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, THIRD HEARING, AUGUST 29 TO 30, 2018

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

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. 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 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 Inquiry Panel for today's proceedings are:

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

Please remain standing for the national anthem and the ecumenical prayer.

[National Anthem and Ecumenical Prayer]

Everyone may now be seated.

COMMISSIONER CADIZ, CHAIR OF THE INQUIRY PANEL:

[Bangs gavel]

As in the last round of hearings, we have invited Father Pedro Walpole to assist the panel in the conduct of the Inquiry. May we now request for Father Walpole to take his seat in the place reserved for (him).

Counsels, you may now enter your appearances.

ATTY. GRIZELDA MAYO-ANDA:

Good morning, Your Honors. Grizelda Mayo–Anda representing the petitioners. We are ready.

ATTY. HASMINAH D. PAUDAC:

Pleasant morning, Your Honors. Hasminah D. Paudac, representing the Petitioners, and we are ready, Your Honors.

PANEL CHAIR CADIZ:

Before we begin hearing your witnesses, may we know if there… are any other counsels present in this room who might want their presence today be put on the record, even as just observers?

If there is none, Counsel, you may now proceed to your first witness.

ATTY. PAUDAC:

Your Honors, before we proceed, may we make some manifestations?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

Your Honors, we have received four resolutions from different local government units supporting the petition and the conduct of this National

Inquiry — from the Municipality of Palo, Leyte, dated July 10, 2018; City of Tacloban, dated July 18, 2018; City of Marawi, dated July 25, 2018; and Municipality of Capalonga, Camarines Norte dated August 23, 2018, Your Honors.

Also, Your Honors, we would like to manifest the pre-marking of exhibits last August 22, 2018 marked as Exhibits "Quadruple L" up to "Sextuple G." Your Honors, we will be having additional markings of "Sextuple H" later on, and also we would like to manifest, Your Honors, that the marked exhibits already bear the original signatures of all the witnesses and resource persons. So Your Honors, your copies are with e-signatures, but the marked exhibits are with original signatures, Your Honors.

We also manifest that the Filipino to English translation of testimonies of select petitioner witnesses, namely, Mr. Pablo Rosales, Mr. Jonathan delos Reyes, Mr. Isagani Molina, and Mr. RJ de Ramos, Mr. Manuel Abinales, Mr. Pablo Taon III, and MissFrancia M. Encinas, all community witnesses during the May 23 to 24 public hearings, will be submitted next week, Your Honor, through an Ex Parte Manifestation and Submission.

And finally, Your Honors, we will be presenting five community witnesses from Tacloban City, Camarines Norte, and Ifugao today and tomorrow. May we be allowed to ask questions in the vernacular, the language the witnesses are more comfortable with, and for the question and answers to be recorded verbatim in such language?

We commit to submit the transcript and translation from Filipino to English for these community witnesses before the next following hearing. That would be all Your Honors.

PANEL CHAIR CADIZ:

Just a clarification, Counsel… the four (4) resolutions that you earlier adverted to, have they been already marked?

ATTY. PAUDAC:

Not yet, Your Honor.

PANEL CHAIR CADIZ:

Would you like them marked already?

ATTY. PAUDAC:

Your Honor, through a manifestation, we will be asking for a marking.

PANEL CHAIR CADIZ:

So this is an oral manifestation.

ATTY. PAUDAC:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Today, and the formal submission will be made...

ATTY. PAUDAC:

Right after the public hearings, Your Honor.

PANEL CHAIR CADIZ:

Tomorrow?

ATTY. PAUDAC:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Alright, and how about the additional documents that you wanted marked?

The six Hs, document HHHHHH?

ATTY. PAUDAC:

We already gave it to Atty. Martin, Your Honor.

PANEL CHAIR CADIZ:

Okay, your manifestation is noted and your requests are allowed.

You may now present your first witness.

ATTY. PAUDAC:

Thank you, Your Honor. May we call our first witness, Arthur S. Golong[1].

PANEL CHAIR CADIZ:

Good morning, Mr. Witness. May we have the witness sworn in?

Excuse me, Counsel, kindly turn on the mic.

MS. ARTHUR S. GOLONG:

I am Arthur S. Golong from Tacloban City. I am a Filipino.

PANEL CHAIR CADIZ:

Counsel, you may proceed.

Please sit down, Witness.

ATTY. PAUDAC:

Your Honor, Arthur S. Golong, is a Super Typhoon Haiyan or Yolanda survivor. He is a transgender community leader in Tacloban City. Your Honor, we are presenting the testimony of Arthur Golong to share her experience as a transgender community leader before, during, and after super typhoon Haiyan struck Tacloban in November 2013, how the climate-related event compounded gender-based discrimination, and how it changed the life of the survivor. Your Honor, before we proceed, may we request Miss Golong to identify a Statement that she prepared and submitted before this Honorable Commission.

[1]*Arthur Golong is a transgender who prefers to be addressed as "Miss."*

PANEL CHAIR CADIZ:

Please go ahead, Madam Witness.

ATTY. PAUDAC:

Magandang umaga, Arthur. (Good morning, Arthur.)

MS. ARTHUR "JEAN" GOLONG:

Magandang umaga din po. (Good morning, too.)

ATTY. PAUDAC:

Arthur, naaalala mo ba kung mayroon kang isinumiteng dokumento dito sa Commission on Human Rights? (Arthur, do you remember if you have submitted a document before the Commission on Human Rights?)

MS. GOLONG:

Opo. (Yes.)

ATTY. PAUDAC:

Kung ito ay ipapakita sa iyo, ito ba ay iyong makikilala? (If this is shown to you, will you be able to recognize it?)

MS. GOLONG:

Opo. (Yes.)

ATTY. PAUDAC:

Mayroon ako ritong isang "Salaysay ni Arthur S. Golong," limang pahina, maari mo bang suriin? (I have here a "Statement of Arthur S. Golong" in five pages, can you go over it?)

MS. GOLONG:

Opo, ito po ay sa akin. (Yes, this is mine.)

ATTY. PAUDAC:

Sa ika-limang pahina ng Salaysay na ito, mayroong lagda sa itaas ng pangalang Arthur S. Golong, may petsang August 14, 2018. Maari mo bang sabihin kung kanino ito? (On the fifth page of this Statement, there is a signature above the name Arthur S. Golong, dated August 14, 2018. Can you please tell us whose signature is this?)

MS. GOLONG:

Akin po ito. (This is mine.)

ATTY. PAUDAC:

Maraming salamat. (Thank you). Your Honor, for the record, the "*Salaysay* (Statement) *of Arthur S. Golong*" was marked, pre-marked as Exhibit "LLLL-4," and the signature of Arthur S. Golong marked as "LLLL-4-A," Your Honor.

PANEL CHAIR CADIZ:

Atty. Martin confirmed the pre-marking of exhibits.

Arthur, maaari ka nang mag-umpisa. (Arthur, you may now start.)

MS. GOLONG:

Okay, magandang umaga po sa ating lahat. At sa totoo lang, ngayon lang ako nakaharap ng ganito. So kinakabahan talaga ako. At saka sa ating mga Your Honors, good morning po sa inyong lahat, at sa lahat ng mga nandito.

(Okay, good morning to us all. To be honest, it is my first time to experience this. So I am really nervous. And to our, Your Honors, good morning to all of you and to all those who are here.)

PANEL CHAIR CADIZ:

Good morning.

MS. GOLONG:

Ako po si Arthur S. Golong, isa po akong community leader or president doon sa area namin doon sa Tacloban. At ako po ay nagmamay-ari ng isang maliit na salon doon sa bahay namin. Dati po, actually ang Arthur is nakalimutan ko na iyan. Kilala ako sa pangalang "Jean."

(I am Arthur S. Golong, I am a community leader or president in our area in Tacloban. And I own one small salon in our house. My former name was Arthur, I have mostly forgotten it. I am now known by the name Jean.)

Jean 'yong nakasanayan, but suddenly noong nag-Yolanda, kailangan kasi ang tunay na pangalan doon sa lista kasi ako ang tumayong head of family doon sa amin, doon sa nanay ko at tatay ko gawa ng matatanda na nga po sila.

(Jean was the name people used to call me. Suddenly after Yolanda, they needed the real name for the list because I was the one who stood as the head of our family in our place, since my mother and my father were already old.)

Tubong Samar ako. Lumipat kami ng Tacloban noong ako ay nine years old at nang nag-fourteen (14) years old na ako, nakipagsapalaran ako dito sa Maynila. Namasukan ako bilang katulong hanggang sa pumasok ako bilang isang beautician. Medyo matagal-tagal din ako dito sa Maynila, I think, mga seventeen(17) or eighteen (18) years.

(I hail from Samar. We transferred to Tacloban when I was nine years old and when I turned fourteen(14), I went to Manila. I worked as a helper until I found work as a beautician. I stayed quite long, roughly seventeen (17) or eighteen (18) years, here in Manila.)

*Noong 2004, nag-decide na akong umuwi sa Tacloban kasi, dito sa Maynila, ang isang beses ko na kakainin kung doon sa Tacloban, sa aming tatlo, halos dalawang beses na naming kakainin iyon. So parang gusto ko doon talaga. Doon na ako mag-work sa amin. Namasukan ako mula 2004 hanggang 2010, para makaipon at makabili ng gamit sa*parlor, *para makapagsarili, makapag-tayo ng kahit maliit na isang salamin at isang suklay sa bahay namin. Kahit papaano naman, nakabili ako at tsaka nakapag-home-service na ako.*

(In 2004, I decided to go home to Tacloban because here in Manila, the cost of one meal is equivalent to two meals for three of us in Tacloban. So I really

wanted to be there, to work in our place. I was employed from 2004 until 2010, so that I can save to purchase things for the parlor. I wanted to be self-sufficient, to be able to start even just a small salon with one mirror and one comb in our house. Somehow, I was able to buy those and I am doing home-service already.)

Nang dahil doon, iyong perang kinita at naipon ko, hindi naman sa pagyayabang, nakaipon ako kahit kaunti ng almost fifty thousand pesos (PhP50,000). Na 'yon ang pinang-pundar ko sa pinapangarap ko sa tanang buhay ko. Kasi kung nagsimula kasi kami sa wala, as in walang-wala, hanggang ngayon wala pa rin naman. Pero, naipamili ko iyon ng gamit ko na na-enjoy ko for almost one (1) month— iyong mga gamit na pinamili ko.

(And because of that I was able to save from my income. Humility aside, more or less I was able to save fifty thousand pesos (PhP50,000). I used that to fund my lifelong dream. We started with nothing, nothing at all, even now we still have nothing. But I was able to purchase things which I enjoyed for almost one (1) month.)

Iyon na, ang nangyari noong November 5, ito na, may malakas na talagang ugong. Balita na malakas daw itong parating na bagyo. So ang ginawa ko, ligpit dito, ligpit doon. Kung baga, iyong mga dapat maitabi kailangan na naming itabi, kailangan na naming ayusin.

(Then it happened. On November 5, there were reports that a really strong storm is coming. So what I did was to prepare my belongings. Those that needed to be kept safe should be put in safe place, we needed to organize things.)

November 6, that was Wednesday, nag-decide ako na ilipat na sina Nanay doon sa evacuation center sa eskwelahan. Kasi iyon nga, safe sila doon. Noong November 7, bumalik sa bahay si tatay. Sabi ni tatay huwag ka rito. Eh ako naman kasi hindi ko maiwan. Diyos ko, sa tagal-tagal kong pangarap na magkaroon ng refrigerator; kasi baka nakawin kung saka-sakali iwan ko.

(November 6, that was Wednesday, I decided to transfer my mother and father to the evacuation center at the school because they were safe there. On November 7, my father went back to the house. He told me I should not be there. But, I really could not leave the house. My God, I dreamt of having a refrigerator for a long time. It might get stolen if I left it.)

Tapos napilitan si Tatay noong November 8 na, four a.m.(4:00). Sabi ko nagluto na ako para dadalhin doon sa evacuation center doon sa aking matatanda. Sabi naman ni Tatay, "Sige pupunta na tayo doon." Magdadala lang ako ng dalawang damit kasi baka mabasa itong mga damit natin dito. Iyong ref nga namin nakatatawa, inilagay namin sa sofa. *Ano, kasi sabi ko*

kay Tatay ilagay natin iyong ref at iyong washing machine kasi siyempre wala pang isang buwan na nagamit mula noong nabili ko. Pangarap ko iyon simula pa noong maliit ako. Kasi sabi ko baka hanggang tuhod ang tubig, kaya i-ano natin, itaas. So doon.

(Then Father was forced to go on November 8, four (4:00) in the morning. I told him, I already cooked food to bring to the evacuation center for my parents. So my father said, "Okay, let us go there." I brought two sets of clothes, because our clothes might get wet here. I found it funny seeing our refrigerator on the sofa. I told my father to put the refrigerator and the washing machine over the sofa because we just got it for a month from the time I bought it. I dreamt of having it since I was little. I knew the water might reach knee-deep so we had to elevate them. So there.)

Noong pumunta na kami ng evacuation, talagang nagpumilit akong bumalik. Pinilit kong umuwi ng bahay. Sila nanay iniwan ko na roon sa eskwelahan. Noong nasa bahay na ako mga six (6) o'clock, doon ko na nakita iyong sa pelikula ninyo lang makikita. Unti-unti nang nilalamon ang bahay, hanggang sa nawala. Tapos nabuwal ang mga puno.

(When we were at the evacuation center, I really insisted, I persisted to go back home. I left Mother at the school. When I was at the house around six (6) o'clock, I saw things that you will only see in the movies. Little by little, our house was devoured by water, until it was gone. And the trees toppled over.)

*Noong time na iyon, nag-*decide *na ako na pumunta ng school. Ang problema, nabuwal na ang mga pader doon, natumba na iyong mga pader. So hindi na kami makadaan. Mabuti na lang may isang puno ng saging na nakapitan namin. Pero doon sa amin, hindi namin na-feel ang alon, na sabi nila malaking alon daw. Pero hindi namin nakita iyon. Ang nakita na lang namin parang baha. So nakakapit kami doon sa saging kung saan kami nagpaikut-ikot. Hindi namin alam. Sabi ko lang sa kanila, "huwag kayong papadyak, hindi tayo lalangoy. Magpapaanod lang tayo." Kaso, iyong time na iyon sa totoo lang, ako, hawak-hawak ko iyong cellphone ko sa kabilang kamay, tapos may hawak akong maliit na plywood, maliit lang, tatakpan ko ang mukha ko, kahit anong mangyari. Kailangan ang mukha ko ma-cover ko. Kasi di tayo ganoon kaganda eh. Eh kung mamatay pa tayong hindi maganda, hindi na maganda talaga. So iyong parang proteksyon ko lang, sa mukha ko lang. Hindi namin alam kung ilang segundo, o ilang minuto, ilang oras kami nagpaikut-ikot kasi parang umikot lang kami. Noong bandang, ewan ko kung malayo na kami, kasi ang akala namin nasa Pacific Ocean kami at that time.*

(That time, I decided already to go to the school. The problem was that the walls there already fell down. We could not pass through. Good thing there was a fallen banana tree which we firmly held on. From where we were, we

did not feel the wave. They said that it was a massive wave, but we did not see that. What we saw was like a flood. We swirled while gripping the banana tree. We did not know what to do. I told them "do not stamp your feet, we will not swim, we just need to flow with the water." At that time, I was holding my cellphone in one hand and in the other, a small plywood to cover my face. I needed to cover my face. I am not that beautiful, but I did not want to die ugly. So the only protection was for my face only. We did not know how many seconds, or how many minutes, how many hours we were spinning. I did not know how far we were. We thought we were already at the Pacific Ocean that time.)

Kasi wala kang makita. Hindi mo alam kung anong objects *na maano sa iyo eh. Kasi madilim, kasi kahit nasa dulo na ng saging iyong kinakapitan namin, di ko na makita. So ganoon talaga kadilim. At saka ang ulan, parang karayom na babaon talaga sa balat mo sa lakas ng hangin.*

(You could not see anything. You did not know what objects might hit you because it was dark. I could not even see the end of the banana tree we were holding onto. That was how dark it was. The raindrops were like needles that pierced your skin because of the very strong wind.)

So ganoon ang ewan ko, sa lahat ng... hindi namin talaga ma-express. Iyong time na iyon, may nakapa kami. Sabi ko, ay, mababa na ang tubig kasi may nakapa kaming mga dahun-dahon. Pero noong lumingon ako, sabi ko, parang may poste ng Leyeco, tinutukan, talagang tiningnan ko iyong poste ng Leyeco hindi naman siya nakahiga. Nakatayo naman. Halos maabot ng tubig ang transformer. Sabi ko, so ibig sabihin, iyon pala iyong nakakapa namin is dahon ng Talisay. Kung familiar kayo sa Talisay, mataas na kahoy iyon. So iyon pala iyong inaapakan namin. At saka, noong time na iyon, kung saan kami nag-end up hanggang sa medyo bumaba na o humupa na ang tubig, doon kami sa clubhouse ng Beta Bayview Homes, isang exclusive subdivision kung saan doon kami sa likod nakatira.

(So that's it. I do not know. We cannot really express it. At that time, we felt something. I told them, the water is getting shallow because we can feel the leaves. But when I turned around, I pointed to them the electric post of Leyeco. I really stared and realized that it was not lying down. The water was reaching the transformer and the leaves that we were touching were the leaves of a Talisay tree. If you are familiar with Talisay, it is a tall tree, and that is what we were stepping on. And until the water subsided, we ended up at the clubhouse of the Beta Bayview Homes—an exclusive subdivision at the back of our house.)

Kasi as informal settlers, doon kami nakatira sa likod nila. Ah, noong makita ko, akala ko kami lang ang tao. Noong humupa at medyo nagliwanag, doon ko nakita na ang dami-dami-dami palang tao. Na halos gumagapang pa sila

kasi malakas ang hangin papunta doon sa lugar kung saan kami nandoon. Iyong mga kahoy na nakatayo, iyong niyog na nakatayo, iyong posteng nakatayo, makikita mo, may mga tao din. Pero sa awa ng Diyos, mga buhay sila na talagang yumayakap doon sa mga lugar kung saan natamaan noong malakas na tubig. Hanggang sa nag-decide kami. Nakita ko, noong pumunta kami roon sa evacuation center, nakita ko iyong nanay ko at saka tatay ko at saka iyong pamangkin ko na seven months premature ipinanganak, sa awa ng Diyos, buhay siya.

(We, informal settlers in that area, were located at the back of the subdivision. I thought we were the only people there. When the water subsided and when the place lightened up, I saw so many people who were almost crawling because the wind that was blowing towards our location was so strong. You can see people standing on coconut and other trees, on electric poles. By God's mercy, they were alive, firmly hugging the place agaiust the strong wave. When we went to the evacuation, I saw the people there. I also saw my mother and father and my nephew, born seven-month-old premature, alive by the mercy of God.)

*Noong nakita ko sila, dali-dali kami kasi hindi nila ine-*expect *na buhay pa rin ako. So silang lahat buhay sa awa ng Diyos. Noong nag-*decide *kami na bumalik, ay ako, balikan ko iyong bahay ko. Hindi ko na talaga nakita. Hindi ko na alam kung saan iyong bahay ko, kung saan banda at saka iyong pinaghirapan kong pagkatagal-tagal. Kung baga, iyon lang ang masakit sa akin.*

(When I saw them, we rushed toward each other. They were not expecting that I was still alive. They were all alive by the mercy of God. Then we decided to go back to the house. I could not find my house, where it was located, and those things that I worked hard for a long time. That was the thing that pained me the most.)

*May higaan akong nabili talagang wala pang isang buwan ko na-*enjoy *iyon. Lahat wala. Ang nakita ko lang doon, iyong haligi na kasing-taas ng boat. Kung baga wala lahat. Lahat ng pinaghirapan ko. Nawala iyon nang isang iglap. Noon talaga, sabi ko lang sa sarili ko, makababangon ba kami? Hanggang kailan ito? Talagang* back to zero *kami. Walang-wala na kahit ano. Wala kahit damit, wala… Hindi ko nakita kung kailan kami ganito, hanggang kailan kami maghihirap.*

(I purchased a bed which I got to enjoy for less than a month. Everything is gone. What I only saw there was the column as tall as the boat. Everything was gone. All the things I worked hard for. They were all gone in a snap. I asked myself how can we overcome? Until when? We were really back to zero. We have nothing. Even the clothes were gone. I could not tell up to when we will be like this, until when will we suffer.)

ATTY. PAUDAC:

Your Honor, may we be allowed to ask additional questions for clarification or elaboration?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

Maraming salamat, Arthur, sa madamdamin mong kuwento. Ano ang naging epekto sa iyo ng bagyong ito? Pagkatapos humagupit noon ng Yolanda? Sa personal na… (Thank you very much, Arthur for that emotional account. How did typhoon Yolanda affect you personally?)

MS. GOLONG:

Nagkaroon ako ng trauma. Nag-anxiety din ako at that time, hindi ko alam kung ano kinatatakutan ko. (I was traumatized. I was anxious yet I did not know what I was afraid of.)

ATTY. PAUDAC:

Bukod dito, sa kabuhayan mo ba, mayroon bang naging epekto? (Aside from these, are there any effects on your livelihood?)

