

MS. HAMILTON:

I'm going to refer you back to the 1982 Exxon Research and Engineering memo. And, just to clarify, you're absolutely right that while the memo does discuss the geological evidence of temperature increases, I think here that there's a statement here that says, "However we find a compensatingly larger temperature increase in the polar regions given global average temperature increase that falls well within the range of scientific consensus." And I do want to emphasize that, not only reflected in the commentary of the letters exchanged between scientists at this time, but even in other documents that

relate to recommendations of who should participate in addressing these issues. They recognized very early on that this is not simply a national issue of concern nor is it even a regional issue of concern that is, in fact, a global issue of concern as a result of changes in climatology and beyond isolated issues of environment.

PANEL CHAIR CADIZ:

The second point that you sought to establish was that, having been made aware of the potential harm to the environment of the business operations of the respondents, they not only failed to act on it, you were… asserting that they even went further. They engaged in acts of deception, to mislead the public on the possible harmful effects of their operations. Could you expound on that?

MS. HAMILTON:

That's correct. Sure, happy to. Referring to Doctor Peter Frumhoff's testimony, and, again, why I believe the slide he referenced in his testimony is worth discussing again here is that this effort to deceive received great investment at the time of the Kyoto Protocol. Kyoto Protocol was an attempt to really take a bold effort of addressing climate. And if you could create enough deception, create enough doubt, create enough cynicism among people who were not convinced that climate was a problem, they would not be on board to do something about it. Not doing something about it meant that, for the oil and gas industry, their market share would be more likely to see profits in the continuing future rather than having those profits eroded by policies and restrictive regulations like the Kyoto Protocol.

PANEL CHAIR CADIZ:

But what I'm interested to find out is: What are the specific acts committed by the so-called Carbon Majors that you might deem as deception?

MS. HAMILTON:

Those documents, I do think, are worth looking into. I don't have them in front of me now, but, from my best recollection, it's everything from advertisements to create doubt. It is lobbying activities or money spent to influence politicians to make decisions that are more in line with the continued production, marketing, and sale of fossil fuels rather than curtailing them. It's also reflected in the number of patents in alternatives for sources of energy that could possibly reduce the demand for their product. By owning those patents, you eliminate the ability to control them and eliminate the ability for anyone else to develop them. So, the efforts to ensure market dominance comes in a lot of different forms and it can be evidenced in a lot of different documents.

PANEL CHAIR CADIZ:

Are you saying that denial of the negative effects on the environment or even on climate by the Carbon Majors of the negative effects of their operations is equivalent to a positive act of deception?

MS. HAMILTON:

And you tell me if I answer your question with my response. The curious thing about your question is that I read your question to mean does their climate denial constitute a positive action and their climate denial was for our benefit, the public. They took advantage of climate denial for their benefit of continuing operations and profits for their companies. So, to the extent that climate denial was something that was an active tool for purposes of the public, not for purposes of their profitability.

PANEL CHAIR CADIZ:

Okay. Thank you. Regarding your study, the report that you issued, "Smoke and Fumes," which you say was informed also by studies made by other institutions, academic and otherwise, was this subjected to peer-review?

MS. HAMILTON:

So the study itself was not subject to traditional peer-review, but the process of developing the archives was to consult experts along the way, to consult individuals who were with the industry, who were familiar with industry trade groups, who understood the relationships between many of the same scientists actually who had been pivotal to the tobacco industry that became scientists for the oil and gas industry to help them make sense of the science of impact of air pollution, impact of fossil fuels, impact of combustion on atmospherics, on human health, so that you know, those links, those connections remain prevalent. Does that answer your question or did I get too far afield?

PANEL CHAIR CADIZ:

Just go ahead. I'm getting some sense…

MS. HAMILTON:

Can you refine your question?

PANEL CHAIR CADIZ:

No, my original question is, so you issued a report, "Smoke and Fumes" report. And this report consisted of the works… not only of your organization, the CIEL, but you mentioned earlier that this also considered studies made by other organizations, members of the media… academic institutions. So, was this report, before it was published or after it was published, peer-reviewed by other organizations… by scientists?

MS. HAMILTON:

As far as I know, the article, the report itself was not peer-reviewed. It did have the benefit of expert input and expert analysis to inform whether or not the conclusions that we reached were fair and reasonable. Unfortunately, I do not have the names of those experts who were consulted but we'd be happy to provide those to you.

PANEL CHAIR CADIZ:

Are you aware of any negative responses or challenges to the findings contained in this report produced by, for example, the oil majors?

MS. HAMILTON:

There are some very supportive members of the industry who do a great deal of social media to, let's just say, poke fun or make fun of the findings. But we find it consistent with an effort to derail efforts to address these issues seriously.

PANEL CHAIR CADIZ:

But were these efforts or arguments also published?

MS. HAMILTON:

They appear on social media.