MS. GOLONG:

Malaki masyado, hanggang ngayon. Malaki, malaki masyado naging effect. *Kung baga, di pa rin kami* totally *nakababangon. Wala pa rin.* (It was a great loss up until now. There was really a big effect. We have not completely recovered. Still nothing.)

ATTY. PAUDAC:

Sa iyong salaysay, nabanggit mo dito iyong diskriminasyon na iyong naranasan. Maaari mo bang ilahad briefly *kung ano ito?* (In your Statement, you mentioned about the discrimination that you have experienced. Can you briefly elaborate on it?)

MS. GOLONG:

Kasi bilang isang leader doon sa community namin, ano. Kasi nasa permanent resettlement site kami ng Habitat for Humanity Philippines. Iyon ang nagbigay ng bahay namin. Ah, naghakot kami ng mga ilang ililipat doon. Ililipat na mga... kasi ang pabor nila, ang ilipat doon ay iyong vulnerable, sick first like mga PWD. Iyon ang inaano ng Habitat for Humanity Philippines. Tapos noong time na iyon, na naglalakad-lakad ako, may isang mama na ililipat din doon na sabi, "Sino ba itong baklang ito na paharang-harang sa daan?"

(As a leader in our community, we were in a permanent resettlement site built by the Habitat for Humanity Philippines. They gave us our house. And we gathered families to transfer there, giving priority to the vulnerable and sick first, like the PWD. That is what the Habitat for Humanity Philippines wanted. At that time, I was walking, when a man, among those to be relocated, exclaimed, "Who is this gay blocking the way? ")

So ngayon, may nakarinig doon sa sinabi niya. Sabi naman ng isang nakaano doon, ang sabi sa kanya, "Oy, di mo ba alam na iyan yong presidente dito? Presidente natin." Parang nanghingi siya ng sorry, *so sabi ko din sa kanya, "Paano kung nagkataon na hindi ako presidente?" Di ganoon din ang pag-aano nila sa akin kasi siyempre "Sino ba itong baklang ito na pahara-harang?" So parang, sandali, kung hindi pala ako naging presidente rito, kung hindi niyo ako leader, ganoon nalang ang ita-trato niyo? Paano kung naging ordinaryo, hindi ko naman sinasabing ganoon akong tao, paano kung naging ordinaryo lang ako?*

(Someone heard what he said. This person retorted, "Hey, don't you know she is the president here? Our president." He apologized. I answered him "What if I were not the president?" Would I be treated the same, "Who's this gay blocking the way?" So if I am not the president here, if I am not your leader, is that how you will treat me? What if I am just an ordinary citizen? I am not saying that I am a very important person, but what if I am just an ordinary person?)

ATTY. PAUDAC:

Kabuhayan, mayroon bang mga inalok? Livelihood programs? Sa NGOs o sa mga ahensiya ng gobyerno noong mga panahong iyon? (What about livelihood? Did they offer any livelihood programs? From NGOs or from government agencies during that time.)

MS. GOLONG:

Iyon ang masakit, kung bakit doon din ako mag-uumpisang mag-ingay. O sa totoo lang, kasi bilang community leader, eh doon sa temporary shelter namin wayback noong nasa temporary shelter kami, doon sa mga OTRS, kasi ang mga bunkhouses iba so sa OTRS kami nilagay. Ah, maraming pumupunta. Maraming kumakatok "Arthur, ilan ang buntis dito sa inyo? Arthur, ilan ang babae dito sa inyo sa inyo? Arthur ilan ang mga lalaki sa inyo at may mga livelihood kami para sa kanila? Arthur, ilan ang nagpapasuso? Arthur, iilan ang buntis?" But unfortunately, di pa ginagawa yung makabubuntis sa akin.

(That's what's so painful. That was the reason why I started to empower myself. To be honest, as a community leader, wayback when we were still in our temporary shelter in OTRS, bunkhouses were different, so we were placed in OTRS. There were lots of people coming. People would knock and ask "Arthur, how many pregnant women are here? How many women do you have here? Arthur, how many men are there in your place and we have a livelihood program for them. Arthur, how many are breastfeeding mothers? Arthur, how many are pregnant?" Unfortunately, the person who will make me pregnant has not been born yet.)

Di ba, tatanungin lang nila kung ilan iyong buntis kasi iyon lang iyong may livelihood. Hindi man lang... sa 11 months namin doon sa temporary shelter, wala man lang nagtanong, "Arthur, iilan ang bakla dito? Ang tomboy dito at mayroon kaming livelihood para sa kanila?" Hello, beautician ako. Bibigyan ako ng livelihood na carpentry or masonry. So parang ganoon. Hindi ganoon, kung baga, hindi ganoon kadali iyong dinanas namin kay Yolanda.

(Isn't it that you will be asked only about pregnant women because they were the only ones given livelihood? In my 11-month stay at the temporary shelter, not even one among those who knocked asked, "Arthur, how many gays are here? How many tomboys and we have livelihood for them?" Hello! I am a beautician and they offered me a livelihood like carpentry or masonry. It is like that. It is not that easy. What we have experienced with Yolanda is not that easy.)

ATTY. PAUDAC:

Sa mga nasabi mo na Arthur, mayroon ka pa bang huling gustong sabihin? (With the things you have said Arthur, are there any last message you would like to say?)

MS. GOLONG:

Ah may (Speaking in Waray)... Hala, nakakapag-Waray ako. May sasabihin ako. Ah kung saka-sakaling may magbibigay, may gusto lang akong iparating sa gobyerno o kung kanino. Ah, i-try naman kasi nilang tanungin iyong tao. Hindi iyong sila ang magdidikta o hindi nila didiktahan iyong tao. Tanungin nila kung ano talaga ang kailangan, hindi iyong sasabihin nila, "May ibibigay kami sa inyo ganito." Tanungin naman kasi kami ang nakaaalam. Kami ang may alam at kami kasi ang dapat tinatanong, hindi iyong pupunta roon at "May ano kayo…" Parang ganoon ang gusto kong iparating.

(I have… Oh no, I was speaking in Waray. My message to the government or anyone—Try to ask the people, not this way. Do not dictate, do not dictate what the people need. Ask them what they really need and not just say, "We will give you this." Ask us because we know. We know and we are the ones you should ask. Not like someone will go there in our place and say, "We have this for you…" This is what I want to convey)

At isa pa, dito sa mga malalaking kumpanya, kung saan sila, hindi ko man masabi kung sila talaga ang liable o ano, kasi ako, talagang wala din akong alam. Base lang sa mga naririnig ko at base sa mga pinipuntahan ko, dapat gumawa din sila ng may alternatibo lalo na itong ating mga petroleum companies. Gumawa sila ng alternatibo na hindi para sa iisa, sa kapakanan ng iisa, sa kapakanan ng nakararami. Kagaya ngayon, doon sa amin meron nang solar na jeepney o e-jeep. Bat di sila gumawa ng ganoon na hindi naman tayong lahat, hindi ang lahat nagsasakripisyo sa dinudulot. Kasi parang sa pagkakaalam ko sa sixty-fivepercent (65%), seventypercent (70%) tama ba ako? Iyong carbon na na ano doon? So gumawa sila ng alternatibo.

(And one more thing, to the big companies, wherever they are. I cannot say if they are liable or what because I really do not know anything. But based on what I have heard and the places I have been, our petroleum companies should make alternative ways that will not only benefit one but the majority. Like now, in our place, we have solar jeepneys or e-jeeps. Why do they not make that so that not everyone will suffer because of its effects.Because from what I know, the sixty-five percent (65%), seventy percent (70%), am I right? The carbon is there. So they should make an alternative.)

ATTY. PAUDAC:

Maraming salamat, Arthur. (Thank you very much, Arthur.) That will be all for our witness, Your Honors.

MS. GOLONG:

Puwede pa akong mag-ano? (Can I still say something?)

ATTY. PAUDAC:

Yeah, *sige*, Arthur. (Yeah, go ahead, Arthur.)

MS. GOLONG:

Kaisa din kami sa nagpasasalamat, Your Honors, lalo na sa GreenPeace International, na kaming mga maliliit nabigyan ng pagkakataon na maipahayag o marinig kung ano iyong mga naranasan namin, at saka kung ano talaga ang kailangan namin – iyon lang po at maraming salamat sa inyong lahat.

(One with those who are grateful, Your Honors, especially to GreenPeace International, people like us have been given a chance to express our experiences and what we really need, and be listened to. That is all, thank you very much everyone.)

ATTY. PAUDAC:

Wait *lang* (just wait), Arthur. Your Honor, that will be all for our questioning, unless you do have questions.

PANEL CHAIR CADIZ:

The members of the panel… now give questions to the witness. We will start with Commissioner Armamento.

COMM. LEAH C. TANODRA-ARMAMENTO:

Good morning, Arthur.

MS. GOLONG:

Good morning po, Your Honor.

COMM. TANODRA-ARMAMENTO:

I would like to know during your lifetime, you are now forty-two (42) years old. Have you experienced a similar kind of weather disturbance before Yolanda?

MS. GOLONG:

*Hindi po. Parang ang mga na-*experience *lang namin noon iyong simpleng bagyo, Your Honor.* (No. We just only experience simple typhoons, Your Honor.)

COMM. TANODRA-ARMAMENTO:

Follow-up question. Can you like tell us what do you think are the changes in your community or the physical environment that contributed to the worsening weather disturbance in Tacloban City?

MS. GOLONG:

Ah, malaki po, Your Honor, yung naging contribution. (It's sigificant, Your Honor, the contributions…)

COMM. TANODRA-ARMAMENTO:

Kaya kong Tagalugin Arthur, Bisaya din kasi ako. (I can translate in Tagalog Arthur because I am also Bisaya.)

MS. GOLONG:

Bisaya na lang Ma'am. (Let's just use Bisaya language, Ma'am.)

COMM. TANODRA-ARMAMENTO:

Kaya lang Samar ka, Panay naman ako. Ganito na lang. Hindi ba sa lifetime, sinabi mo, worst ngayon ang nangyayari ano? Ano ang sa tingin mo mga nagbago sa lugar ninyo na naging contributory na dahilan kung bakit mas grabe ngayon ang mga bagyo?

(But you are from Samar, I am from Panay. Okay, let's do this instead. You mentioned that in your lifetime, the situation now is the worst. What changes in your place do you think have contributed to or became the causes why we have severe typhoons?)

MS. GOLONG:

Ah, sa akin sa totoo lang, magmula nang nag-Yolanda, napansin ko ang dami ng sasakyan sa Tacloban. Ah naka-experience na rin kami ng traffic doon, na kung dati hindi naman ganoon ka-traffic noon, sabi namin, bakit noong nag-Yolanda ay dumami tuloy ang yumayaman. Dumami ang may mga sasakyan. So iyon ang nagiging cause *kasi ng ano natin.*

(In my opinion, with all honesty, from the time of Yolanda I have observed that there are many cars in Tacloban. We are now experiencing traffic compared to before. We were wondering why there were lots of people getting rich after Yolanda. There is an increasing number of car owners. So that is the cause of what we are experiencing.)

PANEL CHAIR CADIZ:

Commissioner Gwen Pimentel-Gana, you may now ask questions.

COMM. GWENDOLYN L. PIMENTEL-GANA:

Maayong buntag. (Good morning.)

MS. GOLONG:

Maayong buntag, (Good morning) Ma'am, Your Honor.

COMM. PIMENTEL-GANA:

Katulad ng sinabi ni Commissioner Leah, ano sa unawa mo, sa iyong pagka-intindi ba, ang rason ng pagbaha? (Just like what Commissioner Leah has said, what do you think, in your own understanding, is the reason why it flooded?)

MS. GOLONG:

Sa pagkakaintindi ko rin po, dahil po ito sa climate change. Nalaman ko lang ito after Yolanda. Kung ano ang climate change, kung ano ang dahilan ng climate change at kung at kung sino ang gumagawa at kung paano nagkakaroon nito.

(Based on my understanding, it is because of climate change, which I just learned after Yolanda. The meaning of climate change, the reason behind climate change, whoever is responsible, and how it happens, like that.)

COMM. PIMENTEL-GANA:

Kung sa Tacloban, ano kaya ang immediate cause *sa tingin mo, sa Tacloban mismo?* (What is the immediate cause in Tacloban?)

MS. GOLONG:

Sa Tacloban siguro, iyong walang habas na… parang hindi naman madaming puno roon. Ah, iyong sa basura po. Kasi parang basura din ang ibinalik sa Tacloban, parang ang iitim na galing na sa ilalim ng dagat.

(Maybe in Tacloban, there are not enough... the trees are not that abundant there. Oh, the garbage. Because it is as if the garbage we threw returned to Tacloban, very black garbage that came from the bottom of the ocean.)

COMM. PIMENTEL-GANA:

Okay, *sabi mo* (you said), a few weeks before *na nagkaroon ng baha* (the flood), the local government already prepared you.

MS. GOLONG:

Yes.

COMM. PIMENTEL-GANA:

Nasabihan ba kayo? Paano nila kayo hinanda sa darating na bagyo? (Were you informed? How did they prepare you for the upcoming typhoon?)

MS. GOLONG:

Actually, in fairness naman sa City Government of Tacloban, talagang inano nila iyong tao. Talagang sinabihan nila. Prepared talaga sila. Ang mga tao kulang pa kasi ng kaalaman regarding sa preparedness. Kasi umano naman na lang iyan eh noong nag-Yolanda halos kung baga nabugbog sa training *ang mga tao.*

(Actually, in fairness to the City Government of Tacloban, they really informed the people. They were really prepared. However, people lack knowledge regarding preparedness. People were given lots of training only after Yolanda.)

MS. GOLONG:

Ang mga tao lang talaga... Kahit ako, hindi ko sisisihin ang gobyerno, kundi ang sarili ko kung bakit nagkaroon kadami ang casualties. *Hindi mo naman kasi iisipin, at sinong nakaiintindi ng storm surge? Pero kung sinabing mag-tsu-tsunami o tidal wave, posible pa na ang mga tao ay makinig. Pero sa storm surge, wala. Kahit ano pa, nalaman na lang namin iyong* storm surge *noong nangyari na ang Yolanda. Malaking alon din pala yun o malaking tubig. Ay, wala talagang makakaalam. "Ay, nako may* storm surge *na darating." Eh ang mga tao, "Ay nako, hmp! Keber! Wala akong pakialam. Malay ko ba kung ano iyan." So talagang kahit kami, wala. Ganoon talaga kung bakit nagkaroon ng... nasa tao din. Ayaw talagang lumipat, kasi hindi pa naman naka-experience ng kung anu-anong mga kalamidad na ganoon.*

(It is the people. I will not blame the government. Instead, I will blame myself for the huge number of casualties. Because of that, of course, because you would not think of it. And who knew about storm surge? But if tsunami or tidal wave were mentioned, people would have listened. But since it was called storm surge, nobody did. We just learned about storm surge after Yolanda – that it was a huge wave or a massive amount of water. No one really knew about it. People would just say "Oh my gosh, hmp! I do not care! What do I know about that?" So even to us, the [information drive] has no effect. They do not want to transfer because they have no experienced calamities like that.)

COMM. PIMENTEL-GANA:

So parang may information naman na binigay. (So information was given.)

MS. GOLONG:

Oo! (Yes!)

COMM. PIMENTEL-GANA:

Kaya lang hindi naintindihan. (But it was not understood.)

MS. GOLONG:

Yes, Your Honor. *Parang maganda din iyong ginawa ng Tacloban, talagang nag-ikot din naman sila.* (What Tacloban did was quite good. They really went around.)

COMM. PIMENTEL-GANA:

Doon sa sinabi mo sa livelihood program na gender-issue, sinabi mo na sa mga lalaki, sa mga babae, no? Ito bang livelihood program ng gobyerno actually most of the time ganoon na ang treatment? Babae, lalaki, wala… Hindi ka ba, hindi mo ba naisip na kung siguro itong binigay na livelihood ay kahit na sinabi nilang lalaki puwede rin namang pasukan ng babae 'yon. Hindi ba? Or mayroon talagang distinguished? Mga lalaki, ito lang ang sa inyo. Mga babae, ito lang ang sa inyo. Ano?

(About what you said regarding the livelihood program offered by the government and the gender-issue, were you treated like that most of the time? Men, women… Did you not think that it is possible for women to join programs offered for men? Or should a distinction be made, like, this is only for men and that is only for women?)

MS. GOLONG:

Opo, kasi ganoon po Your Honor ang nangyayari. Kapag pumupunta sila, iilan ang babae? Iilan ang lalaki? So parang may time pa nga na may isa akong kaibigan na may nagbibigay kasi ng mga fish cages. Parang hindi siya pinasali kasi bakla nga raw siya. Ay samantalang may mga babae naman na kasali. So may diskriminasyon talaga na nangyayari at that time.

(Yes, because that's what is happening, Your Honor. They would come and ask for the number of women, the number of men. There was a time when they were giving fish cages. My friend was interested but they refused to let

him join him because he is gay. Contrarily, they have female participants. So there was really discrimination that time.)

COMM. PIMENTEL-GANA:

So nakikita ninyo? (So you witnessed it?)

MS. GOLONG:

Opo. Kita talaga at saka hindi lang kita, ramdam na ramdam po talaga. (Yes, yes. More than seeing, we truly felt it.)

COMM. PIMENTEL-GANA:

Thank you.

MS. GOLONG:

Welcome *po*.

PANEL CHAIR CADIZ:

Commissioner Karen Gomez-Dumpit, you may now give your questions.

COMM. KAREN LUCIA S. GOMEZ-DUMPIT:

Maupay nga aga. (Good morning.)

MS. GOLONG:

Maupay din nga aga. (Good morning too.)

COMM. GOMEZ-DUMPIT:

Ah, puwede ba kitang tawaging Jean? (Can I call you Jean?)

MS. GOLONG:

Yes *po*, Your Honor.

COMM. GOMEZ-DUMPIT:

Jean, itatanong ko lang, nasabi mo na iyong ekspiryensiya mo tungkol sa bagyo o sa weather, tapos iyong mga assistance na binigay sa inyo na hindi kayo tinatanong kung anong kailangan ninyo. Pero matanong ko lang, mayroon bang mga pribadong kumpanya na tumulong? Na alam mong tumulong sa komunidad katulad ng carbon majors na sinasabi? Mayroon bang nag-reach out na pribadong kumpanya doon sa pagtulong sa mga nasalanta noong Yolanda?

(Jean, I would like to ask, you mentioned your experience about the typhoon or the weather and the assistance that was given to you, that they did not ask what you needed. But may I ask, were there private companies which rendered help that you know helped the community? For example, the Carbon Majors that you were saying? Did any private company reach out in helping the victims of Yolanda?)

MS. GOLONG:

Marami, Your Honor, kagaya ng Shell Foundation. *Tumulong din sila sa amin* in terms of *mga* disaster preparedness. (There were lots, Your Honor, like Shell Foundation. They also helped us in terms of disaster preparedness.)

COMM. GOMEZ-DUMPIT:

Pero noong nasalanta na kayo at nangangailangan kayo ng mga basic na pangangailangan? Mayroon bang katulad ng Shell Foundation*na tumulong sa inyo?* (After you were struck by the typhoon and were needing aid for your basic necessities, were there companies like Shell Foundation that helped you?)

MS. GOLONG:

Hindi, iyong Shell Foundation, ngayon na talaga. Maraming nagbigay, pero mga INGOs, galing sa ibang bansa. Iyon talaga iyong nakatulong sa amin. Pero iyong iba, nakikipag-coordinatelang sila sa City Government of Tacloban.

(No, the Shell Foundation was helping recently. After the typhoon, there were lots of assistance but mostly international NGOs. They were the ones that helped us the most. But the others, they have coordinated with the City Government of Tacloban.)

COMM. GOMEZ-DUMPIT:

So nakasalalay sa City Government *ang pag*-distribute *ng tulong sa inyo?* (So the distribution of help to you is dependent on the city government?)

MS. GOLONG:

Yes *po*, Your Honor.

COMM. GOMEZ-DUMPIT:

Okay, *sige. Salamat*, Jean. (Okay, alright. Thank you, Jean.)

PANEL CHAIR CADIZ:

The Chair of the Commission might want to field in some questions.

CHAIR GASCON:

Magandang umaga, *Jean.* (Good morning, Jean.)

MS. GOLONG:

Magandang umaga din po. (Good morning, too.)

CHAIR GASCON:

Salamat sa iyong pagtatatag at pagpupundar para sa sarili at sa pamilya mo. Bago pa dumating ang sakuna, at kahit na natapos na, patuloy kang nagbibigay-lakas hindi lamang sa pamilya mo, kundi sa komunidad mo bilang leader at gusto kitang bigyan ng pagpupugay dahil sa tibay ng loob mo.

(Thank you for the hard work to uplift yourself and your family before the calamity and even after it happened. You continued to give strength not only

to your family but to your community as a leader. And I want to commend your inner strength.)

*Gusto ko lang mag-*follow-up *sa ilang mga tanong. Sabi mo sa tanong ni Commissioner Karen, na nadatnan mo, na-engkwentro mo iyong ilang institusyon ng carbon majors ay tumugon din. Pero kailan po nangyari iyon? Iyong sabi mo bigay ng* Shell Foundation *ay* disaster preparedness seminars*, iyon ba?*

(I just want to follow up on a few questions. When you answered the question of Commissioner Karen, you said that you found and encountered several Carbon Majors responding as well. When was that? You said that Shell Foundation gave disaster preparedness seminars, is that the one?)