PANEL CHAIR CADIZ:

Social media, yeah, but they're not in the form of, let's say, a counter… scientific study or anything like that?

MS. HAMILTON:

What we're seeing, and I can only speak to the United States primarily, were in the last years, so we're now seeing nine (9) different climate litigation cases being brought by cities and counties, coastal communities, many of them who are also suffering the very real severe impacts of climate change now. Those

communities are facing billions of dollars of infrastructure cost to harden their sea walls because, as sea level rises, they are now being or dealing with the threat of inundation.

The concern there for them was where there's significant and credible scientific evidence that can attribute what those harms are to them now to the Carbon Majors, that taxpayers in their jurisdiction should not bear the cost of having to pay for these harms that were foreseeable to the Carbon Majors. These cases have been filed, and industry has determined that it is in their best interest to file suit against those communities and charge them with pursuing these actions as political stunt rather than a substantive claim of foreseeable harm.

And I only raise that issue because it is a form of, I will go with it's my opinion to say, it's a form of harassment. It is a form of distracting and failing to take responsibility for harms. And I think it is an example of a trend that, unfortunately, we expect to see more of. I would prefer, and it's unfortunate the chairs, to the left of counsel are empty because at this stage and the seriousness of the problem, it would be more beneficial to have them at the table to work for remedy rather than continue to be absent and engage in denial and other deceptive techniques.

PANEL CHAIR CADIZ:

So, you spoke of remedy. Could you expound on the legal theories by which the Carbon Majors could be held responsible? I think earlier, you mentioned tort and civil liability and some such things. Could you expound on them more?

MS. HAMILTON:

Sure. There are under a number of legal theories, and, again, I focused on issues of tort because they're the most clear-cut, but there are issues of international law, international norms, that require states to protect, respect, and fulfill human rights. The narrative being described where you have private actors as this entity, the series of entities are, they have committed and threatened to continue to commit human rights abuses. We know their activities contribute to climate change significantly, we understand that climate change threatens access to food, access to water, among many other human rights, and that the states like the Philippines have an obligation to

protect its citizens for human rights. It's well established under international law. It's well established in international human rights law that the states have obligations to protect its citizens from human rights and that includes the activities of private actors like the Carbon Majors.

PANEL CHAIR CADIZ:

Are you referring to the UN Guiding Principles on Business and Human Rights by Ruggie?

MS. HAMILTON:

The UN Guiding Principles is a good point of reference. It is not binding but it offers a form of recommendations. I believe my colleagues expounded on this in the joint summary presented to this Commission. It is a set of guiding principles that are informed by the evolution of human rights law about holding private actors accountable and I think that they can and should inform this question of how to hold the corporate majors responsible.

PANEL CHAIR CADIZ:

Would the other Panel members…Commissioner Leah?

COMMISSIONER TANODRA-ARMAMENTO:

May I ask you, as a lawyer, what indicators or evidence will lead us to conclude that, to pinpoint responsibility on the part of the industry and/or the state?

MS. HAMILTON:

I will give my suggestions. Again, my understanding is that on May 27th, the continuing part of this hearing, you will hear from my other colleagues in the legal profession, so I don't profess to be the last word on that. But I think,

again, when it comes to this issue of harm—and you've had a lot of testimonies over the last several days about harm—and I think the benefit of attribution science, like the work of Rick Heede, connects the activities of the Carbon Majors to the outcome—this increase combustion of fossil fuels has led to increased concentration of CO_2 and his methodology can pinpoint the proportion of responsibility based on their market share. Many of these Carbon Majors published data about how many barrels of oil that could be burned, and he was able to take those figures and expound if someone burns a hundred barrels of oil, what is their percentage of CO_2 emissions. And so this data and methodology breaks down, based on market share, who those largest producers are and what their contributions to climate change are.

I do believe that the attribution science and in-depth detail about the contributions to make the causal link between activities and harm would be particularly helpful. I think also, again, diving into the documents—the documents I took and described are footnoted in the "Smoke and Fumes" legal and evidentiary document. Those documents, I believe, are helpful in determining awareness: Was this harm foreseeable? Was there an awareness by the Carbon Majors that their activities would lead to harm? So those—I will stop there, but I do believe that those in particular may be helpful in this Commission's deliberations.

PANEL CHAIR CADIZ:

I have a follow-up question to that. You mentioned Doctor Richard Heede.

MS. HAMILTON:

Yes.

PANEL CHAIR CADIZ:

Heede's work, what is the title of this work?

MS. HAMILTON:

I always refer to him as Doctor Heede's work, so I can find that for you.

PANEL CHAIR CADIZ:

Can counsels now give us the title of this work?

ATTY. SORIANO:

We referred also to Mr. Heede's reports. It's actually a set of documents, but collectively we call it 'The Carbon Majors Study'.

PANEL CHAIR CADIZ:

The Carbon Majors Study…you said "collectively;" so this consists of several reports?

ATTY. SORIANO:

At least, four (4), Your Honors. And, if I may read them, the first one is on updated details of Carbon Major publications, the second one is a press release on the update of Carbon Majors project, third one is actually the first and original study entitled "Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers 1854-2010", and the fourth one is a reference to how the study was reviewed and developed and it is entitled "Carbon Majors: Accounting for Carbon and Methane Emissions 1854-2010 Methods and Results Report".

PANEL CHAIR CADIZ:

So, basically, if I may summarize, it's a report, findings of his report, and the methodology that was used in coming out with the conclusions. Am I correct?

ATTY. SORIANO:

That's correct, Your Honor. One original study, the next one a description of the methods employed in the study, the third one is a press release about it, and the last one an update about the report.

PANEL CHAIR CADIZ:

And this was the report that was, yesterday, referred to or cited by Doctor Frumhoff?

ATTY. SORIANO:

The same document, Your Honor.

PANEL CHAIR CADIZ:

So, my question now is: this study by Doctor Heede, was this subjected to peer-review to other scientists as well? Was it published in a scientific journal?

MS. HAMILTON:

I believe so, yes. I'm going to say yes. I'd be very surprised if it wasn't, simply because people would not rely on it to the extent they have if it was not is my sense.

PANEL CHAIR CADIZ:

We would request that, at a later date, we be informed of the name of the journal where this study made by Doctor Richard Heede was published.

ATTY. SORIANO:

Your Honor, if we may manifest and clarify, we did inform the Honorable Commission that we will be presenting Mr. Rick Heede in one of the public hearings and included in his presentation we did request to explain how the publications were peer-reviewed, the importance of peer-review, et cetera.

PANEL CHAIR CADIZ:

So, we will be looking forward to that. As of now, I have no other questions.

CHAIR GASCON:

Thank you, Mr. Chair. First of all, Ms. Hamilton, I want to thank you for time and effort coming over all the way to the Philippines to appear with us personally. We appreciate your commitment to this issue and we are greatly encouraged by your thoughtfulness in giving us appropriate information that will help this Commission address this issue squarely. I am grateful for your presentation although I do need to ask some questions, some of which have already been raised, by my other colleagues. But I'm interested in trying to understand in the context of this proceeding is how we might move from an acknowledgment that Carbon Majors contribute to impacting on the environment, on one hand—because that can fairly be explained by the science and so on—how that activity would then be linked to the possibility that a human rights violation had occurred. Because we are, after all, a Commission on Human Rights, and so we are keen in understanding whether, in this particular instance, two things: whether a human rights violation as such has occurred, that there are identifiable victims of those violations, and that the perpetrators are those that the petitioners claim to be accountable or liable for it. And, in this instance, they have impleaded the Carbon Majors. That's what I hope to try and see a sort of like a causal connection to. Ultimately our work will have to involve identifying that causal link between the activities on one hand and the harm caused.

However, in the context of the environment, we have what is referred to as, essentially, the tragedy of the commons. We all know that the environment is being polluted. Everyone is making a contribution to that. It may be the Carbon Majors but it may be all of us right now because we're using air conditioning and so on. So, we're all contributing to the pollution in the air,

carbon dioxide emissions. How might I be confident in saying that these particular Carbon Majors, because of the X amount of contributions that they make, should be the ones that we should identify as the perpetrators of a human rights violation? Or should we instead—and you've highlighted this anyway in your presentation—say that the violators, if assuming there is a human rights violation, are the states because of failure to protect; the withdrawal from the Kyoto Protocol of the Trump administration or the failure of the Philippine government to raise these issues when they could have and should have and so on. That's what I'm grappling with. What tools are available for me to have the confidence that, yes, those that have been impleaded in this instance are the ones that should be held liable for specific harm? How can I link the testimonies of the fisherfolk and the farmers yesterday or perhaps later when they present victims of Typhoon Haiyan or the driver this morning, how can I link the harm that they experienced to the actions of Exxon or BP and so on?

MS. HAMILTON:

That's a good question. I'm going to do with my very best to answer it bit by bit, part by part. Number one, what I would say and I want to start with the obligation of the states. It's very difficult to hold the states accountable in my opinion where you do not have access for information to help you do it. That is one of the functions of climate denial, to tie the hands of regulators to get them to act because getting them to act means that the profitability of the existing business activities could not occur. So I will start with, yes, while states do have an obligation to protect human rights, it's very difficult to do so when you do not have information. So, starting with information, I would say to follow the science. The reason why climate litigation is taking off globally is because of the sophistication of the science now that can attribute particular conduct and activities with actual harm. And, I have to confess, I believe—and, again, this is my opinion—that this idea of blaming the consumer is consistent with climate denial because, again, it distracts and it is an effort to diffuse where the real source of the problem is. You have an industry that made billions of dollars over decades and had the sophistication and resources to employ scientists to study atmospherics, to study meteorology, to study oceanography, to look at the ways in which their activities were contributing to ocean acidification that leads to coral bleaching, that leads to difficulties in access to water, which is a basic human right. Follow the science. I think the science can tell us an awful lot now that it didn't in prior times.