MS. GOLONG:

Opo (Yes), Your Honor.

CHAIR GASCON:

Kailan nangyari iyan? Isa, dalawa, tatlong taon pagkatapos? (When was that? One, two, three years after?)

MS. GOLONG:

Last month.

CHAIR GASCON:

Ah, noong nakaraang buwan. (Ah, last month.)

MS. GOLONG*:*

Nitong ano lang, nitong taon lang na ito. (Just recently, just this year.)

CHAIR GASCON:

'Yong mga nakaraang mas malapit sa sakuna? (But in the past, closer to the calamity?)

MS. GOLONG:

Actually, ang Pilipinas Shell Foundation nagbigay din sila ng bahay doon sa mga vicinity ng mga area nila sa Tacloban, iyong sa mga may depot nila. 'Yon iyong kinuha nilang community na binigyan nila ng pabahay. I think one hundred fifty (150) o one hundred eighty (180) units.

(Actually, the Pilipinas Shell Foundation also gave housing in their vicinity area in Tacloban where their depots are located. That is the community they adopted and they gave them houses. I think about 150 or 180 units.)

CHAIR GASCON:

Siyempre kung pabahay po iyan, mas maaga po iyan, hindi one month ago *lang.* (Of course, if that is a housing program that was given earlier, not after the calamity.)

MS. GOLONG:

Ay, iyong mga pabahay po... Pero iyong preparedness *po na ginawa nila* islast month, I think. *Kasi ako din ang nag-*facilitate. (Oh, the housing program. But the preparedness training they conducted was last month, I think, because I was also the one who facilitated.)

CHAIR GASCON:

It might be useful for us if we write a letter of inquiry to the Pilipinas Shell Foundation about what programs they did in the area soon after. Just to get the sense about the corporate social responsibility approaches. I would also be interested actually in knowing what the content of the seminars would be in particular. Is there any reference in their teaching or education that has to do with the impact of pollution on climate change or their activities on climate change, if there is some form of acknowledgement. I think this is relevant due to what we have been hearing over the last few sessions about denial and I would like to know if there is change that is happening, if any, and ultimately, the least, perhaps from denial to acknowledgement might begin. *Pangalawa, gusto ko lang ma-check, sabi mo noong natapos iyong sakuna, ang una ninyong kinalagyan ay sa* Habitat. *Tama po ba iyon?* (Secondly, you mentioned that after the tragedy you first stayed in the Habitat? Am I right?)

MS. GOLONG:

No, iyong temporary shelter *po,* Your Honor. *Iyong parang mga sawa-sawali na mga bahay.* (No, we stayed in the temporary shelter, Your Honor. The houses were made of *sawali* woven bamboo strips.)

CHAIR GASCON:

Nagtagal po kayo doon? O nakabalik na po ba kayo sa dati ninyong tinitirikan? (Did you stay there for a long time? Or were you able to go back to where your previous house was built?)

MS. GOLONG:

Eleven (11) months *po kami doon. Sa ngayon po, nandito na po kami sa* Habitat for Humanity housing units permanent shelter. (We stayed there for 11 months. As of now we are staying at the Habitat for Humanity housing units permanent shelter.)

CHAIR GASCON:

Ah, so nagkaroon ng temporary *muna, iyong mga sawa-sawali.* (So there was a temporary shelter first, the one made of *sawali* woven bamboo strips?)

MS. GOLONG:

Yes *po*.

CHAIR GASCON:

Pagkatapos ng labing isang (11) buwan, nakalipat na kayo sa mas permanente? (After eleven (11) months, you transferred to a more permanent Habitat structure?)

MS. GOLONG:

Yes *po*.

CHAIR GASCON:

Itong sa Habitat, *hindi po ito sa lugar ng bahay ninyo dati?* (This Habitat place, this is not where you had your house before?)

MS. GOLONG:

Hindi po, Your Honor. Kasi iyong lugar ko po dati ay sa Barangay 88, iyon ang most devastated area po ng Tacloban. Doon po kami galing, after eight (8) months... Nag-eight (8) months pa din po kami doon sa Barangay 88 before po kami na-transfer sa temporary shelter.

(No, Your Honor. We stayed in Barangay 88... the most devastated area in Tacloban – where we came and where we still stayed for eight (8) months before we were transferred to the temporary shelter.)

CHAIR GASCON:

*Ah, so una, walong (8) buwan kayo doon sa 88, iyong pinaka-*devastated, *tapos* temporary shelter *ng* eleven (11) months. *Tapos ngayon po sa*Habitat. (Oh, so at first, you stayed at 88 for eight (8) months, that was the most devastated area, then you stayed eleven (11) months at the temporary shelter and now at the Habitat?)

MS. GOLONG:

Opo. (Yes.)

CHAIR GASCON:

Ano po ang nangyari doon sa Barangay 88*? Pinapayagan pa bang magtirik ng bahay doon?* (What happened to Barangay 88? Are you still allowed to build houses there?)

MS. GOLONG:

Actually, Your Honor, parang ayaw na pong payagan doon lalo na iyong area na pinanggalingan namin. Hindi na po ina-allow na pabahayan. Kasi talagang pasok po siya sa forty-meter (40m) no-build zone. Ang nangyayari kasi talagang itong ating mga kapatid ay talagang, basta iyon na iyon. Kami talaga noong mga timena iyon kahit umano lang ako sa dagat parang feeling

ko nandiyan na naman si Yolanda. Talagang umalis kami kaagad doon. Doon sa trapal-trapal lang iyong eight (8) months na tinirahan namin noon. Talagang sako lang yung bubong namin. Kasi gusto na talaga naming ma-transfer doon sa mas mataas na lupa kung saan hindi na kami aabutin.

(Actually Your Honor, they really do not like it especially in the area where we came from. They are not allowing us to build houses there because it is within the forty-meter (40m) no-build zone. What happened was our brothers are, well that is it... In our case, during that time, whenever I see the ocean I can feel Yolanda happening again. We decided to evacuate immediately. We stayed in a shelter with tarpaulin panels for eight (8) months, with roof made of sacks. We really wanted to be transferred to higher land where the water cannot reach us.)

CHAIR GASCON:

Maganda ang iyong paliwanag. May ipinipilit na ipatupad na mitigating remediation effort, no-build zones na malapit sa shoreline, at iba pa. At sinasabi mo, o inimply mo, sabi mo, na mahirap ma-enforce.

(Your explanation is good. That they are trying to implement mitigating remediation effort, no-build zones in places near the shoreline, and others. And you are saying or implying that it is difficult to enforce.)

I note that earlier in the manifestation, there was a resolution from the City of Tacloban in support of this process. I wonder if it might be useful as part of our Inquiry to find out what local governments, particularly in these devastated areas, have undertaken in terms of lessons learned from this process. *Kasalukuyan ba ay pinuno ka parin sa inyong lugar?* (Are you still the leader in your place?)

MS. GOLONG:

Yes *po*, Your Honor.

CHAIR GASCON:

Iyong samahan ng mga nakatira. (The association of the residents.)

MS. GOLONG:

Yes *po*. *Yong* (The) Homeowners Association *po*.

CHAIR GASCON:

Liban po doon, ikaw ba ay isang lider ng mga LGBT? (Aside from that, are you a leader of the LGBT community?)

MS. GOLONG:

At the same time *po*, Your Honor.

CHAIR GASCON:

So may asosasyon rin po kayo? (So you also have an association?)

MS. GOLONG:

Yes *po*.

CHAIR GASCON:

Na-document ninyo po ba itong, may nakuwento ka itong naranasan mong medyo discriminatory statements pero humingi naman ng paumanhin nang malaman na presidente ka at napa-isip ka na kung hindi ka lang presidente eh baka nagpatuloy iyon? Nabanggit mo mayroong isang hindi nabigyan ng fish cage dahil LGBT. Iyong mga ganoon bang insidente, bilang komunidad ng LGBT ay naisulat ninyo, para at least malaman naman po natin?

(Were you able to document the experiences you mentioned about the discriminatory statements; although he apologized after knowing that you were the president, that made you think that if you were not their president, the discrimination might have continued? You also mentioned about the one who was not given fish cage because of gender. Those incidents, as an LGBT community, should be documented, at least for us to know?)

MS. GOLONG:

Hindi po, Your Honor. Kasi parang binalewala na lang namin iyon at that time. Noon kasi, kasagsagan pa iyon ng Yolanda. After noon, nagsimula na rin kaming lumabas. Maybe that issue is naano na sa ibang mga... anong tawag nito, mga kagaya ng Oxfam po na INGO naka-ano na doon sa issue. Kasi iyong dati, iyong gumawa sa amin, kung baga sila ang gumabay sa amin for almost three (3) years I think.

(No, Your Honor, we just ignored it at that time because it was also the height of Yolanda. After that we started coming out. Maybe the issue was noted by INGOs like Oxfam. They were the ones who organized and guided us for almost three years, I think.)

CHAIR GASCON:

So iyong pakikipag-ugnayan ninyo sa isang INGO *na* Oxfam*, napansin mo na may* sensitivity *o pagkabukas sa* gender issue. (So you as you were collaborating with one agency, the Oxfam, did you observe if there is sensitivity to or acceptance of gender issues?)

MS. GOLONG:

Yes *po*, Your Honor.

CHAIR GASCON:

Pero sa iba, nakita ninyo rin po ba iyon o nagpatuloy po ba iyong naranasan ninyong diskriminasyon bilang LGBT*?* (But with the others, were you able to observe that or you are still experiencing discrimination as LGBT?)

MS. GOLONG:

Sa ngayon po Your Honor*, parang medyo nabawas-bawasan na iyong diskriminasyon sa mga* LGBT *sa amin.* (As of now, Your Honor, the discrimination against the LGBT in our place got lessened.)

CHAIR GASCON:

Ugnay na rin po iyan dahil nagkumpol kayo, nanindigan, at nagpahayag... sinabi ninyo, "Mali kayo." (That is also linked to your being organized, standing side by side, and declaring "You are wrong.")

MS. GOLONG:

Yes *po*, Your Honor.

CHAIR GASCON:

Pero makatutulong pa rin po sa amin itong mga naranasan ninyo noong panahon na iyon. Sana maisulat nang makita po namin iyong uri ng diskriminasyon na naranasan ninyo bilang komunidad. Nabanggit mo sa simula noong nagpakilala ka na matagal kang nakilala bilang Jean.

(But these incidents you had experienced during those times can really help us, if you can document it. At least we can see what kind of discriminations you have experienced as a community. You mentioned in the beginning, when you were introducing yourself that you are known as Jean for a long time.)

MS. GOLONG:

Yes *po*, Your Honor.

CHAIR GASCON:

Pero dahil nga sa nasalanta kayo, kinailangan mong bumalik sa pangalan mong Arthur. *Puwede mo bang ipaliwanag kung bakit?* (But because you were hit by the typhoon, you needed to use your name Arthur again. Can you explain why?)

MS. GOLONG:

Kasi po noong nag-Yolanda na, iyon nga po, gaya ng sinabi ko kanina, nakiusap ako sa DSWD kung puwede po na ako ang maghe-head ng family namin kasi si tatay hindi na able, tapos si nanay din hindi na kasi matanda na nga. So nag-prepare ako na parang ako na lang, at sila ang magiging kargo ko. Sinabi ng DSWD puwede naman. So iyon nga, kaya kailangan kong gamitin talaga iyong pangalan ko para doon sa list. At saka saarea kasi namin, hindi ka pupuwedeng ma-elect as homeowners officer kung hindi ikaw mismo, or kung hindi ang asawa mo. Kung anak lang, hindi puwede, kailangan talagang house owner ka talaga or ang asawa ang puwedeng ma-elect as officer.

(When Yolanda happened, like what I have said earlier, I asked DSWD if I can be considered as head of our family because my parents are too weak to fulfill their responsibilities, as they are already old. I prepared for that. So they will be my beneficiaries. The DSWD representatives said it is possible. That was why I needed to use my given name for the list. Also, in our area, only the husband or the wife can be elected as homeowners' officer. If you are just

the child, you cannot represent the parents. It is necessary that you are the entitled house owner or spouse if you want to be elected as officer.)

CHAIR GASCON:

So kinailangan mong gamitin iyong pangalan mo sa Civil Registry *para makakuha ng serbisyo publiko.* (So you have chosen to use your name in the Civil Registry in order that you can claim public service?)

MS. GOLONG:

Opo (Yes), Your Honor.

CHAIR GASCON:

Para makilala bilang pinuno at house owner, *at* head of the family*?* (For you to be known as an officer and house owner and head of the family?)

MS. GOLONG:

Opo (Yes), Your Honor.

CHAIR GASCON:

Sa tingin mo, okay lang po ba iyan, o kailangan rin po ba natin? I mean, bilang bahagi ng mga rekomendasyon na maaring tingnan ng Commission on Human Rights itong sabihin nating, gender-based identification after birth. Siyempre nasa mga dokumento ninyo iyan, pero hindi ko lang alam kung napapanahon na po ba na sa karanasan mo ang inyong gender-based identity ay mabigyan na ng sabihin nating legal support.

(In your opinion, is that okay or do we need it? I mean, so that this gender-based identification at birth can be included as a part of the recommendations that the Commission on Human Rights can look into. Of course, you have documented that already, I just do not know given the progress at this time. Is it timely, based on your experience, for the issue on gender-based equality be given legal support?)

MS. GOLONG:

Yes *po*, Your Honor. *Talagang malugod na tatanggapin iyan ng komunidad ng* LGBT. *Baka suportang bonggang-bongga ang maibigay diyan.* (That will be wholeheartedly welcomed by the LGBT community... and with a very loud and extravagant support.)

CHAIR GASCON:

Of course, kailangan pong pag-aralan iyan. At noong panahon na naipanganak ka, iyan ang naibigay sa iyong pangalan. Bagama't hindi mo masyadong nagamit. (Of course, we still need to study that. And when you were born, that was the name given to you although you do not use it most of the time.)

MS. GOLONG:

Masama ang loob ko talaga, pero okay lang. (I am very disappointed, but it's okay.)

CHAIR GASCON:

Tapos, noong kinailangan na, dahil kailangang magpakilala, siguro nawala pa lahat ng mga legal documents *mo ano?* (And then when it was needed, because you needed to identify yourself, I assume you also lost all your legal documents, right?)

MS. GOLONG:

Yes *po*, Your Honor.

CHAIR GASCON:

So kailangang ma-reconstruct. *Kapag magpapakilala ka, "Ako si* Jean.*"* (So there's a need to reconstruct... when you introduce yourself you say, "I am Jean.")

MS. GOLONG:

Hindi po, walang record *dito. So* Your Honor*, parang naibalik din kasi maraming mga ahensiya din ang tumulong sa amin na makuha din ang mga* legal documents. (No, there was no record here. So Your Honor, we got our legal documents back because there were many agencies that helped us claim and process them.)

CHAIR GASCON:

Mahalaga po iyan. (That is important.) Actually, this is one issue we have been encountering time and time again in the context of conflict or disaster, whether natural or man-made. Internally displaced persons are often unable to access public services without appropriate formal or legal documentation, and so we do really need to take a look in a big way at what different agencies are doing to ensure that accessible legal documentation services are provided to the victims at the soonest time possible.

Salamat ulit, Jean. *Baka mayroon ka pang gustong ihayag bago natin ibukas pa sa ibang mga tanong.* (Thank you again, Jean. You might want to give additional manifestations before we welcome other questions.)

MS. GOLONG:

Ah, okay na po ako, Your Honor, at maraming salamat din po sa inyo. (I am fine, Your Honor, and thank you very much to you as well.)

PANEL CHAIR CADIZ:

Thank you very much, Mr. Chairman.

Father Pedro Walpole, would you have questions for the witness?

DR. PEDRO WALPOLE:

Salamat po. Jean *sa bahay mo na iyon, matibay ba iyong bahay? Parang* satisfied *ka diyan?* Safe? (Thank you. Jean, is your house sturdy? Are you satisfied with it? Is it safe?)

MS. GOLONG:

So far po, Father, ano po siya, talagang, actually ang resilient na term nalaman ko lang din iyon after Yolanda. So far, sabi nila typhoon-resilient daw. At saka parang okay naman po ang pundasyon ng bahay namin. May mga ibang ano lang po, iyong sa iba, no comment. Basta iyong sa amin, okay po iyong bahay po namin.

(So far, Father, actually I learned the term resilient only after Yolanda, they say that the houses were typhoon resilient. The foundation of our house looks fine. The others, however, I cannot comment. But ours is okay.)

DR. WALPOLE:

Malayo ba ang bahay mo kaysa dati – nandoon ka sa sentro, yeah? *Sa 88. Pero ngayon, saan iyong bahay? Malapit din sa* Tacloban*?* (Is it far? Compared to when you were in the center, yeah? In 88? Where is your house located now? Is it near Tacloban, too?)

MS. GOLONG:

Medyo malayu-layo po kasi nandoon na po kami sa may area na malayo sa dagat, fifteen (PhP15) pesos na po ang pamasahe from downtown to Norte. Nasanorthern part na po kami ng Tacloban sa ngayon. Iyong dati po, eight or nine (PhP9) pesos lang po ang pamasahe namin from downtown to Barangay 88.

(It is quite far because we are already located in the area far from the sea. Our fare from downtown to Norte is 15 pesos. We are now at the northern part of Tacloban. Our fare before was 8 or 9 pesos from downtown to Barangay 88.)

DR. WALPOLE:

Yeah, okay, so *para sa iyo nandoon ka sa Norte, ano ba iyong* climate change *sa iyo?* (So now that you are located in Norte, what is climate change for you?)

MS. GOLONG:

Sa totoo lang po, hindi ko masyadong kabisado ang climate change, so parang ang ano lang namin noon ay kapag gumawa ka ng hindi maganda o iyong pollution po, sampol ang mga nagsusunog, iyon lang po ang naiintindihan namin. Wala po talaga kaming idea at that time about climate change. Kung

hindi nag-Yolanda, hindi nila sinabi, "Ay, kasi kagagawan ito ni ganoon, kagagawan ito ni ganito." So parang baselang po sa naririnig po namin, Father.

(To be honest, I am not really familiar with climate change. What we just know before is what you did something that is not good or the pollution, for example, when you burn; that's what we only understand. At that time, we did not really have an idea about climate change. If it wasn't for Yolanda, they will not have said, "It's the fault of that, it's the fault of this." That is only based on what we heard, Father.)

DR. WALPOLE:

Okay, so*kung may sunod na bagyo, ano ang gagawin ninyo? Iyong isip ninyo sa bagong lugar okay naman* safe *kayo, hindi kailangang mag*-evacuate*?* (Okay, so if there will be another typhoon, what will you do? Do you think that you are safe in your new location, that you do not need to evacuate anymore?)

MS. GOLONG:

Okay, opo Father. Talagang kung baga para sa amin kaya kami nilipat, iyon lang ang masasabi ko, seguro naman ang gobyerno natin, hindi naman siguro nila kami ililipat doon kung talagang kailangan pa namin ulit lumipat kapag dumating ang bagyo o kung anumang sakuna. Kasi pagkakaintindi ko sa kanila, ginawan kami ng bahay na resilient. So para sa akin, hindi namin kailangang maglipat kasi iyon ang sabi nila. Ano na daw yung bahay namin, matibay.

(Yes, Father. It is really for our own sake that's why we were transferred. What I could say is the government would not have relocated us if they will have to transfer us again to another site when there will be another typhoon or calamity. What I understand from them, they created resilient houses. So for me, we do not need to transfer anymore because that is what they said, that our houses are sturdy.)

DR WALPOLE:

Okay, *maraming salamat*. (Okay, thank you very much.)

MS. GOLONG:

Welcome *po.*

PANEL CHAIR CADIZ:

Thank you very much, Father Walpole.

I have no further questions for the witness. The witness may now be excused, thank you very much.

Counsels, you may now proceed to present your next set of witnesses.

ATTY. MAYO-ANDA:

Good morning again, Your Honors. Our next witnesses are two experts from the Manila Observatory, Dr. May Celine Thelma Vicente and Dr. Rosa Perez.

PANEL CHAIR CADIZ:

Please swear-in the witnesses.

So this is an innovation which we have made with the Inquiry. Here, we are presenting two (2) witnesses simultaneously because the witnesses have manifested that they will be more comfortable if they will be allowed to testify together as one (1) group. So, Counsel, please go ahead.

First, let's swear-in the two (2) witnesses.

DR. MAY CELINE THELMA VICENTE:

I'm May Celine Vicente, Filipina, from the Manila Observatory.

DR. ROSA PEREZ:

I am Rosa Perez, Filipina, and I am from the Manila Observatory.

PANEL CHAIR CADIZ:

Counsel, you may now proceed to examine your witnesses.

ATTY. MAYO-ANDA:

Thank you, Your Honor. Dr. May Celine Thelma Vicente is a specialist on geological information system and remote sensing, while Dr. Rosa Perez is a meteorologist. They are both experts from the Manila Observatory. We are offering them as resource persons and witnesses to be able to share the most recent climate scenarios as well as their study on children's vulnerability to climate change and disaster impacts. But before we proceed Your Honors, we have four documents that we want them identified.

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

So Dr. Vicente and Dr. Rosa Perez, I have here an abstract, one (1)-page abstract, could you identify this piece?