I also was, rather moved by—was it Doctor Gutman yesterday? the woman who was showing us the graphics on increased temperature rises?—Guzman! Thank you. Increased temperature rises over time. I think again, what the

science tells us is that the global temperatures are accelerating in a way. And again, science tells us, that is directly attributed to man-made anthropogenic CO_2 concentrations. There is a consensus in the science, it is not up to debate. Those who want to debate tend to want to, to diffuse the issue and deny. I would say that the science tells us who's responsible, they tell us what the impacts are, and increased severity of hurricanes are directly attributed to increase in temperatures.

And, you know, if you're looking for your human rights violation, I think the seven thousand (7,000) victims of Typhoon Yolanda are a good place to start. I believe that the four million (4 M) people who were displaced as a result of that weather event are a good place to start and their depravation of food and water and livelihood as a result of that event. In the United States in our recent season of catastrophic hurricanes, Harvey, Irma, and Marie, and many of the people of Puerto Rico who still do not have access to food, water, and electricity, the issue wasn't whether or not it was simply a cluster of hurricanes, it was that increased warming of the ocean temperatures aggravated, created such a degree of aggravation that people were harmed. Again, I'm not a climatologist, I can only look to the law to assist me in drawing the causal links between activities and outcomes and I am encouraged that Rick Heede is coming to further elaborate on that.

CHAIR GASCON:

Neither am I a climatologist, I too am grappling with this issue as a lawyer. But you know, that's why I referred to the tragedy of the commons because you have this general attribution but, if we are to hold people ultimately to account, and there is of course a principle in international environmental law that says polluter pays—but what do you make the polluter pay for? Do you make the polluter pay for polluting the environment? And there are already mechanisms for that in place. Or are we also saying now that we will also ask them not only to pay for the pollution of the environment *per se* but also for a specific harm caused to a specific person in a given period of time? And how do we then allocate the burden? I mean, if there are, what, forty-seven Carbon Majors, X contributes ten percent (10%), Y contributes eight percent (8%), and so on, how do you do that? How do we actually get the specific corporations to pay? Or maybe the better mechanism should be States, you know. States will have to press on these individual polluters. But then, how can the Philippine government then make a demand on Exxon or BP or Gazprom, whatever, for the specific damage on the seven thousand (7,000) victims of Haiyan that you referred to? I'm trying to find legal justification or basis to do that. So both how the justification and the mechanism by which

we can—although I already said yesterday, we are not going to, award penalties or make decisions of accountability as such—but, ultimately, our report will have to guide policymakers, our government, perhaps other stakeholders about what the next steps might be and so if there's any way by which you can help us, based on your knowledge of the current state of international human rights and environmental law, to understand this, then we'd appreciate it.

MS. HAMILTON:

The one thing I will say to that, again, I think that there are some experts in remedy who would be far better positioned to assist you and process them myself. But what I will say is that, I've been very fortunate to work with a number of different communities globally on this issue of climate impacts. And there are certain things that cannot be replaced ever. You can't replace someone's mother or child or the promise of a family. And, in the same way, from an environmental perspective, speaking to colleagues who work on Continental Africa, and you cannot replace the disappearance of Chad. It's impossible. There's no amount of money that's going to replace to what was a God to communities around that lake. There's no replacing it. This is an unprecedented global problem that is going to require a number, no one solution is going to be sufficient. I believe that we are best positioned if we utilize as many options and as many parties and as many participants to help at the problem from a number of different angles. I'll stop there.

CHAIR GASCON:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Gwen will be fielding some questions to the witness.

COMM. PIMENTEL-GANA:

Good morning!

MS. HAMILTON:

Good morning.

COMM. PIMENTEL-GANA:

Thank you for that expert, afternoon *na ba*? (is it afternoon, already?)

MS. HAMILTON:

Good afternoon, yes.

COMM. PIMENTEL-GANA:

Okay. Anyway, you did mention about this climate deception that has been foisted on the public for like decades already, so I just want to know if when you say deception, was the deception a concerted action of the Carbon Majors? Could you qualify it as a conspiracy? Would the State have been involved in such, knowledge, of this deception that was foisted on the public?

MS. HAMILTON:

I think that it is a very important question to be sufficiently answered by the Commission. What I can tell you about the work that CIEL did with "Smoke and Fumes" is that there's an inference that following the money may be helpful in determining who was responsible for what [and] when. That's not information I have on me at this point in time, but the document that I refer to that is in the climate deception dossiers, those documents I think will be helpful in answering that question.

COMM. PIMENTEL-GANA:

Okay. Thank you.

PANEL CHAIR CADIZ:

Commissioner Karen?

COMM. GOMEZ-DUMPIT:

Thank you. Just following up on the question of the chair and somewhat Commissioner Gwen's. You mentioned earlier that states had the obligation but it was difficult for them because of the lack of information available.

MS. HAMILTON:

That's my opinion, yes.

COMM. GOMEZ-DUMPIT:

Yes, but don't you think that states ought to have had searched for the information themselves given that they are indeed regulating these Carbon Majors?

MS. HAMILTON:

That's an interesting question about where does state obligation begin and at what point in time does it begin. That's a very difficult question that I don't know that I have an answer for. What I can say is that I think that where there is a scientific consensus and it is no longer in dispute, that climate change is real, it's happening now, and it's impacting all of us globally, and my hope is that where there is doubt, the Paris Agreement as a 2015 benchmark, as being a measure from a state perspective—not necessarily a court perspective, but a state perspective—about what you know to be true. When you have a global

climate treaty where practically every country in the world signed it to make a commitment to something that is tangible, I think that's a pretty good indication… states now responsibility is a clear benchmark.

COMM. GOMEZ-DUMPIT:

Just one. Of course, states would have specific departments that will take a look at the scientific evidence or even generate the scientific evidence. Don't you think that, even as far back as 1950s when you started your presentation earlier, don't you think that at that time even states actually had the resources to employ scientists to inquire on this particular phenomenon that's happening today?

MS. HAMILTON:

Again, this is my opinion and there're others who may differ. I am struck by the acceleration of extreme weather events. It's been interesting to see the increased frequency and intensity within just the last ten (10) years. Although there may have been, you know, probably most states have some periodic weather, and monitoring of their own changes in everything from hydrology, geography. It is the intensity and the, you know, we often say in the US, it's the hundred year storm that is happening now every year. That is a recent phenomenon. And I think that just the severity and intensity and frequency—those characteristics are part of the cumulative effects of climate change that I don't know that any state monitoring would have necessarily captured. But even if it did capture it, it doesn't have the benefit of attribution science, which really can pinpoint the proportion of certain activities to this new normal of extreme weather events.

PANEL CHAIR CADIZ:

Can I have two more follow-up questions? As a legal expert of CIEL, I presume that you're aware of the efforts being made by all the victims in seeking remedy for alleged violations resulting from climate change. Could you give us a quick overview of how these victims are utilizing… because this will be part of our recommendation and, actually, we've been grappling with this issue also… utilizing state-based judicial and non-judicial mechanisms, and the efforts that are happening around the globe exploring these two avenues in addressing climate change issues?

Particularly, I would be interested in hearing from you on the status of that interesting case filed by New York City against the Carbon Majors.

MS. HAMILTON:

Right. I will start there simply cause that case was filed very recently and is, again, an example of, by virtue, the benefit of attribution science. There is enough evidence to create a causal link between the conduct of Carbon Majors and the harms that New York City suffered during the course of Super Storm Sandy, resulting in billions of dollars of damages. So this causal connection between actors, activities, harm, and damages provides a particularly compelling case. What's going to be interesting to see in the US is under what legal theory claims will prevail, whether it's under state law or sort of larger federal laws, of common law of nuisance. Again, there is an evolving jurisprudence about scope of responsibility, scope of liability, where the appropriate remedies, how you define harm. I think there's also an interesting sort of development of actual harm between prospective harm and being, showing due care about harms actually in, and presently suffered versus those that may be too far off in the future to address. As far as the sort of non-judicial remedies, this part I'm not quite clear. I'm not better versed in actually the cases themselves and how they're evolving.

PANEL CHAIR CADIZ:

You're now before a non-state-based, non-judicial…

MS. HAMILTON:

I see, whether there are other national human rights institutions that will be looking at these issues, I think that there's a lot of people who're looking to see how you will decide. It is a huge responsibility and you are truly setting precedent here. I think that the law of international human rights is clear. I think you have the benefit of science like no other human rights institution has had prior to address the issues of climate change. My hope is that it will send a signal about the need to address this issue in a way that isn't just rearranging chairs on the Titanic because, as someone referred to it, is that it becomes a

much more deliberate, concerted effort to protect the rights of people who are currently standing in harm's way.

PANEL CHAIR CADIZ:

But what I wanted to hear from you is: Could you give us, more or less, an assessment of how global efforts are proceeding in regard to availing of state-based judicial and non-judicial remedies? For example, in so far as judicial remedies are concerned, would you say that there is an established trend or legal precedents that are, more or less, developing into a global precedent that… we can cite as a Commission?