DR. PEREZ:

Yeah, I recognize this is the abstract that I sent through email.

DR. VICENTE:

Yes.

ATTY. MAYO-ANDA:

There is a brief Curriculum Vitae in the name of Dr. Rosa Perez, do you recognize this document consisting of four pages? And there's a Curriculum Vitaeof Dr. May Celine Thelma Vicente consisting of twenty-six (26) pages, would you please identify this?

DR. VICENTE:

This is the one that I submitted.

PANEL CHAIR CADIZ:

Excuse me Counsel… just for the record, so that the responses can be captured by our stenographer, could you please speak to the mic? There are two microphones… one can be given to the counsel and the other one to the witnesses.

ATTY. MAYO-ANDA:

Our apologies, Your Honor.

PANEL CHAIR CADIZ:

No problem. Thank you.

ATTY. MAYO-ANDA:

And the last document, Drs. Perez and Vicente, is a Country Scoping Study consisting of twenty-seven (27) pages. Do you recognize this PowerPoint presentation?

DR. PEREZ:

Yes *po.* That's the whole transcript.

ATTY. MAYO-ANDA:

Okay. These four (4) documents, Your Honor, have been previously marked last August 22nd 2018. The abstract has been pre-marked as "MMMM." The Curriculum Vitaeof Dr. Rosa Perez as Exhibit "NNNN," the Curriculum Vitaeof Dr. May Vicente as Exhibit "OOOO." And the last document referring to "Country Scoping Studies to Build Evidence in Children's Vulnerabilities" has been pre-marked as Exhibit "PPPPP." Could we get a confirmation from Atty. Martin Esguerra?

PANEL CHAIR CADIZ:

Excuse me, before you confirm… Attorney Esguerra, you said five Ps, but in the manifestation that you presented… submitted to us, there are only four Ps, Exhibit "PPPP" to "PPPP-26."

ATTY. MAYO-ANDA:

We apologize, Your Honor. This is supposed to be "PPPP." Probably when Dr. Vicente made a slight change on one of the slides... that's a slide error. So we beg your indulgence. So can we seek a confirmation now, Your Honors?

PANEL CHAIR CADIZ:

Will Attorney Esguerra confirm the pre-markings?

ATTY. ESGUERRA:

(inaudible confirmation)

PANEL CHAIR CADIZ:

Alright, it has been corrected, as manifested there by Attorney Mayo-Anda. You may now proceed to examine your witnesses.

ATTY. MAYO-ANDA:

So may we now call on the experts. This is a shared presentation, Your Honors, and I understand that Dr. Vicente will start first.

DR. VICENTE:

I'll lead and then I will let Dr. Rosa explain the climate scenarios, and then it's back to me.

ATTY. MAYO-ANDA:

Okay. Please Proceed.

PANEL CHAIR CADIZ:

Please start.

DR. VICENTE:

Okay, so this is entitled "Country Scoping Studies to Build Evidence on Children's Vulnerabilities to Climate Change and Disaster Impacts" in the Philippines. It was a report submitted to the UNICEF-Philippines by the Manila Observatory last 4 September 2014, about four (4) years ago. And the outline of the presentation includes risk variables that we investigated, the climate change impact chain on children's vulnerability, climate hazards, exposures, vulnerabilities, risks, and conclusions and recommendations.

So this is very small. Your Honors may not be able to see from the monitor. But let me explain that this framework follows the concept that risk is a function of hazards, exposures, and vulnerabilities.

In this study, for hazards, we primarily concentrated on temperature and rainfall. And for exposures, we considered the number of children and youth, and the exposure of children to physical and social hazards by type especially related to climate change. So the bullet points referred to topics we covered, while the checked points as I edited are the topics where we found secondary data on.

So under the vulnerabilities, which is the focus of the study, we considered child socio-economic profiles, child security and child health and nutrition, child mortality and causes, child development, child adaptive capacity and resilience, and links to water and food security and shortage. So under the bullet points we marked as checked those topics or indicators where we found secondary information on. But the negative marks reflect a dearth of information at the time of the study in 2014.

And the next slide refers to a simplified impact chain undertaken by Dr. Rosa Perez where you have climate change and associated geohazards affecting physical changes such as environmental degradation and destruction in turn affecting economic situations or conditions as well as impacts on children. Such impacts on children include decline in socio-economic status, threats to child development and rights, declining child health and nutrition, as well as threats to child security.

Dr. Rosa will now explain the climate hazards in two (2) versions at the time of the report considering SRES scenarios and the next slide using the latest so-called representative concentration pathways.

DR. PEREZ:

In the scientific community, we use scenarios to see the future impacts, risks, and hazards. But for this we only covered the hazard part which are the climate

variables. During the time of the study, we used the prevailing model which is the SRES (or Special Report on Emission Scenarios) by the IPCC (or Intergovernmental Panel on Climate Change). This SRES is based on story lines. They have in the future, if there is a population, what you call, increase or decrease. There is also the state of economy in the future which we call near future and far future. The near future is the year 2025 and the far future is around 2050 and of course the farthest one is 2100, the end of this century. This SRES during the time of the study was so constrained because you cannot change the story line. It is a "what if the conditions are this and the future will become that." Okay, so it is a "what if and then." So the IPCC has changed this to the so-called Representative Concentration Pathways, or RCPs. In the representative concentration pathways, the current projected climate change scenarios, these use the amount of the greenhouse gases that has already been emitted to the atmosphere. So it's a more realistic scenario because it starts with the current condition and then with modelling, it develops to, let's say, a future which is worst case, which means we do not do anything about the situation and the best case is we do something about the situation. So that's the RCPs we call it.

And the advantage of the current scenario is that you can introduce some policy changes into the scenario. So along the way, you might have started with the worst case scenario but also along the way you introduce mitigations, in climate change parlance. When we say mitigation, we meant avoiding or reducing greenhouse gas emissions so that the impacts will also be lessened which coincide now with the definition in the disaster community. So basically, that is the difference of the two scenarios. But during our study, we used the earlier SRES, which is the best case during that time which means it is a balanced use of resources, the population increase, but there is a tapering or peaking in 2050, and then decreasing population towards the end of this century. So it's a best case scenario. Thank you.

DR. VICENTE:

When we use the different scenarios we arrived at different hazards. So for the RCPs, with the exception of mountainous regions, there are more than twenty-six degrees (26°) the temperature will increase uniformly and minimallySo the increase in the temperature is more gradual than the previous one, the SRES. That's why some of us are being called doomsayers because the earlier scenarios are quite grave but the RCPs are more realistic. And the RCP 8.5 worst case scenario, the driest rainfall could go beyond 40 percent reduction. Still there are some grave pictures but it's not like the SRES which is unrealistic and RCP 8.5 is already the worst; so it cannot get worse than that scenario.

The increase in Luzon…basically we'll have an increase in rainfall but in Mindanao there will be a decrease. So that is the picture of the future using the RCPs. Thank you.

DR. PEREZ:

But I would like to say that the variability of the rainfall, as the PAGASA is the one who generated this scenario, is within the natural variability. That means that what we are observing now, it is something like that, but can only be enhanced by the climate change or the increase in temperature or global warming we call it.

DR. VICENTE:

So we segue into exposures. We covered number of children in 2000, 2003, and 2006 – 2000 is dark green in the bar chart, 2003 is light green in the middle bar chart, and 2006 is moderate green in 2006. So as you can see, there are very slight increases in number of children through the years with concentration in the Central Luzon area and with emerging higher number of children in the axis across Bicol to the Visayas.

And then for vulnerabilities, we were able to map children in poverty by region and by province in 2006. So here you have greater number of children in poverty in Central Luzon area and then in the Central Visayas, with very moderate numbers in the Mindanao area. So that's children in poverty.

We go now to vulnerabilities. In terms of child labor, chemical, biological, and environmental hazards – to which working children are exposed – threaten their health and safety. When environmental ecological conditions are already poor, natural hazards exacerbate these further. Sensitivities of child exposure to slow and rapid onset disasters must be analyzed as by established impact change earlier shown. Actually, that impact chain is more complex but there is a request from UNICEF to simplify it for better understanding.

We segue now into migration of parents and families. These are found to be increasing towards less hazard prone areas and/or to those areas where better economic opportunities are available. There is a rise in children affected by loss and constrained household livelihoods and incomes.

On displacement: Poor children displaced or separated from families are particularly vulnerable to violence such as child trafficking and commercial sexual exploitation. Child victims are from disadvantaged communities, mostly in remote areas and have only basic education. They also belong to

households below the poverty line. Children as such are easier to recruit and attract especially because of the promise of high salaries and better opportunities in major cities.

On poor child health and nutrition: These are directly attributed to inadequate food intake and diseases. Poverty that leads to household food insecurity are attributed to unavailability of food both in quality and quantity. Child morbidity and mortality including diarrhea, malaria, and malnutrition are directly affected by climatic parameters such as temperature and rainfall. In effect, poor children are particularly vulnerable to climate change. As they live in areas with common and major climate sensitive health outcomes such as malnutrition, diarrhea, and malaria. They are also highly sensitive to consequences of climate changes.

On hunger: About one point seven million (1,700,000) families were food poor in 2003.MANILA, Philippines – Around seven point nine million (7,900,000) Filipino families consider themselves poor in terms of food, the latest survey of the Social Weather Stations (SWS)[2] revealed. This figure represents thirty-six percent (36%) of the respondents in a self-rated poverty survey conducted in the first quarter of 2015. The number is a five (5)-percentage point decrease from last December's forty-one percent(41%), which equates to about nine point one million(9,100,000) families.

Food poverty thresholds increased by twenty-six percent (26%) from 2006 to 2009, compared to only twenty-two percent (22%) between 2003 and 2006. In 2009, food poor households had incomes just below or equal to the monthly food threshold of about three thousand three hundred ninety-five point forty-two pesos (PhP 3,395.42). In 2010, approximately thirty-nine percent (39%) of children aged zero to ten (0-10) experience severe food deprivation. Growing infants and children without enough food are expected to experience physical and cognitive setbacks. This will especially prevent the attainment of the Millennium Development Goals, which are now Sustainable Development Goals.

So the map shows quality of life index among children by region in 2006; and as you can see, the darker the color the less the quality of life. So the upper portion of Luzon is better than the Southern half of the Philippines in terms of quality of life among children in 2006. Next slide.

In terms of children experiencing severe deprivation of sanitation facilities in 2006, there is another map which is similar for that quality of life except that things are clearly better for children in the upper half of Luzon and moderately

[2]https://www.rappler.com/move-ph/issues/hunger/92207-sws-food-poverty-survey-first-quarter-2015

in Mindanao. So in the Southern Luzon, Visayas, towards Palawan, there are severe deprivation of sanitary facilities.

On morbidity and causes: Diarrhea, malaria and respiratory diseases have aggravating effects worsened by undernutrition. Malaria is one of the serious health problems especially across children. It is the eighth leading cause of morbidity. There were forty-eight 48 cases per one hundred thousand (100,000) in 2002. The prevalence is high in Mindanao at fifty-three percent (53%), Luzon at forty-six percent (46%), and Visayas at one percent (1%). There are provinces that are listed here where there are most cases, namely, Palawan, Tawi-tawi, Agusan del Sur, Sulu, Davao del Sur, Isabela, Davao del Norte, Compostela Valley, Apayao, and Cagayan. There are more than a million deaths each year with respect to pregnant women and children under five. With increasing temperatures, malaria may arise and/or return to places where they once were eradicated through programs and development practices.

On child mortality and causes: These are directly proportional to the educational level and wealth status of the mother and family, respectively. The infant mortality rate for mothers without education is high at sixty-five (65) per one thousand (1,000) live births. There are only fifteen (15) per one thousand (1000) live births per mothers with higher educational attainment. Then, from 1995-2003, poor households have higher under-five (5) infant mortality rates than wealthier households. There is also higher infant mortality rate that could be linked to the mother's age. The older mother during pregnancy have higher risk levels due to biological factors and complications. On education, literacy, status on enrollment, and dropouts: Out-of-school children arise from employment opportunities, lack of personal interest, house-keeping responsibilities, and high-cost of education. Among socio-economic factors, there's high prevalence of poverty so a high dropout rate. Children opt often to become economically active to help sustain their households. Climate change will exacerbate educational status and deteriorating nutritional and health conditions render children unfit for school. The next slide is a map showing child experiencing severe deprivation by water. So in the areas around the Mountain Province, there is high deprivation of water. And then from Central Luzon, around Metro Manila, down to Mindanao there are moderate to high levels of water deprivation.

We go now to combined HEVs (Hazards, Exposures, and Vulnerabilities or Risks). Okay. So you have the first map to the upper left as the number of children by region with a high concentration around Metro Manila and nearby Southern Luzon and there you have the Panay Province and the South Western Visayas and Mindanao. And then we already showed that poverty incidence in the upper right is shown by the map where you have the upper Luzon area under better conditions in terms of poverty incidence than the Southern Luzon, Visayas and Mindanao. And then we recall the climate scenarios that were

undertaken using SRES in the bottom half of the PowerPoint for temperature to the lower left and rainfall to the lower right.

So conclusions and recommendations. Children are central to climate change and human security concerns. Children's issues are not yet, at the time of the study, well incorporated into environmental agenda whether national, regional, or local. Climate change impacts broader sustainable agenda especially for poverty reduction and Millennium Development Goals now named as Sustainable Development Goals and expanded strategies responsive to children's needs are necessary especially towards better adaptation and resilience. Climate change would form major constraints to meeting MDGs targets especially concerning children. Children are also considered agents for social change.

A human rights-based approach is needed to include children's issues. It is important to integrate children's agenda to governmental processes. Adaptation must incorporate children's perspectives. Opportunities for country-shared learnings and for local actions involving children and youth are required. Climate change definitely impacts on children especially because of their sensitivity in the form of child vulnerability as evidenced by impact chains. Partnerships are keys to success.

The promotion of the roles and contribution of children and youth are necessary but are challenges to climate change and disaster risk. Greater human security on a long-term basis is important to consider especially since children growing up become also future policy and decision makers. There is a lack of accurate age-specific and spatially referenced local data on vulnerabilities of children and the sensitivity of hazard exposures and vulnerability variables need to be researched and established so that targets and strategies in space and time may be addressed.

So I will just read through, there are many frameworks from which we can learn and adapt in the Philippine case for involving children in climate change adaptation and disaster risk reduction. So these are ones from the Institute of Development Studies on Children and Climate Change, there's another one on the planning process and environmental education which may involve children, and there's another one on how children's capacities may be developed so as they can participate better in the management of the environment as they grow up. So this is what the PowerPoint shows.

DR. PEREZ:

I just wish to say that this study is just a scoping. Attribution is a very complex research study and we cannot... this study is not meant to delve into a deeper attribution of the children's vulnerability to climate change. So this is just the

surface, we need more research to be able to make reasonable conclusion about attribution. Thank you!

ATTY. MAYO-ANDA:

Thank you Drs. Vicente and Perez. Your Honors, can I ask just one (1) question?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

Since you mentioned Dr. Rosa about the nature of the study which is just a scoping, are you aware Drs. Vicente and Perez whether there have been additional studies since 2014 looking into children's vulnerabilities to climate change and disaster impacts?

DR. PEREZ:

The researches are very sporadic, they are not, you know, systematically addressed to that kind of attribution. So while there are studies on current factors why children are vulnerable, these are not in the way of risk assessment. So that one is in our wish list when we are able to continue this research.

DR. VICENTE:

I just know that following the study, maybe in a couple of months or year, there was a call to establish a management information system. So I know that may exist in UNICEF now. However, I am not sure if it is spatial or geographic in nature so that we can map risks across the country to children.

ATTY. MAYO-ANDA:

My last question is on the recommendations, if you know or are aware if any of the recommendations that you actually wrote in the study were adapted by the government or any non-government institution?

DR. PEREZ:

I am not aware of any move from the national level but in the international scene, they are now bringing youth in the picture. Like in the UNFCCC there are now some segments that youth are properly represented but these are not children, these are a little bit older than children, but still in the youth category.

DR. VICENTE:

May I just emphasize because I think it is very important that we acquire indicators and statistics on certain gaps, in very important gaps on vulnerability like violence against children, conflict, drug trafficking, child trafficking, more common health problems and diseases arising from disasters, and also I think those ones.

ATTY. MAYO-ANDA:

Your Honors, please, if the commissioners have questions.

PANEL CHAIR CADIZ:

Thank you very much, madam, and to our lady witnesses.

Commissioner Armamento will ask you questions.

COMM. TANODRA-ARMAMENTO:

Good morning, Ma'ams. I am just curious because your study, although it is a scoping study, shows that the worsening weather conditions increases the vulnerabilities of children. Is it safe for me to conclude then that the worsening weather condition affects children and makes them more vulnerable?

DR. PEREZ:

There are manifestations of climate change on the environment. For example, on malnutrition, malnourished children are not the direct result of climate change but because food security is the one being affected by the climate change so it's really a chain of impacts. That's why it is very important to have this kind of analysis. I think that children's vulnerabilities is more on the downstream of the impact chain so we have to be very careful also in the

analysis so as not to make irrational conclusions that these are the direct effects of climate change. Thank you.

PANEL CHAIR CADIZ:

Commissioner Pimentel earlier manifested that she will have no questions for you. Commissioner Karen Dumpit will also be waiving her asking of questions.

Chairman Gascon? Oh, yes. Left already?

Father Walpole? Father Walpole will have no further questions.

I have no further questions. Thank you very much to our witnesses.

ATTY. MAYO-ANDA:

Thank you Drs. Perez and Vicente. You are excused.

PANEL CHAIR CADIZ:

Maybe we can have a five-minute break before we proceed to your next witness.

[Bangs gavel]

[Break]

CLERK OF THE INQUIRY:

All rise. The Honorable Inquiry Panel Chairman, Comm. Roberto Eugenio T. Cadiz, still presiding.

PANEL CHAIR CADIZ:

[Bangs gavel]

We are now resuming our session. Counsels, you may now present your next witness.

ATTY. HASMINAH D. PAUDAC:

Good morning again, Your Honors. May we call our third witness or resource person, Mr. Richard Heede?

PANEL CHAIR CADIZ:

Correction… actually, Mr. Heede would be your fourth resource person because the previous testimonies were done in tandem, by two.

ATTY. HASMINAH D. PAUDAC:

Okay, Your Honors. We submit, Your Honors.

PANEL CHAIR CADIZ:

Good morning, Mr. Heede.

Can we have the witness sworn in? Please go ahead.

CLERK OF THE INQUIRY:

Before the Commission, kindly raise your right hand. Do you swear to tell the whole truth of your testimony and nothing but the truth?

DR. RICHARD HEEDE:

I swear to tell nothing but the truth in my testimony.

CLERK OF THE INQUIRY:

Kindly state your name, your citizenship or nationality.

DR. HEEDE:

My name is Richard Heede, I am an American citizen, born in Norway and my address is on Gateway Road in Snowmass, Colorado.

CLERK OF THE INQUIRY:

Okay, thank you.

ATTY. PAUDAC:

Mr. Witness, how do you want to be addressed by this Panel of this representation?

DR. HEEDE:

You may call me Richard, that's fine.

ATTY. PAUDAC:

Okay, thank you, Richard. Your Honors, Richard leads the Climate Accountability Institute's "Disruptive Carbon Major Project" which traces carbon dioxide and methane emissions to the largest corporations that produce and market carbon fuels worldwide. The initial work was published in Climatic Change in 2014 with the lead story in The Guardian. Rick has analyzed potential emissions from oil, gas, and coal companies proven reserves vis-à-vis the remaining carbon budget and with colleagues modelled the temperature and sea level rise attributable to major carbon producers.

Richard also published his thesis, "A Geography of Carbon" with the National Center for Atmospheric Research in 1984, and worked on "Energy Efficiency and Climate Mitigation" with the Rocky Mountain Institute in 1984 to 2001. He created the Consultancy Climate Mitigation Services in 2001 to inventory corporations, industrial facilities, municipalities, households, and aviation emissions. Richard is here to present the findings of the Carbon Majors Publications including the cumulative contribution from the investor-owned carbon majors to world emissions of industrial carbon dioxide and methane emissions.

Your Honors, before we proceed with the presentation of Richard, may we be allowed to ask questions for identification of documents that he submitted before this Honorable Commission?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

Richard, I have here several documents that you submitted to this representation and to the Honorable Commission. I will read them one by one, okay? And please tell this Honorable Commission if you confirm having submitted these documents.

First is a Profile and Statement of Richard Heede, dated August 7, 2018 consisting of twelve (12) pages pre-marked as "QQQQ" to "QQQQ-11," the Curriculum Vitae of Richard Heede consisting of six (6) pages pre-marked as "RRRR" to "RRRR-5," the printed PowerPoint presentation of Richard Heede Climate Accountability Institute's "Quantify the Contributions of Carbon Producers to Climate Change and Climate Damages" consisting of twelve (12) pages pre-marked as "SSSS" to "SSSS-11," Climate Accountability Institute press release on "Update of Carbon Majors Project" consisting of two (2) pages pre-marked as "TTTT" to "TTTT-1," and earlier we have pre-marked Climate Accountability Institute press release on "Update of Carbon Majors" dated August 28, 2018 consisting of two (2) pages pre-marked as "TTTT-A" to "TTTT-A-1." Next document is a "Carbon Majors Accounting for Carbon and Methane Emissions 1854-2010, Methods and Results Report" consisting of one hundred four(104) pages pre-marked as Exhibit "UUUU" to "UUUU-103," this was previously marked as D-2. Next document is "Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854 to 2010" consisting of fifteen (15) pages pre-marked as "VVVV" to "VVVV-14," this was previously marked as "D-3." Next document is "Supplementary Materials Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854-2010" consisting of ten (10) pages pre-marked as "WWWW" to "WWWW-9." Next document is "The Climate Responsibilities of Industrial Carbon Producers: Climatic Change" consisting of fifteen (15) pages pre-marked as "XXXX" to "XXXX-14." Next document is "The Potential Emissions of Carbon Dioxide and Methane from Proved Reserves of Fossil Fuels: An Alternative Analysis" consisting of nine pages pre-marked as "YYYY" to "YYYY-8."

The next are supplementary materials: "The Potential Emissions of Carbon Dioxide and Methane Improve Reserves of Fossil Fuels: An Alternative Analysis" consisting of four (4) pages pre-marked as "ZZZZ" to "ZZZZ-3;" "The Rise of Global Atmospheric Carbon Dioxide Surface Temperature and Sea Level from Emissions Trace to Major Carbon Producers" consisting of fourteen (14) pages previously marked as Exhibit "H" to "H-13;" and, the last document, "Carbon Producers' Tar Pit Dinosaurs Beware: The Path to Accountability of Fossil Fuel Producers for Climate Change and Climate Damages" consisting of sixteen (16) pages pre-marked as "AAAAA" to "AAAAA-15." Richard, do you confirm having submitted these documents to this Honorable Commission?

DR. HEEDE:

Yes, these are all documents I submitted and… *(Inaudible sounds)*

ATTY. PAUDAC:

Do you confirm that the contents of these documents are the truth?

DR. HEEDE:

Yes.

ATTY. PAUDAC:

Can we go back to the first document which is your Profile and Statement consisting of twelve (12) pages?

PANEL CHAIR CADIZ:

Excuse me, Counsel, can you please turn on the microphone of Mr. Witness?

ATTY. PAUDAC:

Oh, sorry. Sorry for that, Your Honor.

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

In your Profile and Statement, dated August 7, 2018, consisting of twelve (12) pages, on the 12th page, there appears a signature above the name Richard Heede. Whose signature is that, Richard?

DR. HEEDE:

That is my signature.

ATTY. PAUDAC:

Do you confirm and affirm the Statement you stated in that Profile and Statement, Richard?

DR. HEEDE:

Yes, Ma'am.

ATTY. PAUDAC:

Thank you, Richard.

PANEL CHAIR CADIZ:

Counsel, before you proceed, I just noticed that you earlier manifested that Exhibits H to H-13 are previously marked, but you did not indicate the previous marking.

ATTY. PAUDAC:

Yes.

PANEL CHAIR CADIZ:

Could you please clarify this for the record?

ATTY. PAUDAC:

Yes, Your Honor. Exhibit "H" to "H-13" was previously marked. That is the marking, Your Honor, we didn't change the marking, it was through a manifestation before Your Honor.

PANEL CHAIR CADIZ:

Alright, and just for clarification again, let's go back to Exhibit TTTT to TTTT-1… it was stated that it was previously marked as D-1 as presented by a previous witness, I suppose...

ATTY. PAUDAC:

No, Your Honor. Earlier during the pre-marking we had last December 2017, you mentioned that we have to re-mark this because you want every document to be marked as one (1) letter. So if you will notice, the pre-documents "D-1" to "D-13" these are voluminous documents that is why we did not use the original marking of "D-1," "D-2," and "D-3," and we marked it as "TTTT" as a separate document, "UUUU" as separate document, and "VVVV" as separate document, Your Honors.

PANEL CHAIR CADIZ:

But these are essentially a different set of documents.

ATTY. PAUDAC:

No, Your Honor, these are the same documents. We just re-marked them, so that there will be no confusion because, as you will see, the Exhibit "D," "D-1," "D-2," and "D-3" are separate documents, and these are voluminous documents, and this representation understands that previously you want separate letters for every document, Your Honor. So that is why we adapted a separate marking, Your Honor.

PANEL CHAIR CADIZ:

I'm still not too clarified on that. Attorney Esguerra, do you have the documents there with you? Do you have… Can you show me these documents?

So, I will understand how the markings were changed so we will be able to follow the testimony of the witness. The original...

Counsel, please proceed.

ATTY. PAUDAC:

Thank you, Your Honor. Richard, please start your presentation.

DR. HEEDE:

Good morning, Honorable Commissioners. Pleased to be here.

PANEL CHAIR CADIZ:

Good morning.

DR. HEEDE:

On behalf of the Petitioners before the National Inquiry on Climate Change to present the results of my work in a brief presentation and then take your questions afterwards.

So I run a small non-profit institute called Climate Accountability Institute that was founded in 2011 for the purpose of exploring the climate accountability of various actors particularly large fossil fuel and cement companies. The conventional way, sorry, that was one too many. The conventional way of apportioning responsibility to various actors around the world is based on the U.N. Climate Convention in 1992. That stipulated that developed nations in their common but differentiated responsibilities must take lead in dealing with the issue. And this focused attention on the national emitters and emissions within the territory of one hundred ninety-seven (197) countries in the world and that was up to the leading developed wealthy countries to take the lead as Annex 1 countries to deal with issue and help avoid the worst of climate change. That has been affirmed with various climate meetings of the parties, particularly in Paris in 2015 with the Paris Accord, and these are important steps forward.

And just looking at the chart here, we can see the rise of global CO_2 emissions worldwide in the black top line followed by a… five (5) of the largest countries in the world and their annual emissions since about 1800, since about 1900. And we can see in the red is the United States and the yellow line is China having now surpassed the United States as the largest current emitter of carbon dioxide. But if you look at the historical responsibility, which was one of the principles embodied in a UNFCCC document framework convention, historical emissions are the primary drivers of climate change and so the history of country's emission really matter.

And you can see here in the central bubble that the United States is the single top emitter since the Industrial Revolution in about 1750 with about twenty-four percent (24%) of the total global emissions of carbon dioxide from industrial resources. That made colleagues of mine and myself to start thinking about what if we shifted responsibility away from simply nations and consumers as emitters to the corporations and the supply chain of fossil fuels that drive national emissions around the world?

So the basic principles involved is that we felt and we would later prove that the corporations have provided the lion's share of emissions and fossil fuels to global markets. They have been aware of the threat of climate change of their products since at, least, in 1960s as Caroll Muffett will testify later on. They have also misled consumers, investors, and legislators on the climate risks and these corporations also has the technical skills, the capital, and in my view the moral responsibility to help address the problem that they helped create through the proliferation of their products for decades.

This work started in 2000. The initial work started in 2003 with the look at one individual oil company over its history from 1882 to 2002, published in my "Methods and Results Report on ExxonMobil." With Friends of the Earth who also then published a summary brief estimating the temperature response and sea level rise from this one company's emissions over time since 1882. Now, here it's important to note that the change and the pivot and focus of this research was to not only count the direct operational emissions of one particular company over its history, but more importantly to include the emissions from the products it's extracted, refined, processed, transported, and sold to markets around the world. This, as we later find out, is about ninety percent (90%) of total emissions attributable to most companies.

So once the early study on ExxonMobil was studied and published, collaborators of mine and I decided that we would expand the project to include the largest corporations that have supplied fossil fuels and cement to global markets. And we established a threshold for inclusion in the list. We wanted a manageable list of less than one hundred (100) entities. We established a threshold of about eight million metric tons (8,000,000 MT) of carbon emitted per year. And with that list, we found about fifty(50) investor-owned companies, companies that you know by the names of Shell, and Exxon, and BP Petrol in France Statoil in Norway, Petrobras in Brazil, and on and on around the world, and China, and Asia, and Africa, of course, and Europe, and United States.

Thirty-six (36) of these companies were coal companies; fifty-four (54) were oil and gas companies; and then we included seven (7) large cement companies because in the process of making cement, there's an industrial emission source of carbon dioxide converting limestone into cement and releases the carbon dioxide as an industrial process. We gathered data from

sources around the world on these ninety (90) Carbon Majors as they have become now. We want to use historical data from the producers themselves to the extent that data was available. So we scouted libraries around the world to find annual reports and bear in mind that investor-owned companies are required since the establishment of the U.S. Securities and Exchange Commission Act of 1933 and 1944 to disclose to shareholders what its production has been whether that be of vacuums or on tons of coals since the 1930s.

Many companies reported earlier than 1930s such as the Standard Oil but we wanted to use original documents and statements from the corporations themselves about how much oil in barrels, cubic feet of natural gas, and tons of coal they had produced during the preceding fiscal year. We enter production data and a sequence of Excel spreadsheets noting particularly for oil, coal, and gas; what the quality of the product was, particularly for coal because the carbon content of coal varies dramatically from the rank – from low level low energy content lignite and brown coal to the high quality bituminous coal. So we want to accurately track how much of the carbon in each kind of product would end up in the atmosphere. So it's important to consider the rank of coal, for example.

It's also important to consider how much of petroleum in particular is diverted into non-energy uses such as petrochemicals for plastics and lots of other uses, road oil for making asphalts, and macadam lubricants for lubricating machinery, waxes – those kinds of things that, in net, do not enter into the atmosphere. We wanted to focus on the amount of carbon in each unit of product that was combusted by its customers and ended up as carbon dioxide in the atmosphere. And I also want to state here that we used a precautionary and careful conservative methodology in choosing emissions factors by fuel. If we had a choice and arrange what those emission factors would be, well, we tend to be rather conservative in our selection of emissions factors, we would be conservative in estimating how much of each oil and gas company's own fuel was used in their refineries and pipelines for example.

The work was extensively peer-reviewed both before and during publication of the seminal paper in Climatic Change that you have a copy of. We mentioned that there's a results and methodology report that was concurrently written that delve deeply into the methodology and the assumptions, and the caveats, and the sources of data – both corporate and global emissions factors data – that was reviewed by an expert team in the Netherlands. As to the veracity of the methodology, we made some minor improvements and revised the methodology and results report and thereupon endeavored to write a paper that ended up in Climatic Change, which also has a separate peer review process for professional journal sent to three or four anonymous peer reviewers who then provided a series of comments and suggestions on how to

improve the study, and it was finally accepted and published in Climatic Change in January 2014.

Here is a map of the headquarters of most of the Carbon Major entities. So we can see there's a broad distribution of where these corporations and state-owned companies are headquartered.

So let's look at some of the data. I know you can't read this small print here. This one gives you a sense of how the data was gathered on Excel spreadsheets. This one is for Peabody Energy in the United States, it has produced coal since before World War II and I have data from 1945, I think, forward. And on the left side on the yellow columns we note what kind of coal was mined year by year. And on the green column, we saw, we combine in metric tons what the result was and that is then transferred to another spreadsheet that summarizes for each of the coal companies what their annual production was. And to the analysis of emissions factors, we convert that annual production by coal rank into emissions for each company, for each year. And this is just a sample of one of those summary worksheets.

Now oil and gas companies having in some cases acquired and merged with lots of other companies across this history, we look at Chevron from 1912 to 2016, oil liquids, crude oil and natural gas liquids are on the left half, natural gas is on the right half. For each of the companies that have eventually now become Chevron including Texaco, Tenneco, Gulf, Getty Oil, and several other companies that has become what the company is now. And again, in the green column we collect all their mergers and acquisitions for each of these companies in the green column in the center.
So if we combine the estimated emissions, those that end up in the atmosphere net of non-energy uses, compare that to the global rise in industrial sources of CO_2 from fossil fuels and cement in the black line on top and the red line is the total sum of all the ninety (90) Carbon Majors over that same period of time. So we can see there's a fairly good correspondence between the rise of emissions attributed to carbon majors compared to the global total. And I have focused only on industrial sources of carbon dioxide and methane leaving aside other sources from deforestation for example, or nitrous oxide emissions, or non-energy methane from landfills and rice paddies, for example, because I wanted to focus just on the industrial emissions.

In this graph, it is showing that the history of half a dozen companies has varied very greatly overtime and this shows ExxonMobil and Chevron in the mid-sixties being larger companies than they are now; and Gazprom and Saudi Aramco as these two (2) examples of the rise of state-owned oil and gas companies being now predominant.

So if we look at some individual state-owned and investor-owned companies in this table; please refer to the text, say, don't go blind looking at the chart.

But these large oil and gas companies, the largest of which over time is Saudi Aramco at fifty-eight billion (58,000,000,000) tons of carbon dioxide equivalent over its history compared to total global industrial emissions of CO_2 and methane of one point seven trillion (1,700,000,000,000) tons of CO_2 equivalent. So Saudi Aramco is three point four percent (3.4%) of the global total and Chevron Texaco, for example, Chevron by the way, is three point eighteen percent (3.18%) and then down the line. And in the recent press release that I have issued yesterday, I have updated this table to only look at twenty (20) of the largest investor-owned companies alone since I know that is the focus of the Commission's Inquiry with respect to carbon majors. So please refer to that for an update for those numbers to 2016.

So it matters a lot which periods of time with some of the largest carbon majors over their time. So in this chart here that goes from 1750 with the earliest dates being 1854 for a coal company in the US to 2016, Saudi Aramco leads the list. But if we look at just the last 1988 to 2015, Saudi Aramco again leads the top but followed now by Gazprom as opposed in the previous looking at Chevron. So the relative value of inputs from oil, and gas, and coal companies varied by the period of time that you're focused on and this is important for our modelling that I'll describe next. But let me just point out first that half of all industrial emissions of CO_2 have come since 1989 alone. So with colleagues, at Union of Concerned Scientists and the University of Oxford, we ran the results of the Carbon Majors, the major carbon producer's contribution to climate change and emissions, both from their products as well as their direct operational emissions, and modelled their impact on increase of CO_2 in the atmosphere and the radiative forcing that would result to higher concentrations of CO_2 as well as methane. And we looked at what that radiative change would result to in terms of increase in temperature, sea level surface temperature, as well as sea level rise itself. So in this first chart, we look at the CO_2 rise attributable to the largest twenty (20) or so companies and on the left hand side in the next three slides, we looked at the long period from 1880 to 2010 on the left; and from a shorter period of time where companies presumably were or should have been aware of the consequences of their products from 1880 to 2010 on the right.

And here, we have the same chart just focused on temperature rise attributable to the largest oil, gas, and coal companies from a longer period from 1880 on the left and the shorter period from 1980 on the right. And we know that a lot of the climate damages particularly the ones that are the focus of litigation in the United States focus on sea-level rise. So we have again estimated what the contribution is of each of the largest companies to global rise of sea level.

And in closing, I just want to suggest the very simplified view of where this work has started and aims to end up in terms of attributing potential liabilities to the largest oil, gas, and coal companies. But starting from their fossil fuel production for which they have declared to shareholders what their annual

production is and converting that into carbon emissions by accounting for non-energy uses. Again attributed to the production of each company and then estimating the atmospheric CO_2 increase, temperature response, and sea level rises which then eventually would drive climate damages and climate cause.

So in closing, I can't say it better than the Editorial Board of The Guardian. The onset of hurricane Irma heading towards Miami and Key West in Florida, by quoting their editorial of September 10, 2017… "Fossil fuel companies should be held accountable for the effects of climate change. Legal warfare has a two-fold aim: to overhaul transgressor's business models so that they are in line with the global commitment to phaseout fossil fuels and limit temperature rises to one point five degrees Celsius (1.5°C); and to get them to pay for damages resulting from global warming. Climate litigation is the inevitable result of a failure of two (2) decades of talks. But it is also an important way of reframing the climate crisis as a human rights emergency." Thank you so much.

PANEL CHAIR CADIZ:

Counsels…

ATTY. PAUDAC:

Thank you, Richard, for that very enlightening presentation, I just have a few questions, Your Honors, if I may be allowed to ask.

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

Yes. In your Statement, you mentioned, particularly page five (5) in answering question number seven (7), you mentioned that Royal Dutch Shell estimated in a 1988 confidential report which was published this year by Dutch Germany's that in 1984 its products contributed three point nine percent (3.9%) of the world's fossil fuel emissions. This estimate closely tracks the results of your own research. Now in your experience in continuing research that you are currently undertaking, do you think Shell and the other carbon major companies are currently transparent about their operational product-related emissions?

DR. HEEDE:

They are much more transparent, although perhaps incomplete particularly with methane emissions attributable to their operations, on scope, on direct operational emissions. They are much less uniform or transparent or complete in their estimates of emissions from their products. Their methodologies differ, some companies don't report at all, some companies more closely follow my methodology and many companies follow the methodology of estimating emissions from their products sold on global markets which often include crude oil and products that they have bought on the open market over the point first. My work is focused only on the emissions likely from their carbon fuels extracted from the ground. And their net productive capacity for each year.

ATTY. PAUDAC:

Okay. Thank you for that, Richard. Based on one of the papers that you co-authored, "The Climate Responsibilities of Industrial Carbon Producers" that is Exhibit "XXXX" to "XXXX-14," could you explain why it is important to consider the responsibilities of fossil fuel companies in addition to the responsibilities of nation-states?

DR. HEEDE:

We are focused on corporations because they have unique power in the marketplace, and management and engineers decide on capital investment for acquiring or finding and developing new reserves. Management decides overall strategy about how much money to invest and where to invest their money, and whether to invest in fossil fuels, whether to shift more to natural gas. Whether to invest in renewable or lower carbon fuels, it's up to the corporations and senior management about where and the scale of global emissions are made in the corporate management's suite than it is up to the nations that seeks to control emissions.

ATTY. PAUDAC:

Thank you, Richard. Last question: In this evaluation, did you find that there is a period of time when companies could have acted based on the scientific knowledge to reduce the risk of climate change on people such as Filipinos?

DR. HEEDE:

Well, I started researching and reading the climate literature in the early seventies when I was in undergraduate school. That became the focus of my work in graduate school in the eighties but I could discern from the literature then being published on climate change that it was going to be a very good, difficult, and large-scale, and one of the most significant issues facing humanity overall and that was from my undergraduate days. So if the oil and gas companies have read the same literature, they would have been forewarned as Mr. Muffett will present later on this afternoon. In fact, many of them have intimate knowledge about climate science. And so, there certainly was a time, if not in the sixties or perhaps even the seventies, if we excuse their long delay in acting. But by the eighties, the preponderance of the evidence was pretty clear that there was a problem with their products, and that their products would change the atmosphere, and temperature will rise and result in very difficult issues for humanity as a whole not only in the Philippines, but elsewhere in the world.

ATTY. PAUDAC:

Thank you, Richard. That will be all for us, unless you do have questions.

PANEL CHAIR CADIZ:

Thank you very much, Counsel and Mr. Witness.

Commissioner Armamento…

COMM. ARMAMENTO:

Good morning, Richard. I want to know how did you come up with the conclusion attributing specific accountability to a particular so-called Carbon Majors? How are you able to come up with that conclusion?

DR. HEEDE:

We estimated how much carbon in each product that they delivered to markets and had extracted from the ground. We estimated their emissions over their corporate history and compared those emissions. Take Chevron, for example, which over its more than a hundred-year history has contributed fifty-four billion (54,000,000,000) tons of carbon dioxide equivalence. Compare that to global industrial emissions from all fossil fuel and cement sources; that is a

little bit over three percent(3%) of the total of one point seven trillion (1,700,000,000) tons of carbon dioxide.

COMM. ARMAMENTO:

Thank you. May I ask another question? Are there other factors that may be considered other than the fossil fuel, the cement, which may be considered as also contributory to the worsening climate change?

DR. HEEDE:

As I mentioned, there are other sources of anthropogenic or human sources of greenhouse gases. There are landfills, for example, for methane. There are other sources of methane, landfills and cattle. There's nitrous oxide from fossil fuels mostly being burned in engines. There are chlorofluorocarbons and the replacement refrigerants that are also causing climate change but in terms of modelling, we want to just focus on the industrial sources itself because, in part, because there were no companies large enough in having cattle or deforesting lands for example that would account for eight million metric tons for its equivalent per year so we just focused on fossil fuel and cement companies.

COMM. ARMAMENTO:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Pimentel, your questions.

COMM. PIMENTEL-GANA:

Okay. Good morning. On the chart that you presented, I think it is number thirteen (13), when you were talking about the top six (6) Carbon Majors, their carbon dioxide and methane emissions in 1910 to 2013, the chart where you showed the emissions of Chevron, Saudi Aramco, ExxonMobile? Yeah, anyway, I was wondering because the chart of Chevron showed that in the 1970s there was high emission, but it went relatively down as the years went on and even that of ExxonMobile and BP U.K. So you think that since there was a significant drop in their emissions, was it a recognition of a responsibility on their part? As if something to do with climate change... that

today at that particular point they recognize that they were affecting the environment?

DR. HEEDE:

No. It was a rise of state-owned companies particularly through OPEC and taking possession of the oil reserves in Saudi Arabia, for example, on behalf of Saudi Aramco and pushing out the production, net production of the international oil companies that previously produced almost all the oil in Saudi Arabia. And similarly for other state-owned companies that were established in the 1970s. That's what basically drove down the annual production rates of the international oil companies.

COMM. PIMENTEL-GANA:

Oh, so what you are saying is that the Chevron drop was all because of the source of production?