MS. HAMILTON:

I do think that the recent decision by an American court on human rights was very compelling. I think that you will see more decisions that recognize a fundamental right, whether you put it as a survivable climate, a livable climate, whether on behalf of present generations or future generations, the law, the jurisprudence on this is evolving rapidly, as well as the discussions among a number of human rights, treaty bodies. We're seeing a number of decisions that have come out of, CEDAW, the Committee on the Rights of the Child, particularly looking at the state's obligations in line with their energy policies and looking at ways in which, if you are endorsing an energy policy that exacerbates the risk of climate change and the risk of human rights, you are not meeting your obligation under certain international conventions. It is rapidly evolving on the state level. It is rapidly evolving on the international level. And it just remains to be seen under which arguments, which set of facts, will be most compelling to allow for remedy.

PANEL CHAIR CADIZ:

Are there other questions? Counsel?

ATTY. SORIANO:

Your Honors, may we just manifest and this is in relation to some of the questions that were raised by his Honorable Chair, we will be presenting expert resource persons in the next public hearings, specifically discuss examples of proxy measure of responsibility, which I believe that's the two that's being asked. And that proxy measure of responsibility will be building on Mr. Rick Heede's Carbon Majors study. So that will be elaborated in the next public hearings.

The second point is a request to discuss any formula available to measure that responsibility. One of those formula has actually been mentioned here like market share and some formula and approaches to measure responsibility, given the unique nature of an environmental problem, and the health problem, for example, in the opening statement, I mentioned this—the tobacco cases. We can also draw examples from the tobacco cases, how the impacts were measured, and we will have another resource person to elaborate that, example and that approach, several approaches to measuring impacts and responsibility.

And the last point is that, in our Petition, in the Amended Petition, we did mention that, while it is not possible to attribute a specific harm or threat thereof to the carbon produced by a single Carbon Major, there is a substantial probability that the climate impacts experienced by Filipinos are made significantly worse as a result of the Carbon Majors' past and current activities. Each company should be made accountable for making some of their contributions. And an expert resource person will be invited again to explain that responsibility is not contingent on a company being the sole cause of a human rights impact. A company is responsible if it has contributed to, or is involved in the impacts, even it is one among many responsible parties. We will be presenting a resource person to elaborate that statement, Your Honors.

PANEL CHAIR CADIZ:

So, these resource persons that you mentioned… because those are two basic issues you mentioned… will all be addressed in the next hearing in May?

ATTY. SORIANO:

Hopefully, Your Honors, they will be in person this May. But, likely, one or two may not be available so we will be presenting them in the hearings after.

PANEL CHAIR CADIZ:

After May.

ATTY. SORIANO:

May.

PANEL CHAIR CADIZ:

Alright. Attorney Mayo-Anda?

ATTY. SORIANO:

And the last point, Your Honor, just for the record that when you asked earlier which publication published Mr. Rick Heede's report, it's in the scientific journal named *Climatic Change*. It's dated January 2014, volume 122, issue 1-2. And it's on pages 229 to 247 or we will verify that. Maybe we'll clarify that.

PANEL CHAIR CADIZ:

Would you be able to furnish us copies of that journal?

ATTY. SORIANO:

We will do so, Your Honors.

PANEL CHAIR CADIZ:

So we could review it before Richard Heede actually testifies before the panel.

ATTY. SORIANO:

That's noted, Your Honor.

PANEL CHAIR CADIZ:

Are there other questions, Chair?

CHAIR GASCON:

Mr. Chair, actually this isn't actually a question directed to our expert witness or to the lawyers for the Petitioners at this point. It's really more a question of order or procedure that might guide us both now and in succeeding hearings, Mr. Chair. I would like to seek clarification if our rules will allow or does allow the prospect or possibility for questions to be tabled not from the panel nor from the lawyers but, let's say, from the other stakeholders that are here or perhaps watching. I asked that question because, of course, this is a non-adversarial proceeding. Second, we have made a decision that this should be an open, transparent, and inclusive process as best we can, but, of course, the constraints of our procedures—we have a witness stand, we have lawyers, being very formal about things, but the fact that we have no lawyers from the Respondent but potentially some of them are observers but not making an appearance as such, shouldn't we create the prospect or possibility for interlocutors to raise questions, maybe under certain rules, restrictions so that, at least, we could exhaust the possibilities of discussion. I don't know if the rules allow this and you are in a better position to.

PANEL CHAIR CADIZ:

The rules definitely allow it. In fact, we make it a point to mention every time we have a hearing, starting from December during the preliminary conference.

And, in fact, before we end the hearings, we always address the gallery if there are other parties present in the session hall who would want to manifest any question, or make suggestions to the Commission. So, anyway, I would reiterate that and, perhaps, what the Chair is suggesting is if we could have a concrete mechanism or procedure whereby we could gather formally these questions. We can talk about that, Mr. Chair, but certainly we are open to receiving questions from the gallery that we can ask to the witnesses.