DR. HEEDE:

Exactly.

COMM. PIMENTEL-GANA:

Because states took over the oil exploration, whatever, development?

DR. HEEDE:

Exactly. So now most of the oil in Saudi Arabia is on behalf of the national oil company, the Saudi Aramco oil company.

COMM. PIMENTEL-GANA:

So it has nothing to do with…

DR. HEEDE:

Nothing to do with recognition that their products are causing climate damages, no.

COMM. PIMENTEL-GANA:

Okay. Thank you.

PANEL CHAIR CADIZ:

Commissioner Karen Dumpit…

COMM. GOMEZ-DUMPIT:

Good morning.

DR. HEEDE:

Good morning.

COMM. GOMEZ-DUMPIT:

Just a follow-up on Comm. Gwen's question. If we're going to track back the production of oil and exploration, it hasn't really been going down. The production just shifted from private companies to state-run institutions.

DR. HEEDE:

As you can see on this chart here, global emissions are still plateauing now but they have not yet peaked demonstrably. They may go up next year. Well we have to wait for the next year's data but oil, gas, and coal emissions are all still rising.

COMM. GOMEZ-DUMPIT:

On the red…

DR. HEEDE:

But coal emissions may be on their way down now that there's global recognition that that is the worst fossil fuel to burn.

COMM. GOMEZ-DUMPIT:

In the studies that you conducted, let me just find the reference, you did the peer review process and from what I gather here, you said that there were no published industry challenges on the results of your studies. Did you actually reach out to the carbon majors regarding your study and did you actively seek their comments to it?

DR. HEEDE:

I did not. I have heard from their sources that many people in the companies have, and are aware of the study but they prefer to keep their comments to themselves and have not publicly challenged them. And I might add that I'm basing the emissions on corporate data supplied to their shareholders and using a robust peer-reviewed methodology to estimate how much of that production ends up in the atmosphere. Now there may be variables between companies and the accuracy of corporate data that they've always been welcomed to improve if they wish, but that result is basically unassailable in terms of how much they have contributed to atmospheric CO_2 concentration.

COMM. GOMEZ-DUMPIT:

And then just my last point, I'm just curious. If you count the bloviating bloggers, can you give me examples of the bloggers that just, you know, comment on your studies and perhaps we can take a look at them, if you have a list?

DR. HEEDE:

I don't have a list in my head except I remember a fellow by the name of Bishop. I can provide you with a list this afternoon if you like, but these are basically bloggers who have come across a publication following a conference at La Jolla, California in 2012 where colleagues of mine including Meeting of Concerned Scientist and many legal experts, experts from the tobacco industry and tobacco litigators, as well as climate scientists and climate lawyers. There was a small conference that was held in La Jolla to look at the potential legal liability and legal avenues by which major fossil fuel companies might be held liable down the road and they were concerned that that document, although it was made public as soon as the conference was over, basically established a conspiracy against the oil companies, which was at all not true, but as what they were stating in their blogs that they had found out the holy grail of why the Atty. General of New York for example and the Atty. General of Massachusetts were investigating ExxonMobil for potential fraud. They had

traced it back to some of the discussions we had at La Jolla on potential liability.

COMM. GOMEZ-DUMPIT:

Thank you very much, Mr. Heede.

PANEL CHAIR CADIZ:

Father Pedro? Sorry about that.

DR. WALPOLE:

Thank you very much… I feel you've clarified for us a number of points that were very helpful. In what you have said, a number of points come together so you're explaining the shift in relation to OPEC occurring around the 1980s, well between the seventies and eighties. Maybe the specific question is why is 1980 the chosen date for either charging from the beginning or allocating from the beginning, attributing from the beginning to the present time or from 1980 to the present time. Why 1980?

DR. HEEDE:

That's an important question and that might be debated by scientists for many years yet but we had to choose a date by which we could start a clock, as it were, on accountability for climate change because there were several scientific publications from the National Academy of Sciences, for example, that made the impact of fossil fuels a matter of public concern. So at that point there was no excuse for the oil, gas, and coal companies not to be aware. They certainly were aware many years earlier but in terms of established science being published by National Academies that was a pivotal point in the late seventies.

DR. WALPOLE:

Was it a particular paper or conference that really made that known?

DR. HEEDE:

Yes, and I don't recall a citation I'm happy to give it to you afterwards so you can take a look at that. I believe it was 1977 or 1978 by the National Academy of Sciences. And there were other papers published around the same time. I think the paper I am trying to think of is the Cheney Report in late seventies.

DR. WALPOLE:

Yes. Okay. Thank you.

DR. HEEDE:

May I just add one, one final note? I forgot to mention that all the carbon majors that I showed in the chart with the black and the red line, the total emissions from industrial sources over that period of time was one point seven trillion (1,700,000,000) tons of CO_2 and equivalent with methane and the carbon majors account for sixty-six point seven percent (66.7%) of all those emissions over time, one point one trillion (1,100,000,000) tons of carbon dioxide equivalent.

COMM. PIMENTEL-GANA:

How much percentage in there to the others?

DR. HEEDE:

There are many other companies that do not make my thresholds. Smaller oil and gas companies, coal companies that have gone out of business – their assets have dispersed, so we accounted for two-thirds of it and the rest is, well, I might pick up on smaller companies over the next couple of years to see which companies have now risen to meet the threshold. Some Australian and German companies for example, might now meet the threshold so I might be higher than two-thirds in the years to come.

PANEL CHAIR CADIZ:

I will now be asking questions.

Well, first of all, thank you very much, Mr. Heede, for coming here…

DR. HEEDE:

Thank you, Mr. Cadiz.

PANEL CHAIR CADIZ:

…before our commission to testify on the subject that you have just spoken on.

You are now the Executive Director of the Climate Accountability Institute… may I know when was this institute founded?

DR. HEEDE:

In September 2011, with my colleague Naomi Oreskes.

PANEL CHAIR CADIZ:

And how big is this institute? How many members do you have?

DR. HEEDE:

Your Honor, it's a very small institute. It is basically, I am the only staff person. I have a very respected Board but I have decided to keep my research close to the vest as it were and conduct all of the research except for the occasion when I need a research assistant. But we haven't thought to expand beyond my sole contribution and that of my colleagues on and off the board.

PANEL CHAIR CADIZ:

Alright. So this was largely a solo project on your part with assistance here and there.

DR. HEEDE:

Crucial assistance, I might add from Naomi Oreskes' important work and merchants of doubt and following work on holding corporations accountable not only for climate change but also for asbestos, and DDT, and tobacco, etcetera.

PANEL CHAIR CADIZ:

So, the period covered by your studies from 18… again, could you… from the 18…

DR. HEEDE:

Eighteen fifty-four (1854) is the oldest record for Westmoreland Coal based in the United States.

COMM. CADIZ:

So, your first data was from 1850s up to 19…

DR. HEEDE:

I've just updated to 2016 and I'll be updating it every year going forward.

PANEL CHAIR CADIZ:

But the… alright. Okay. And how long did it take you to finish this study?

DR. HEEDE:

Many years. I have to read thousands of annual reports. Many of which are fairly inaccessible. You have to go to uncatalogued collections and dusty basements all around the world. I had colleagues who would gather annual reports for me. And I started this work with as we mentioned, Standard Oil with ExxonMobil in 2003, expanded the project in 2005, and I spent nine years or so collecting and analyzing data. But I want to realize the extent possible on corporate published reports and their Ten K reports to SCC or to annual reports to shareholders or lacking that data corporate histories. The largest oil and gas companies have published histories of their activities and their locations and oftentimes I would find production data in those corporate histories.

PANEL CHAIR CADIZ:

So when did you start the study? What year?

DR. HEEDE:

Subsequent to the Standard Oil through the ExxonMobil study we picked it up again in about 2006. I believe I worked parttime until 2010. We established Climate Accountability Institute in 2011, which then slowly attracted foundation funding to complete the work as well as funding from the Greenpeace International to help us get across the finish line of both peer-review and finishing the study. I work mostly on my own still, but thankfully I have lots of colleagues who could review the methodology and the results with me.

PANEL CHAIR CADIZ:

So, your study consisted of a total of how many years…? Because you earlier mentioned there was a gap where you stopped the…

DR. HEEDE:

I could say a thousand hours a year for twelve (12) years.

PANEL CHAIR CADIZ:

Alright. Twelve years, a thousand hours a year. Alright. Thank you.

Prior to this research project, did you engage in any other scientific research?

DR. HEEDE:

I engaged and worked at a place called Rocky Mountain Institute that was focused on understanding how we can save energy and water and other resources cheaper than getting new supplies, and led by Amory and Hunter Lovins. So that was another non-profit research institute with three (3) staff when I joined and probably a hundred (100) staff now. But I left in 2002 to do work on inventory in corporate and municipal inventories for my private clients through a consultancy. And that's how I met the originators of the Climate Justice program who commissioned me to start with the Standard Oil through ExxonMobil study.

PANEL CHAIR CADIZ:

So, you were commissioned by the Climate Justice Program.

DR. HEEDE:

That's right.

PANEL CHAIR CADIZ:

And were there other organizations who funded your research?

DR. HEEDE:

Early on for that study, Friends of the Earth-UK, I think, helped fund some of the study. There was a Norwegian foundation called Minor Foundation for Major Challenges that put up most of the money. So it's mostly foundation driven but other environmental organizations were also interested in the results.

PANEL CHAIR CADIZ:

Was Greenpeace involved in funding this project?

DR. HEEDE:

In those days no. That came later on in 2012 and 2013 when I had approached Greenpeace to see if they were interested in helping to conclude the study and it ended up in their legal department. They realized that there was some traction that we have and helped me fund and identify expert reviewers of the methodology.

PANEL CHAIR CADIZ:

So, the Climate Accountability… you did this research under the umbrella of the Climate Accountability Institute?

DR. HEEDE:

I finished it under the umbrella of the Climate…

PANEL CHAIR CADIZ:

You finished it. And there were funds provided to you by Greenpeace before this project was concluded?

DR. HEEDE:

Very, very modest funds. My funding these days is from private foundations in the United States.

PANEL CHAIR CADIZ:

And you earlier stated that it was you who approached the Greenpeace for funding?

DR. HEEDE:

Well, they have become aware of the work through other channels and I forget if I approached first or they sent me an email first but nonetheless they seem to be interested in exploring the possibility of completing the work because I didn't have enough foundation funding to put in enough time near the end of my consulting days to finish the work. So it needed some funding from Greenpeace and from Climate Justice.

PANEL CHAIR CADIZ:

And after this research project of yours was completed, it was published in 2014, am I…

DR. HEEDE:

Twenty fourteen (2014) with an online edition published three (3) months earlier.

PANEL CHAIR CADIZ:

Alright. And so, you are referring to this document… Counsels, please correct me if I'm mistaken… marked as Exhibit UUUU, this is the document that we are talking about. Can you show it to the witness?

DR. HEEDE:

Correct.

PANEL CHAIR CADIZ:

...consisting of 104 pages, and basically this research project of yours is the mother document on which are based the other exhibits, the press releases, the PowerPoint presentation, et cetera. Most of these others…

DR. HEEDE:

As I said there's a lot of follow-on work, but yes, this is the explication in great detail about the methodology, the sources of data, I had unlimited pages to describe where I get the data, where the emissions factors come from, what the range of estimates are, for example for methane released from coal mining. And I would canvas international sources from U.N., International Energy Agency, and other recognized sources and that has all explained about how I derive emissions factors, how I do estimate, how much natural gas, oil and gas companies use on their own accounts to run refineries and pipelines and sources of data on actual production by company and by coal rank, for example, and for cement.

PANEL CHAIR CADIZ:

Excuse me, Mr. Witness.

I just noted that you earlier mentioned that prior to the publication… was it prior or after the publication when this work was subjected to anonymous peer reviewers… review process?

DR. HEEDE:

I started writing the methods and results report prior to drafting the scientific paper in Climate Change that was subject to anonymous review by experts in the field.

PANEL CHAIR CADIZ:

How do you know these people who reviewed your work were experts if they were anonymous?

DR. HEEDE:

It's not up to me to choose the expert reviewers. It's up to the editorial editor of the journal. Climatic Change is a highly valuable pre-eminent publication in Climatic Change founded in the eighties I think by Stephen Schneider and is a well-recognized source of quality information. And their normal process would be to find reviewers in the field who had the expertise to review the methodology I used in the paper itself.

PANEL CHAIR CADIZ:

But I have to understand why reviewers would choose to be anonymous or would be held to be anonymous.

DR. HEEDE:

Oh, it's a normal peer review process in a professional journal that reviewers aren't voluntarily anonymous. It's by rule that the author should not know who the reviewers are so that there are no back-channel communications. It's done anonymously. I take their advice as experts. I make the changes that if I agree with them; I suggest and then resubmit after my revision to the editor of the journal who then decides if I made sufficient changes based on expert review comments to warrant publication.

PANEL CHAIR CADIZ:

So, the review process by anonymous reviewers happens before they were published, or after they were published?

DR. HEEDE:

Oh no, that was done as a process of submitting the paper, having it reviewed, and then accepted by the journal. So that's a many months process usually of having anonymous reviews and this is normal in the scientific literature to not know who the reviewers are but you have faith in the expertise of the editor that they find reviewers that have the expertise so that you are assured that the quality of the information that's been published is relatively unassailable.

PANEL CHAIR CADIZ:

So the review process happened as you were finishing the research project?

DR. HEEDE:

The data was in, I was drafting the scientific paper. This report was, I think published late Summer of 2013, maybe early Fall. So that was put to bed earlier on during the review process at the Climatic Change for the scientific paper. So this report came first and then I drafted the scientific paper concurrently; but then the peer-review process took several months after that and was accepted in August or so of 2013 and published online in September 2013.

PANEL CHAIR CADIZ:

So, you finished a first draft of your work… your research. It was given to anonymous reviewers... you considered their inputs, their opinions, and then you revised your research, after which, it was published.

DR. HEEDE:

It's worth mentioning that the expert reviewers made comments on the flow of the texts, they would suggest you need to explain the methodology in some better detail, they might challenge a few words here and there, but there was not a wholesale revision of the methodology or the results themselves.

PANEL CHAIR CADIZ:

Alright. So, the peer review was more in regard to technical editing as to the language, et cetera, so that perhaps it might be more understandable to the readers of the scientific journal?

DR. HEEDE:

No, I would say it's more than that. They would also have comments on assessing the certainty for example, about the estimates so that I could explain that into more detail in the scientific paper – what are the sources of uncertainty and how I have dealt to minimize them.

So it's more than a technical language edit. These are experts in the field of estimating emissions from energy sources, for example. I don't know who these reviewers are and I can't reflect on what their expertise is or verify that. That's how it normally goes and I'm an expert reviewer myself for several journals based on my own expertise.

PANEL CHAIR CADIZ:

So, you're saying that this research project of yours after… even after it was published, the anonymous reviewers have not been made known to you? Until this day?

DR. HEEDE:

Oh no, I don't know who they are.

PANEL CHAIR CADIZ:

Up to now, you don't know?

DR. HEEDE:

But it's worth saying that nobody has come to me either as an industry source or an academic expert saying there are problems with your paper. They haven't approached me privately. They haven't published any challenges or critiques of the paper itself.

PANEL CHAIR CADIZ:

How were their opinions, their findings, their recommendations relayed to you? Who relayed these feedback from the peer reviewers to you?

DR. HEEDE:

That's handled by the journal's editor in charge of this particular publication. When a scientific paper comes in for a review and is preliminary accepted by an editor, the senior editor would choose a junior editor to run the process. And I would know the name of the editor at Climatic Change, but I wouldn't know who you might have contacted to review the paper.

PANEL CHAIR CADIZ:

And are these editors, who are relaying to you the feedback from the anonymous peer reviewers, scientists or are they ordinary…?

DR. HEEDE:

In my case, yes.

PANEL CHAIR CADIZ:

They were scientists.

DR. HEEDE:

Yes. In my case, he was a university researcher in a University in Canada.

PANEL CHAIR CADIZ:

And you're saying that this process of subjecting a scientific work to anonymous reviewers is standard practice in…

DR. HEEDE:

Very standard practice in order to protect the integrity of the work and integrity of the process.

PANEL CHAIR CADIZ:

And you're saying that up to now, there has been no reputable group or science group that has assailed your scientific findings?

DR. HEEDE:

That is correct. And in several of my publications I have said that if industry wishes to improve my data set or my methodology that they should come forward and submit new data to replace my data set or to improve it. And to date, no one has come forward to do so.

PANEL CHAIR CADIZ:

You were discussing earlier the ratio between the emissions of the Carbon Majors to what you termed as the global industrial emissions. How were you able to determine the total global industrial emissions?

DR. HEEDE:

Fortunately, there has been extensive work done at several labs, but one in particular at the Oak Ridge National Laboratory in Tennessee in the United States that has created a database of fossil fuel production and their emissions around the world as I do oil, coal, natural gas, flaring, and cement. And the record for coal production and emissions runs back to 1751 mostly in the U.K. and elsewhere and later on in Europe, followed by a crude oil production starting in 1860s, I believe, and natural gas several years later, and cement in the early 19th century. So they have themselves, on a global basis looked at how much resource was extracted and much like my methodology estimated how much of that carbon has ended up in the atmosphere on an annual basis. So I've taken that whole data string of fossil fuel emissions since 1751 added it up to 2016 and as I said it's about one pont seven trillion(1,700,000,000) tons in aggregate; most of which since 1989, half of which was 1989.

PANEL CHAIR CADIZ:

You stated earlier… you were talking earlier about anthropogenic causes to climate change and implied there are also natural causes to climate change. If you were to put a ratio between the two causes, anthropogenic and natural, what ratio would the anthropogenic… versus the natural cause? Out of a hundred percent, how much would be anthropogenic?

DR. HEEDE:

I believe that the current research would put it above eighty percent (80%), perhaps even above ninety percent (90%) if you account for volcanic activity, solar variability, and other non-human causes.

PANEL CHAIR CADIZ:

Eighty… Yes.

DR. HEEDE:

That's not my expertise, but that's what I remember reading.

PANEL CHAIR CADIZ:

So, you're estimating that 80 to 90 percent of the causes of climate change is anthropogenic or natural?

DR. HEEDE:

Anthropogenic.

PANEL CHAIR CADIZ:

Anthropogenic.

DR. HEEDE:

Yes.

PANEL CHAIR CADIZ:

Natural cause is just between ten (10) to twenty percent (20%).

DR. HEEDE:

That's correct.

PANEL CHAIR CADIZ:

Has that, is that…?

DR. HEEDE:

I'm happy to provide citations and the scientific literature about what that is. Hopefully I'm not off that range, but that's what I recall reading, and I'm happy to provide documentation of that.

PANEL CHAIR CADIZ:

How are you able to determine that? I mean, that estimate?

MR. HEEDE:

How were the scientists able to determine that?

PANEL CHAIR CADIZ:

Only ten (10) to twenty percent (20%) of climate change is due to natural causes.

DR. HEEDE:

They would model recent volcanic activity, they would understand the atmospheric physics involved about how much cooling has been contributed by the volcanic activity versus previous periods. They know the strengths of the anthropogenic emissions and understand that physics quite well. They understand that solar variability has an impact but it's been deemed to be relatively minor in the overall scheme of climate change, at least, currently. And these people understand atmospheric physics more than I do and have determined that the largest proportion by far is a human input of fossil fuels and other sources such as deforestation.

PANEL CHAIR CADIZ:

I was just curious, because last night I was reading through other materials and I sense a hesitancy on the part of some reputable scientists to go into the field of attribution. Where does their hesitance come from? …that they stopped short of attributing climate change to anthropogenic or natural causes. They just refuse to delve in that area of climate science.

DR. HEEDE:

I assume you don't mean industry scientist on behalf of oil and gas and coal companies. They would have a natural reason to avoid making those calculations.

PANEL CHAIR CADIZ:

So are you, are…?

DR. HEEDE:

But scientific… free scientists are able to express their expertise and they have determined based on their knowledge that the major impact is from fossil fuels.

PANEL CHAIR CADIZ:

And this…

DR. HEEDE:

And there are a lot of skeptics that would deny that, would deny that science. A few anyway, but by and large those skeptics when they are able to publish a scientific paper are often reputed.

PANEL CHAIR CADIZ:

Are you saying that there is a general consensus among climate scientists and… I don't know what field of science…?

DR. HEEDE:

That is exactly what I am saying. It's that the vast preponderance of academic and professional experts in climate science agree that climate change is human-caused.

PANEL CHAIR CADIZ:

…is anthropogenic.

Other scientists under the employ of, let's say, the Carbon Majors?

DR. HEEDE:

I don't want to characterize industry scientists as dishonest but there have been cases where the industry has funded other research groups in order to highlight the contribution falsely in my mind about the impact of solar variability for example "It's all up to the sun, it's not anthropogenic." I think that's false.

PANEL CHAIR CADIZ:

You don't have to answer this. I'm just curious… What is the opinion or the position of Doctor James Hansen? I'm sure you are familiar with him.

DR. HEEDE:

I am familiar with him.

PANEL CHAIR CADIZ:

Regarding the science of, or the issue of attribution of causes of climate change?

DR. HEEDE:

He has been convinced since before his testimony before the U.S. Senate in June of 1988, that we were then detecting a human fingerprint on climate and he's been proven right.