COMM. GOMEZ-DUMPIT:

What about questions from social media? Is that possible?

PANEL CHAIR CADIZ:

It's possible… questions from outside, the lawyers, and the Panel... We are ready to receive these questions. In fact, one of the protocols that we were trying to develop… I don't know if it's already done, that's why we're also being streamed online… is to encourage those who are observing the proceedings to participate, to field in their questions and comments. And all these, as far as practicable, if we can forward them to the witnesses, we will do so. But all these, we will consider not only questions but even responses from third parties, when we do draft the resolution.

CHAIR GASCON:

Thank you, Mr. Chair. And that last point is very, important as well. While we have continued to offer an opportunity for any of the Respondents to come forward and while they have not yet acknowledged or responded to that invitation in this hearing, we of course note that some of them have already submitted written pleadings and communications to the Commission. It's a good thing that you also say that, even at the end of this whole process, even prior to making a report, we will continue to allow the opportunity to be provided to any interlocutor to present whatever they feel will be useful for us as we prepare the report.

PANEL CHAIR CADIZ:

And just to add, Mr. Chair has observed that the Respondents are not here. We have made the decision to reach out to experts, other witnesses that would tend to dispute the evidence of the Petitioners, and we do intend to invite them, and that is the major reason, in fact, why we are conducting hearings outside of Manila - in New York and in London, because we do want to give the Respondents who are based outside Manila… the opportunity to participate in our proceedings.

Yes, and as Commissioner Pimentel-Gana is reminding me now, I reiterate the invitation to the Respondents, whether their lawyers are inside the room or observing elsewhere, to consider participating in this dialogic process. So, are there any further questions from the panel?

Okay, Commissioner Karen.

COMM. GOMEZ-DUMPIT:

Just a basic question that I wanted to ask earlier on. I'm sorry, I'm going to go back to the documents that were presented, particularly the inter-office correspondence and this particular letter. Have these documents been acknowledged by the Carbon Majors, for instance, Exxon, to your knowledge, or has this been refuted, or the authenticity assailed?

MS. HAMILTON:

To the best of my knowledge, it has neither been addressed by them, but it's what I believe is an archive from a former employee. But I would, again, have to check with the staff to confirm the source.

COMM. GOMEZ-DUMPIT:

Thank you for that.

PANEL CHAIR CADIZ:

Are there other questions? Oh, there, Mr. Isagani Serrano is one of the petitioners, So could you…

MR. SERRANO:

I was just struck by the last point you made, Mr. Chair.

PANEL CHAIR CADIZ:

Before you continue, could you state your name and the organization you represent?

MR. SERRANO:

Isagani Serrano, I'm the president of the Philippine Rural Reconstruction Movement and one of the Petitioners. I would like to ask the Chair about the last point you made in regard to calling on certain witnesses who are on the opposite side of this debate or dialogue, if you will.

I want to know if the Commission, one, will be inviting this bunch of climate deniers among the scientists, for example, Fred Singer, or the statistician McIntyre, and these people who have been involved in the science of climate change, just to mention some of the examples. Second, where will that put the Commission because you will be taking two (2) groups who would be battling or debating on the science of it or repeating some of debates that have already gone through in the climate circle, and, as the Chair said, you're not in a position. The Commission itself is not in a position to be able to make a judgment on the science of these things, so where will that place you if that happens? It's just a question and comment on the point that you made.

PANEL CHAIR CADIZ:

This is no different from having the Respondents appear. Hypothetically, if the Respondents had appeared, then we will be hearing the other side of the

issue, so to speak. But their non-appearance should not prevent us from listening to the other side to have a more informed decision.

[inaudible remark from the gallery]

Where will it place us? Well, we will consider all the evidence because the resource persons that would otherwise have been presented by the Respondents, since the Respondents are not here, may be invited by the Panel as its own resource persons; to have a more informed decision, I believe that we should hear the other side of the issue as well.

MR. SERRANO:

Fair enough. Thank you.

PANEL CHAIR CADIZ:

Thank you for your question.

Ex-Chair Etta of CHR…

EX-CHAIR ROSALES:

Thank you, Chair. First of all, congratulations. And I'd like to thank the resource person. She really gave a very excellent presentation. Two (2) questions. One is addressed to the resource person herself. In Washington DC, you do have a belt around Washington DC which they say are the big lobbyists; they lobby for legislation. So what do you call them?

CHAIR GASCON:

K Street.

EX-CHAIR ROSALES:

K? Okay. K, ah, now these lobbyist (laughs). Actually, I think that one indicator which was brought out by the commissioners, when you're looking into the stakeholders, state responsibility, responsibility of the Carbon Majors and even responsibility of the consumers themselves, one indicator that can be seen in terms of measuring the extent of influence of these lobbyists on the kind of legislation that results from Congress. That's one measure to indicate exactly who has the responsibility, to what extent the Congress allow and tolerate this kind of profit-making businesses to go on given the awareness—their own awareness of the risks involved—the risk factors involved. So that's one. And the point also is how much effort does Congress have with respect to providing both judicial and non-judicial remedies for the consumers? So that's one question.