PANEL CHAIR CADIZ:

And that he's also saying that the major cause of climate change is anthropogenic.

DR. HEEDE:

Like ninety-nine percent (99%), I think, of world's climate scientists agree with that statement.

PANEL CHAIR CADIZ:

Alright. I have no further questions. Maybe the other Commissioners would like to follow-up?

Thank you very much, Mr. Heede, for taking your time out to testify before this Commission.

DR. HEEDE:

Thank you, Mr. Cadiz. Thank you, Commissioners.

ATTY. PAUDAC:

Your Honor, may the witness be excused?

PANEL CHAIR CADIZ:

Yes, of course.

Attorney Fernandez, what happens now? Do we break out to lunch?

CLERK OF THE INQUIRY:

Yes, Your Honor. And also, we are requesting everybody to sign the registration sheet in front of the session hall.

PANEL CHAIR CADIZ:

So how… so we take a one-hour break for lunch and then we come back at 1:30 to resume…

CLERK OF THE INQUIRY:

Yes sir, we come back at one thirty (1:30).

PANEL CHAIR CADIZ:

Alright. The session is suspended. Thank you very much. We will return at 1:30.

[Bangs gavel]

[Lunch break]

CLERK OF THE INQUIRY:

All rise.

The Honorable Inquiry Panel Chairman Comm. Roberto Eugenio T. Cadiz still presiding.Everyone may be seated.

PANEL CHAIR CADIZ:

[Bangs gavel]

The Panel is now in session.

Counsels, you may now proceed with your next witness.

ATTY. MAYO-ANDA:

Good afternoon, Your Honors. Our next witnesses are Mr. Elicer Lauce and Mrs. Delia Tulagan, both from Capalonga, Camarines Norte.

MR. ELICER G. LAUCE:

Ako si (I am) Elicer G. Lauce, *taga-* (from) Capalonga, Filipino.

MRS. DELIA TULAGAN:

My name is Delia Tulagan from Capalonga, Camarines Norte.

ATTY. MAYO-ANDA:

So to proceed, Your Honors, Mr. Elicer Lauce is a farmer and fisherfolk from Barangay San Isidro of Capalonga, Camarines Norte, while Mrs. Delia Tulagan is a farmer and also a barangay official from Barangay Tanawan, Capalonga, Camarines Norte. And we are offering them as witnesses and resource persons to enable them to share their experiences on intense heat and weather events and the impact on their lives and livelihood as farmers and fisherfolks in Capalonga, Camarines Norte. May I proceed, Your Honor, to ask them questions related to documents?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

Magandang hapon po, Ginoong Elicer Lauce at Ginang Delia. Mayroon po akong gustong ipakita sa inyo na mga dokumento. Ito pong unang dokumento na nagngangalang "Salaysay ni Ginoong Elicer Lauce" na may apat (4) *na pahina. Nakikilala niyo po ba ito, Ginoong Lauce?*

(Good afternoon. Mr. Elicer Lauce and Mrs. Delia. I would like to show you some documents. This document named "Statement of Mr. Elicer Lauce" that has four (4) pages, can you recognize this, Mr. Lauce?)

MR. LAUCE:

Opo. (Yes.)

ATTY. MAYO-ANDA:

Salamat po. Sa pang-apat po na pahina ng dokumentong ito, mayroon pong pirma dito. Kaninong pirma po ito? (Thank you. In the fourth page of this document, there is a signature. Whose signature is this?)

MR. LAUCE:

Sa akin po iyan. (That is mine.)

ATTY. MAYO-ANDA:

Salamat po. Dito naman po sa dokumentong "Salaysay ni Ginang Delia Tulagan,*" may tatlong* (3) *pahina po. Puwede ninyo pong tignan, Ginang* Tulagan*kung makikilala ninyo po 'yang dokumentong iyan?*

(Thank you. In this document "Statement of Mrs. Delia Tulagan," there's three (3) pages. Can you take a look, Mrs. Tulagan, if you can recognize that document?")

MRS. TULAGAN:

Sa akin po ito. (This is mine.)

ATTY. MAYO-ANDA:

At *sa pangatlong pahina ng dokumento, ay may pirma po. Kaninong pirma po ito?* And on the third page of the document, there is a signature. Whose signature is this?)

PANEL CHAIR CADIZ:

Paki-lakasan. (Kindly speak louder.)

MRS. TULAGAN:

Pirma ko po iyan. (That is my signature.)

ATTY. MAYO-ANDA:

May problema sa sounds. Dito na lang po. (There is a problem in the sound system. Please use this instead.)

MRS. TULAGAN:

Pirma ko po iyan. (That is my signature.)

ATTY. MAYO-ANDA:

Ginang Delia Tulagan, kanina po, tinawag niyo po iyong attention*ko sa page three (3), question twelve (12). Binanggit niyo na mayroon pong kailangang baguhin dito. Puwede po ninyong tingnan muli?*

(Mrs. Delia Tulagan, you called my attention earlier regarding page three (3), question twelve (12). You mentioned that there is a need to change something here. Can you please take a look at it again?)

MRS. TULAGAN:

Mayroon po. (There is.)

ATTY. MAYO-ANDA:

Ano po dapat iyon? (What should it be?)

MRS. TULAGAN:

Ito pong twenty-five percent (25%) *dapat palitan po ng*ninety-five percent (95%) *dahil totally damaged po kami noong bagyong Rosing.* (This twenty-five percent (25%) should be changed to ninety-five percent (95%) because we were totally damaged by the storm Rosing.)

ATTY. MAYO-ANDA:

Your Honor, please, before I have it offered, but this is pre-marked, we would like to apologize, and also respectfully request that the answer to question twelve (12) in page three (3) be changed to ninety-five percent (95%) as she has manifested that it is not twenty-five percent (25%) but ninety-five percent(95%), Your Honors.

PANEL CHAIR CADIZ:

So she is correcting an entry or a statement in her affidavit?

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Alright, duly noted. Can you make the correction now and sign it?

ATTY. MAYO-ANDA:

Yes.

PANEL CHAIR CADIZ:

That is Exhibit…CCCCC.

ATTY. MAYO-ANDA:

Yes, "CCCCC."

PANEL CHAIR CADIZ:

Alright.

ATTY. MAYO-ANDA:

These documents have been pre-marked, Your Honors, on August 22, 2018. The "*Salaysay* (Statement) of Mr. Elicer Lauce" pre-marked as "BBBBB" until "BBBBB-3," the "*Salaysay* (Statement) of Delia Tulagan" pre-marked as "CCCCC" to "CCCCC-2." Atty. Martin, can you confirm the pre-marking? Thank you, Your Honor. Can we now respectfully ask the witnesses, Your Honor, to present?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

Ginoong Elicer, puwede na po kayong magsimula. (Mr. Elicer, you may now start.)

MR. LAUCE:

Magandang hapon po sa lahat. Ako po si Elicer G. Lauce, fifty-three (53) years old, mayroon pong anim (6)na anak, tatlo (3) po ay nakatapos na ng kolehiyo, at tatlo (3) po ay kasalukuyan pong nag-aaral. Ang magulang ko pong lalaki ay taga-Paracale, Camarines Norte at ang akin pong nanay ay taga-Capalonga.

(Good afternoon, everyone. I am Elicer G. Lauce, fifty-three (53) years old, I have six (6) children. Three (3) of them graduated from college while three

(3) are still studying. My father is from Paracale, Camarines Norte and my mother is from Capalonga.)

Bale doon ko na po nakagisnan iyong pagsasaka, at doon na ako halos lumaki. Sa edad na sampung (10) taong gulang, nakatutulong na po ako sa pagtatanim ng palay at ng mga gulayin, at sa pangingisda. Wala pong problema noong mga 1970s-1980s kasi doon po sa aming lugar ay sagana pa ang lamang-dagat. At maging sa pagkain, mga prutas at palay ay sagana pa ho. Subalit nito hong dumating na ang mga late 1990s hanggang 2000 ay marami hong pagbabago.

(I grew up with farming. When I was ten (10) years old, I already helped in planting rice and vegetables, and in catching fish. There was no problem in the 1970s to 1980s because we have abundant marine life in our place. When it came to food, fruits and rice grains were abundant. But during the late 1990s until 2000s, there was a great deal of changes.)

Sa karagatan ho kapag nangingisda kami noong mga 1970s-1980s, minsan po sa loob ng tatlong oras nakahuhuli na kami ng mga pitong (7) kilo. Pero nitong mga year 2000 na ho, pakunti na ng pakunti at paliit na po ng paliit ang mga klase ng isda na aming nahuhuli. Kaya nagkaroon ho kami ng kaisipan na gumawa ng ibang pamamaraan. Naglalagay po kami ng payao doon sa laot kung saan lumalayo na ho kami sa tabi para po maggawa kami ng sanctuary, iyong pabahay ng isda, upang sya naming pagkukunan po ng isda. At sa niyugan naman po noon ay napakarami pong bunga ang aming niyog at marami pa siyang puno. Pero po nitong pagpasok ng 1990s hanggang 2000s marami na po ang mga nagkasakit na niyog. Iyon po ang tinatawag na kadang-kadang at saka po may mga Brontispa. At sa ibang lugar ay mayroon din po iyong cocolisap. Kaya't napakarami na pong naputol na niyog dahil nagkasakit ng kadang-kadang. Iyon pong naninilaw ang puno, ang mga dahon, hanggang sa mamatay.

(When we were fishing in the ocean from the seventies to the eighties, we'd catch seven kilos within less than three hours. But lately, in the years 2000, there is a decreasing volume and sizes of the varieties of fishes we are getting. That is why we had an idea to create other strategies. We placed *payao* fish aggregating devices in the sea, wherein we go far from shorelines so that we can create a sanctuary–the habitats of fishes so that there would be sources of fish. In our coconut fields, on the other hand, we have lots of coconuts and other trees, as well before. But now, when 1990s until 2000s came, lots of coconuts were struck by diseases. There is what we call *kadang-kadang* (coconut scale insect disease), and aside from that, there are Brontispa. In other places, there are cocolisap. This is the reason why lots of coconut trees were cut down because of the *kadang-kadang* disease where trees and leaves turn yellow and eventually die.)

Sa palayan naman po, dahil mayroon din kaming binubukid na almost nine thousand square meters (9,000 sq.m).., noong mga 1970s to1980 s, umaani ho ito ng seventy (70) to eighty(80) cavans. Pero iyong mgafifty (50) cavans po ay nagiging kapital namin sa pagbubukid sapagkat wala kaming puhunan. Pero nitong bandang huli po dahil sa matinding sikat ng araw at init, mga sixty (60) cavans na lang po ang naha-harvest namin so iyon pong natitira babawasan ng kapital. Pero hindi po siya laging puwede kang mag-ani sapagkat ang pagtatanim ay parang pakikipagsugal din iyan. May panahon na hindi ka rin nakaaani kapag inabot ka ng baha at ng sobrang init.

(In our rice fields, since we are also farming almost nine thousand square meters(9,000 sq. m.), during 1970s to 1980s, we were able to harvest seventy (70) to eighty(80) cavans. The fifty (50) cavans are being used as capital because we don't have investment money. Lately, because of the intense heat of the sun, we are only harvesting sixty (60) cavans. That is why we just deduct the capital from the remaining ones. But you cannot always harvest because farming is like a gamble. There would be seasons wherein you can't harvest due to flood or extreme heat.)

Sa pagkain po, tulad ng nasabi kanina, sagana po kami noon. At iyong aming inuming tubig ay galing sa bukal. Pero nito pong bandang huli, ay unti-unting kumakaunti ang tubig sa bukal at hanggang sa ngayon po ay napakahirap na po ng tubig sa aming barangay at maski doon po sa aming bayan.

(The food was abundant, as I mentioned earlier, we had plenty of it. Our drinking water is from the springs. But lately the water in the springs is slowly decreasing. Now, it is very hard to acquire water in our village and even in our town.)

Ang epekto po nito sa aking mga anak… kasi po tinatanong ko sila kung gusto pa nilang magsaka katulad ko, pero ayaw na po nila. Ang katunayan po, iyong aking ika-apat na anak, bale noong siya'y first year college ang course niya ay Agri-Business. Pero noong mag-second yearna po siya, nagbago ho siya, nag-iba na po siya ng course. Ano na lang, Secondary Education.

(The effect of this on my childen: I was asking them if they want to become a farmer just like me. But they did not like it. In fact, my fourth child who was already in first year college taking Agri-Business shifted to Secondary Education when he enrolled in second year.)

So noong 2013 po, doon sa aming barangay ay nagkaisa kami na bumuo ng isang samahan, Samahan ng Magsasaka at Mangingisda ng Barangay San Isidro (SAMMABSI), at ako ho ang naging pangulo nito hanggang sa kasalukuyan. Kaya ho kami nagtatag nito para makahingi kami ng suporta saDOLE at sa Department of Agriculture. At nag-venture din po kami sa

ibang hanapbuhay katulad po ng coco coir production at mayroon po kami noon sa Capalonga.

(So in 2013, we united to form an organization in our barangay, the *Samahan ng Magsasaka at Mangingisda ng* (Union of Farmers and Fisherfolks of) Barangay San Isidro, so we could ask support from DOLE and Department of Agriculture. I became its president. We ventured in other livelihoods like coco coir production, and we have that in Capalonga.)

Marami ho sa mga taga-Capalonga ang registered fisherfolk, almost one thousand seven hundred (1,700) na halos. Pare-pareho ang hinaing namin – ang pagliit po ng kita. At dagdag ko pa po, noong lumaki na po ang aking mga anak, noong matapos na po ang grade 6, naglipat na ho kami ng ibang bayan. Kasi doon po sa aming bayan noong panahon na iyon ay walang public highschool. Gusto kong makatapos sila ng pag-aaral kaya lumipat kami sa Camarines Sur, doon sa lugar ng aming bayan dahil doon ho ay mayroong public highschool.

(Many residents of Capalonga are registered fisherfolk, almost one thousand seven hundred (1,700), who all lament the reduction of our incomes. When my children grew older, we transferred to another town after they graduated from Grade 6 because there was no public highschool in our town during that time. I wanted them to finish their studies so we transferred to Camarines Sur. In our place there is a public highschool.)

At ako po ay nagpapasalamat sa Panginoong Diyos at sa lahat po ng sumusuporta sa akin para po makarating dito upang marinig po ninyo ang hinaing at mga nangyayari sa aming bayan lalo na sa maliliit na mangingisda at magsasaka.

(And I am also grateful to God and to all who supported me for the opportunity to be here, to express our plight and to talk about what's happening, especially to small fisherfolk and farmers in our town.)

Iyon lang po. Bagama't ito pong ginagawa namin ay parang suntok sa buwan, parang suma-salansan ka sa malaking agos, parang walang katiyakan ang kapanalunan, ano po? Pero umaasa pa rin po kami na sa tulong po ng ating Commissioners at ng mga naniniwala sa pagbabago, ang climate justice ay magtatagumpay. Salamat po.

(That's all. We are like shooting the moon or like swimming against the strong tide, with little chance of winning. But with the help of our Commissioners, we still hope we will have climate justice. Thank you.)

ATTY. MAYO-ANDA:

Salamat, Ginoong Elicer. Ngayon po, Ma'am Delia puwede na po kayong magsimula. (Thank you, Mr. Elicer. Ma'am Delia, you may now start.)

MRS. TULAGAN:

Magandang hapon po sa lahat. Ako po si Delia Tulagan, limangpo at pitong (57) taong gulang, may tatlong (3) anak, dalawang (2) nakatapos ng highschool at isang (1) nakatapos ng college. Iyong bunso ay nasasecondary education na. Isa rin po ako ngayon sa nakikipaglaban sa climate change. Nakikipaglaban ang aming buhay, iyong aming mga pananim.

(Good afternoon to everyone. I am Delia Tulagan, fifty-seven (57)-years old with three (3) chidren. Two (2) of them are highschool graduates, and the other one (1) is a college graduate. My youngest is pursuing secondary education. I am also one of those who are fighting against climate change. Our lives, our crops are fighting.)

Noong 1970, noong kabataan ko po, ako po ay naglayas sa aking magulang dahil masungit po ang aking lola. Nakitira po ako sa aking tiyahin na isa ring magsasaka. Noong mga panahon pong iyon, ako po ay binabayaran niya ng seventy-five (75) centavos sa maghapon para gastusin ko naman po sa aking mga pangangailangan.

(In 1970, in my younger days, I ran away from my family because my grandmother was irascible. I stayed with my aunt who is also a farmer. And during that time, she gave me seventy-five (75) centavos for the entire day, which I used to purchase my necessities.)

Noon pong 1976, umalis na ako sa aking tiyahin. Pinaalis po niya ako sapagkat nagdadalaga na at nililigawan na raw po ako. Para wala na raw po siyang pananagutan sa akin at baka ako ay biglang mag-asawa. Kaya 1976 po, nakasal po ako noon. Iyong napangasawa ko noon... isa rin palang magsasaka iyong pupuntahan ko. Tapos noong 1976, binigyan naman po kami ng tatlong (3) ektaryang lupa na may tanim po na niyog at mayroon din pong danaw na ibinigay na rin po sa amin.

(In 1976, I left the house of my aunt. She sent me away because I was already an adolescent and boys were courting me already. She would not like to take any responsibility in case I get married all of a sudden. I got married in 1976. I was not expecting that I would end up marrying a farmer as well. That same year, we were given three hectares (3 ha) of land with coconuts and a rice field.)

Noon pong 1979 hanggang mga 1986 ganyan, magandang-maganda pa po ang ani namin ng palay at ang mga niyog namin ay napakatataba pa. Hindi po kami gumagamit ng fertilizers sa danaw. Hindi rin po kami gumagamit ng mga lason na pang-spray sa danaw.

(In 1979 until 1980-86, we had a good harvestof rice and our coconuts had thick meat. We did not use fertilizers and we did not also spray insecticides to the rice field.)

Noong mga 1980 na hanggang 90, bigla pong nagbago ang klima. Ang nangyari na sa danaw namin, ginagamitan na po namin siya ng pataba pero hindi pa rin siya gumaganda sa kadahilanang ang aming tubig ay kakaunti na lang po ang nadaloy sa danaw namin. Tapos kapag dumating naman po iyong ulan, sobrang lakas naman po. Nawawadwad naman ang aming danaw. Wala na rin naman po kaming kinikita. Tapos pag minsang tag-init, wala pa rin. So totally po noong mga panahon na iyon, hanggang ngayon wala na po kaming danaw. Sa ngayon, totally walang-wala na po talaga dahil sa tagtuyot po. Iyon lang po.

(In 1980 until 90, there was an abrupt change of climate. Our rice field were not improving even with fertilizers because the water that flows to our rice field has lessened. And when the rain came, it was a downpour. Our rice field became bare. We were not earning anything. Even in sunny days, we still do not get anything. So totally, from that time until now, we do not have our rice field anymore. As of now, totally, we have really nothing at all because of drought. That is all.)

ATTY. MAYO-ANDA:

Salamat po Ginang Dalia. (Thank you, Mrs. Dalia.) Your Honors, can I ask questions?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

Unahin ko muna po si Ginoong Elicer. Salamat po. Binanggit ninyo po kanina iyong kadang-kadang na sakit po ng niyog. Sa palagay po ninyo, sa karanasan niyo, bakit po nangyayari iyon?

(I will ask Mr. Elicer first. Thank you. You mentioned a while ago about the kadang-kadang and the disease of the coconut. In your opinion and in your own experience, why is it happening?)

MR. LAUCE:

Sa palagay ko po dahil sa matinding init. Kasi po namamatay iyong kanilang dahon hanggang sa pumula at mauubos po hanggang sa mamatay po iyong dahon. Iyon po. (In my opinion, it was because of the intense heat. The leaves are dying until all fall off. That's it.)

ATTY. MAYO-ANDA:

At hanggang ngayon po ba, 'yong inyong mga niyog, nakararanas pa rin po ba ng ganoong sakit? (Your coconuts, are they still experiencing the same type of disease?)

MR. LAUCE:

Ang solusyon po namin ay pinuputol…. (Our solution is we cut….)

ATTY. MAYO-ANDA:

Hindi, ang tanong ko po ay hanggang ngayon po napapansin po ninyo na may kadang-kadang pa? (No, my question is, can you still observe that there's still kadang-kadang until now?)

MR. LAUCE:

Marami pa po. Marami pa. (A lot, ma'am. A lot.)

ATTY. MAYO-ANDA:

At iyong binanggit ninyo po kaninang brontispa*, ang dahilan din po ba niyon ay katulad din po ng dahilan sa kadang-kadang*[3]*?* (And you mentioned earlier the brontispa, is the cause also the same as the kadang-kadang?)

[3]*(Editor's Note: Kadang-kadang – derived from the Bicol term 'gadan-gadan' – refers to a premature decline and death of coconut palms earlier associated*

MR. LAUCE:

Siguro po, kasi po insekto ito eh, yung brontispa. (Maybe, because this is also an insect, the brontispa.)

ATTY. MAYO-ANDA:

Magkaiba po? (Is it different?)

MR. LAUCE:

Magkaiba po iyo ng kaso. (Those are different.)

ATTY. MAYO-ANDA:

Ang dahilan…? (The reason?)

MR. LAUCE:

Oo. (Yes.)