And then the second question is also addressed to the Commission itself. Maybe, using that approach, maybe we can also look into our own Congress and find out what extent legislation allows for big businesses that are linked to Carbon Majors in you know, satisfying themselves, allowing the passage of legislation. And the same point: What kind of remedies are allowed for the consumers and the victims given the fact that we are a state party to eight (8) of nine (9) international human rights instruments? And she pointed out, Ms. Hamilton pointed out, that there are a lot of resolutions from CEDAW, you know, we're a state party, to all these instruments, and this can be, in fact, a way of measuring the role of the stakeholders. So that's my question to you and also to the Commission, if you want to answer. Thank you.

PANEL CHAIR CADIZ:

Do you care to respond to that?

MS. HAMILTON:

Sure. One thing I would address. Realizing upon your questions that I may have overstated the lack of responsibility states have with respect to climate. I want to be clear about that. Yes, in the United States in particular, we have a case right now, Juliana v. the US and Our Children's Trust where this question of what responsibility does the United States have specifically in terms of addressing climate problems? Fortunately, that case will now enter stage discovery after the government's writ of mandamus was rejected.

I believe that there is no one size fit all with respect to states' responsibility that's consistent with international law, common and differentiated responsibilities. Your point is very well taken and there are concerns with respect to United States specifically because of the current administration, because of the withdrawal from the Paris Agreement, because of a rapid expansion, endorsement of continued fossil fuel extraction. Those stand in direct opposition to State's obligations to reduce their greenhouse gas emissions. Despite the effort to withdraw from the agreement, there is a global effort underway to reduce those emissions. So my only point would be that, I think there will be a balancing test between State's responsibilities and responsibilities of the Carbon Majors. And I do think that over time, that distinction will become more apparent.

PANEL CHAIR CADIZ:

Thank you very much, Ms. Hamilton. Counsels, do you have further questions for your witness?

ATTY. SORIANO:

We're finished, Your Honors.

PANEL CHAIR CADIZ:

Okay, we will recognize Mr. Naderev Saño of Greenpeace - Southeast Asia.

MR. NADEREV SAÑO:

Thank you. Thank you, Your Honors. I apologize for taking the floor despite the presence of our counsels. I am also a Petitioner to this Petition even before I joined Greenpeace, so now I would be wearing two (2) hats. But I am making this manifestation not just as a Petitioner but also as a Filipino and one who has roots in Tacloban City, also one who has seen, as a direct witness, the convoluted process, in the global community of trying to find a resolution to the issue of climate change.

I would like to thank the Commission for the space you are giving this issue. I am very pleased with the way you are handling this whole process, including the public hearings in the past two (2) days. I think what I want to say is that climate change is what is to be called a crisis because climate crisis is indeed a crisis and a crisis that we don't want to become worse. And the reason why we tried to do the unimaginable is because we want to avoid of the prospects of a future that is also unimaginable for all of us. I've also listened very intently to the comments of the Honorable Commissioners, and I just really want to say in this manifestation that there are issues in this world where, we ask questions about justiciability, about logic, but the climate crisis, I must say, is beyond that. And I trust, and have huge faith in the Commission despite the state of our institutions in this country. We have faith in the ability of the Commission to prove that there are courts of justice rather than just courts of law. I also trust in the ability of humanity to find a solution to the climate crisis and I feel very heartened to see that that spirit is alive in this very hall. Thank you very much.

PANEL CHAIR CADIZ:

Thank you very much for that manifestation and expression of faith in the Commission. We appreciate that.

If there are no other matters, it's already one o'clock. Clerk…

ATTY. PAUDAC:

Your Honors, may we move that our resource person be excused for today?

PANEL CHAIR CADIZ:

Yes. Thank you very much, Miss Hamilton, Doctor Hamilton. And we hope that you would be available on a later date to present yourself again before the Panel should we deem it necessary. Thank you very much. Clerk…

CLERK OF THE INQUIRY:

Your Honors, just a few administrative matters. The transcript of stenographic notes for the 11 December 2017 meeting shall be made available upon written request to the Commission through a letter or to nicc.chrp@gmail.com without any cost. The availability of the transcript of stenographic notes for this inquiry hearing shall be announced in the notice to the parties, which shall be issued by the Commission. Also, Your Honor, we have provided the dates and the venues for all the succeeding hearings. And we will be reiterating the same in our future notices. That is all, Your Honor.

PANEL CHAIR CADIZ:

Thank you very much. There being no other matters for consideration, today's hearing is adjourned.

[Bangs gavel]

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