ATTY. MAYO-ANDA:

Ang sunod ko pong tanong, iyong, binanggit ninyo kanina iyong epekto sa pangingisda. (My next question is about what have you mentioned about the effects in fishing earlier.)

MR. LAUCE:

Opo. (Yes.)

with viroid infection, the only record of a disease that h as caused tremendous economic losses in the coconut plantation. The disease is spread by coconut scale insects.)

ATTY. MAYO-ANDA:

Nadudokumento ninyo ho ba iyong pagkakawala, iyong kawalan po, yung pagbawas po ng inyong kinikita? Batay po sa nasabi ninyo sa salaysay, medyo nahihirapan po kayo, eh. (Were you able to document the disappearance, the losses, the decrease in your earnings? Based on what you mentioned in your Statement, you were somehow struggling.)

MR. LAUCE:

Estimate lang po na nababawasan iyong aming kita. Doon sa nabanggit ko kanina, talagang nabawas, eh. Halos isang kilo na nga lang ang nahuhuli namin nitong bandang huli po. At hindi lang isang kilo, maliliit pa na klase. Napipilitan kaming kunin iyong maliliit kasi kung hindi namin kukunin iyon, wala kaming maiuuwi sa aming tahanan.

(We can only say that our earnings are getting low based on estimates. About what I mentioned earlier, it is really decreasing. We just catch about one kilo recently, and the varieties we get are also small. We were forced to catch the small ones because if we are not going to do so, we would not have anything to bring to our homes.)

ATTY. MAYO-ANDA:

So dati-rati po? Kung isang kilo na lang ang nahuhuli ninyo ngayon, dati-rati gaano kadami po ang nahuhuli ninyo? (So if you are getting one kilo now, how many kilos were you able to catch before?)

MR. LAUCE:

Dati po (Before) more or less *mga* seven (7) kilos *ho*.

ATTY. MAYO-ANDA:

Seven (7) kilos?

MR. LAUCE:

Oo (Yes), seven (7) kilos.

ATTY. MAYO-ANDA:

So kung sa usapin po ng financial loss, magkaano po ang pagkaluging iyan sa piso? (So when it comes to financial losses, financial deficit, what is the cost in pesos?)

MR. LAUCE:

Dati kung kumikita kasi mababa pa naman iyong pera noon, mataas pa ang value. Noong unang panahon, mga 1970s-1980s, kumita ka na ngtwo hundred (200), napaka-jackpot ka na po noon. Pero ngayon po, kahit kumita ka ngthree hundred (300), parang tabla-tabla lang. O one fifty (150), ganoon. (Before it was different because the money had more value. Back in the early days, in the 1970s-1980s, if you were earning two hundred pesos (PhP 200), that was already like hitting the jackpot. But now even if you earn three hundred (PhP 300), it is just breakeven; or one hundred fifty(PhP 150), like that.)

ATTY. MAYO-ANDA:

At panghuli ko pong tanong, Ginoong Lauce, iyon pong karanasan ninyo, nakikita ninyo rin ba siya na nararanasan po ng inyong kapwa magsasaka at mangingisda sa Capalonga? (And for my final question, Mr. Lauce, can you say that your fellow farmers and fishermen in Capalonga also experience what you went through?)

MR. LAUCE:

Nararanasan ho. Sa katunayan ho mas medyo nakaka-bentahe po kami sa kanila kasi po noon pong May 2018 *nabigyan po ako ng*one point eight (1.8) *hektarya ng lupa galing po sa* DAR. Naging beneficiary *po ako ng* DAR. (They also experience it. But, in fact, we are in a better position compared to them because last May 2018 I got one point eight(1.8) hectares of land from DAR. I became a beneficiary of DAR.)

ATTY. MAYO-ANDA:

At nadudokumento ho ba ninyo ang kahirapan na nararanasan po ninyo at ng inyong kapwa magsasaka at mangingisda? (And are you able to document the hardship that you and your fellow farmers and fishermen experience?)

MR. LAUCE:

Palagay ko po hindi. (I do not think so.)

ATTY. MAYO-ANDA:

Okay*, kay Ginang Delia po. Salamat po sa presentasyon. May binanggit po kasi kayo sa salaysay na personal na epekto sa inyo ng tag-init. Puwede po bang maipaliwanag ninyo iyong karanasang iyon?* (Okay, for Mrs. Delia. Thank you for the presentation. You mentioned in your Statement about the personal effect of intense heat. May you please explain that experience?)

MRS. TULAGAN:

Ay! Napakahirap po sa amin noong masyadong mainit dahil kapag lumalabas po kami sa bahay at inaabutan po kami ng init, sasakit na ang aking ulo. At madalas ay nakakapanghina ng katawan. Mahirap din ang pamumuhay dahil nasisira po ang aming pananim tulad po ng palay at niyog. Nagkakaroon ng kakapusan sa pinansyal dahil bilang magsasaka, ninety percent (90%) po ng aming kabuhayan nakaasa sa pagtatanim ng palay at niyog. Iyon lang po. Salamat po.

(It was really difficult for us to go out during summer because whenever we went out of the house, and it was very hot, I would have headaches. And oftentimes, I felt weakened. Making a living was also difficult because our crops like rice and coconut got destroyed. There is financial insufficiency because as farmers, ninety percent (90%) of our livelihood is dependent on planting rice and coconut. That's all. Thank you.)

ATTY. MAYO-ANDA:

Salamat po. Pinabago ninyo po yung inyong pangatlong pahina, Ginang Delia. Sabi ninyo po sa question twelve (12)*, ang sagot ninyo ay hindi*twenty-five percent (25%) *kung hindi po a*yninety-five percent (95%) *ang laki ng napinsala sa inyo. Puwede po ba ninyo dagdagan ang pagpapahiwatig ukol dito?* (Thank you. You asked us to change your answer on the third page, Mrs. Delia. You said that in question twelve (12), your answer is not twenty-five percent (25%) but ninety five percent (95%) in terms of damage. May you please expound on this?)

MRS. TULAGAN:

Yes po. Iyong pananim po noong nagbagyo ng Rosing, totally damaged po talaga kami noon. Walang-wala po talaga kami noon. Dahil ang tanim po naming niyog na iyan ay naubos po lahat ng dahon, puno lang po ang natira. Pati bahay po namin, naubos po. Ang natira lang po ay haligi.

(Yes. When Typhoon Rosing hit, the crops were really totally damaged. We had nothing. The leaves of the coconut trees were all gone and only the trunks were left. Even our house was totally damaged, the only thing that was left was the columns.)

Diyan po ako inabot ng pag-collapse. Nawalan po ako ng malay din. Noong nagising po ako naroon na ako sa school namin. Dinala na pala ako doon dahil wala na kaming bahay. Tapos po ang mga baboy po namin ay namatay din. Ang natira po sa amin ay kalabaw lang. Tapos lahat po ng aanihin namin sa danaw noon, naubos pong lahat. Totally po walang-wala kami. Ang natira lang puno ng niyog noon. Wala na pong bunga ang niyog noon. Tatlong taon din po kaming nagsakripisyo.

(That was the time when I collapsed. I lost consciousness. When I regained consciousness, I was already at the school. I was brought there because we do not have a house anymore. And then all our hogs died as well. The only one that was left is our carabao. And then all of our harvest in the rice field were all gone. Totally, we have nothing. The only thing that was left are the coconut trees which do not have any fruit. We sacrificed for three years.)

ATTY. MAYO-ANDA:

Dalawang (2) *tanong na lang po. Iyong sa danaw po, mahalaga po ba ang papel ng danaw sa inyo pong pagsasaka?* (Only two (2) more questions. Does the rice field have an important role in your farming?)

MRS. TULAGAN:

Opo. (Yes.)

ATTY. MAYO-ANDA:

Ngayon, mayroon pa ho bang tubig iyong danaw ninyo? (Now, is there any water in your rice field?)

MRS. TULAGAN:

Iyon po walang-wala na talaga. Wala na po kaming danaw, natuyo na pong lahat. At iyong kinukunan po namin ng tubig, tuyung-tuyo na po. (That has really nothing. We do not have rice fields, it all got dried out. And the place where we get water is also very dry.)

ATTY. MAYO-ANDA:

At papaano ngayon iyong inyong pagsasaka? (And how is your farming now?)

MRS. TULAGAN:

Humihingi nalang po kami ng pinansyal namin na gastusin. Sa niyog nalang po, na minsan din nahuhulog ang bunga gawa ng sobrang init. Dahil po iyong lupa namin ay mataas po. Bulubundukin po iyon. (We just ask for financial aid. We only harvest coconuts. And sometimes, the coconuts just fall off because of the intense heat. That is because our land is in higher slope, hilly.)

ATTY. MAYO-ANDA:

Pero iyong palay po, kayo ho ba ay nakakapag-ani pa ng palay? (But the rice, can you still harvest rice?)

MRS. TULAGAN:

Noong nakaraang taon po, mayroon pa po kaming mga ani. Pero sa ngayon pong taon, wala po talaga. (Last year we were able to harvest. We can only make it once a year. But this year, we have nothing.)

ATTY. MAYO-ANDA:

Wala kayong naaning palay? (There's no harvest of rice anymore?)

MRS. TULAGAN:

Wala po. Hindi na po kaya magtanim. Totally, *nanatili siyang bitak-bitak.* (Nothing. We can no longer plant. The land remained totally cracked.)

ATTY. MAYO-ANDA:

Salamat po. (Thank you.) That would be all, Your Honor.

PANEL CHAIR CADIZ:

Commissioner Armamento?

COMM. TANODRA-ARMAMENTO:

Thank you, Chair. *Magandang hapon po sa inyong dalawa.* (Good afternoon to both of you.)

MR. LAUCE AND MRS. TULAGAN:

Magandang hapon po. (Good afternoon.)

COMM. TANODRA-ARMAMENTO:

Ang una ko pong tanong, sa inyong kaalaman, hindi ba nalaman ninyo na may pagbabago na ang panahon? So mayroon ba kayong alam na nangyari sa inyong lugar na naging dahilan kung bakit nagbago ang panahon? (My first question is, to your knowledge, are you not already aware that there are changes in the climate already? So are you aware of any event in your place that might have caused the change of climate?)

MRS. TULAGAN:

Sino ang tinatanong?Ako? Sino ang tinatawag? Ikaw? Ako ang sasagot? Ay ma'am, thank you po sa tanong. (Who are they asking? Me? Who are they calling? You? I will answer? Ma'am, thank you for the question.)

MR. LAUCE:

Humarap ka sa kanila. (You face them.)

MRS. TULAGAN:

Haharap ako? (I am going to face them?)

COMM. TANODRA-ARMAMENTO:

No, it's okay.

PANEL CHAIR CADIZ:

Hindi, okay lang. (No, it's okay.)

MRS. TULAGAN:

Ang napansin ko po noong mga panahon noon hanggang ngayon po ay ang pagkawala ng maraming punungkahoy kaya ganito po ang dinaranas namin. (What I noticed back then and until now is, maybe, the disappearance of many trees and that is why we are experiencing this.)

COMM. TANODRA-ARMAMENTO:

Ginoong Elicer, sa inyo pong lugar, mayroon din po ba kayong nakitang pangyayari na naging dahilan kung bakit nagbago ang panahon? (Mr. Elicer, in your place, did you witness any events that are causing the changes of the climate?)

MR. LAUCE:

Ang iniisip ko ho ang pagbabago ng panahon kasi nalalaman ko iyong pagkasira ng ozone layer. *Ito iyong hindi magandang pangangasiwa ng tao sa kalikasan at iyong pagsalaula, pagsunog ng* plastic, *etc.* (I am thinking of the changing of climate because I know about the destruction of the ozone layer. This is the dreadful management and stewardship of man of his environment, the burning of plastic, etc.)

COMM. TANODRA-ARMAMENTO:

Maraming salamat po. May sunod akong tanong with the permission of the Chair. (Thank you. I have a follow-up question with the permission of the Chair.)

PANEL CHAIR CADIZ:

Please proceed.

COMM. TANODRA-ARMAMENTO:

Dahil nagbago ang panahon at pati ang inyong mga paghahanap-buhay ay nagbago rin, may ginawa ba kayong paraan na binago ninyo ang inyong pamumuhay para gumanda kahit nagbago narin ang panahon? (Because of the changes in climate, your livelihood also changed. Did you do anything to change your ways of living so that it can improve even with the change of climate?)

MR. LAUCE:

Mayroon po. (There is.)

COMM. TANODRA-ARMAMENTO:

Puwede ninyo hong ipaliwanag? (Can you elaborate?)

MR. LAUCE:

Ngayon ho, nagpa-practicena ho kami ng organic farming. At katunayan po, iyong aking pinamumunuan na samahan ay mayroon hong naibigay ang BUB iyong Bottoms-Up Budget na kalahating milyon para mag-produce po kami ng vermicast para sa organic fertilizer production. At ngayon po, mayroon po kaming pinapasok na negosyo ho, iyong paggawa ng coco coir. Mayroon po kaming Capalonga Coconut Industry Development Councilsa amin pong bayan at sinisikap po naming mag-asawa na iyong aming mga anak ay kung maaari po mapagtapos lahat ng pag-aaral.

(Nowadays, we are already practicing organic farming. And, in fact, the organization I am heading is a recipient of a half-million pesos from BUB – that's the Bottoms Up Budget – so that we can produce vermicast, that is, organic fertilizer. And as of the moment, we are also venturing into manufacturing coco coir. We have Capalonga Coconut Industry Coucil in our town and my wife and I are determined to make all of our children graduate as much as possible.)

COMM. TANODRA-ARMAMENTO:

*Maraming salamat po. Sa inyo naman po Ginang Delia Tulagan, ang tanong ko po ay dahil sa pagbabago ng panahon may ginawa kayong paraan para po mag-*adjust *sa pagbabago ng panahon para gumanda naman ang inyong*

buhay? (Thank you. With you, Mrs. Delia Tulagan, my question is because of the changes in climate, did you do anything so that you can adjust with the changing of climate so that there will be improvement in your lives?)

MRS. TULAGAN:

Mayroon po. (Yes, there is.)

COMM. TANODRA-ARMAMENTO:

Puwede po bang ipaliwanag ninyo sa amin? (Can you explain it to us?)

MRS. TULAGAN:

Ang ginagawa po namin sa ngayon po ay may alaga kaming baboy na siya naming pandagdag sa aming pinansyal na gastusin. Nagpapalaki po kami ng baboy. Iyon lang po. (What we are doing now is hog raising which supplements our financial expenses. We are raising hogs. That is all.)

COMM. TANODRA-ARMAMENTO:

Maraming salamat po. (Thank you.)

PANEL CHAIR CADIZ:

Thank you very much, Commissioner Armamento.

Commissioner Pimentel-Gana?

COMM. PIMENTEL-GANA:

Thank you, Chair. Magandang hapon. Salamat sa inyong dalawa (2) po. Katulad ng tinatanong ni Comm. Leah, mayroon nga kayong pagbabagong ginawa sa inyong buhay. Binago ninyo ang inyong pamumuhay. Puwede bang malaman noong mga 1970s, mga magkano kaya ang kinikita ninyo per month? Iyong nag-uumpisa kayo na nagsaka, nangisda. Magkano iyong kita ninyo per month?

(Good afternoon. Thank you both. Just like the question of Comm. Leah, you do have changed your way of living. Can we know your earnings per month

way back in the 1970s? When you were just starting to farm, to fish. How much do you earn each month?)

MR. LAUCE:

Hindi ko pa po alam, Your Honor. *Kasi po bata pa po ako noon.* (I do not know, Your Honor. I was young back then.)

COMM. PIMENTEL-GANA:

Hindi, noong nag-umpisa ka. Noong ikaw na. (No. When you started. When it was your turn.)

MR. LAUCE:

Per day ho, minsan, hindi naman po kasi tuluy-tuloy sa pangingisda, kumita ka ng mga singkwenta pesos (PhP 50) *ho noon.* (Per day, sometimes, since we were not fishing continuously you earned fifty pesos pesos (PhP 50) before.)

COMM. PIMENTEL-GANA:

Oo, pero mura pa ang bilihin noong araw ano ho? So sa singkwenta pesos (PhP 50)*, nakakakain ba kayo sa tatlong* (3) *beses?* (Yes, but the goods are cheap back then, isn't it? So with fifty pesos (PhP 50), can you eat three (3) times?)

MR. LAUCE:

Oo, Oho. Nakakakain ho kasi kahit naman ho wala kaming pera ay marami naman po kaming prutas, mga saging at saka mayroon naman po kaming palay. May bigas ho kami. (Yes, yes. We were able to eat because even though we did not have money we still had lots of fruits, bananas, and we also had rice.)

COMM. PIMENTEL-GANA:

Kasi maganda ang pagtatanim ninyo ano po? Maganda pa? Sa ngayon, magkaano iyong araw-araw na kinikita ninyo at naapektuhan ba inyong pagkain or ang inyong pamumuhay? May mga pagbabago ba? (Because you were farming well, isn't it? Is it still doing well? So these days, how much is

your day-to-day earning? Is there an effect in your food consumption? Or in your way of living? Are there any changes?)

MR. LAUCE:

Mayroon pong pagbabago lalo na po noong 1995, iyong dumaan po iyong Bagyong Rosing. Mga tatlong (3) taon po bago sumauli iyong bunga ng niyog. At ngayon po iyong mga saging namin may mga sakit na rin. Hindi na siya talagang healthy. At sa kita, bale, iyon ho kasing mga pananim namin, bihira po kaming magbenta pansarili lamang.

(There are changes especially in 1995 when Typhoon Rosingstruck. It took three (3) years before coconut trees bore fruits. And our bananas are also affected. They are not really healthy anymore. And with the earnings, well, we seldom sell our crops. They are for personal consumption only.)

COMM. PIMENTEL-GANA:

Ah so sa inyo na lang, hindi na kayo nakakapagbenta? (Oh so, it was for personal use, you did not sell them?)

MR. LAUCE:

Ano lang po, pakaunti-kaunti lang po. (Just little by little only.)

COMM. PIMENTEL-GANA:

Dati nakabibenta ba kayo? (Before you were selling them?)

MR. LAUCE:

Dati po nakakabenta. (Before we were selling.)

COMM. PIMENTEL-GANA:

So source of income *din ninyo dati iyong pagbebenta, ngayon, para nalang sa sarili ninyo?* (So selling was another source of income before, now it's only for personal use?)

MR. LAUCE:

Opo. (Yes.)

COMM. PIMENTEL-GANA:

So malaki po ang pagbabago. (So there's a big change?)

MR. LAUCE:

Malaki po ang pagbabago. (There is a big change.)

COMM. PIMENTEL-GANA:

Kayo po, Ginang? Ganoon din ho ba ang nangyari sa inyo? (How about you, Ma'am? Did the same thing happen to you?)

MRS. TULAGAN:

Opo. (Yes.)

COMM. PIMENTEL-GANA:

So nakikita ninyo sa pamumuhay ninyo sa daily sustainance ninyo ay may malaking pagbabago? Ngayon po, iyong sa local government naman po sa inyong lugar, anopo, mayroon bang ambag sa inyo ang lokal na gobyerno sa pamumuhay ninyo? Paano ho sila tumulong sa inyo kung mayroon man?

(So you see in your way of living, in your daily sustenance, there is a big change? Nowadays, with the local government in your place, is there any contribution from the local government to improve your life? How did they help you, if there is any?)

MR. LAUCE:

Sa samahan po, mayroon pong ibinibigay sa aming ayuda katulad doon sa BUB mayroon na hongfifteen percent (15%) na ibinigay ang LGU dito sa bago naming Capalonga Coconut Development Council. Ngayon hong taon, nagbigay po sa amin ng two hundred thousand (200,000) at sa next year ho mayroon pa silang ipinangakongtwo hundred thousand (200,000) para po sa

production ng coco coir. Para po iyong mga bunot po sa amin ay hindi na maging basura at maging pera at magkaroon po ng hanap-buhay iyong maraming mga taga-Capalongang wala pong hanap-buhay.

(In our organization there was an aid given like the BUB. The LGU already gave fifteen percent (15%) to our new Capalonga Coconut Development Council. Just this year, we were given two hundred thousand (200,000) and they promised to give two hundred thousand (200,000) next year for the production of coco coir, so that the coconut husks in our place will not just end as garbage but converted into money. This will create work for jobless residents of Capalonga.)

COMM. PIMENTEL-GANA:

Oh so mayroon silang mga livelihood programs*na binibigay sa inyo po. Parang tulong sa inyo.* (Oh, so they gave livelihood programs for you. Like an aid to you.)

MR. LAUCE:

Bale 'yon pong assistance nila ay pera po iyon. Ang ka-tie-up ng Capalonga Coconut Industry Development Council ay iyong PEC, Pilipinas Ecofiber. Iyong pinu-produce naming fiber ay ginagawang lubid. Mga geonet at iyong mga coco peat ginagawang fertilizer po para saorganic. So kapag ma-train po iyong mga taga-Capalonga, kasi ho hindi pa rin nagtatagal iyon. Last August 1 po nagsimula iyon pong full operation. Magka-conduct po kami ng mga trainings sa mga bara-barangay para matuto po sila sa paggawa ng lubid.

(Well, their assistance is monetary. The Capalonga Coconut Industry Development Council has tied-up with the PEC, Pilipinas Ecofiber. We are producing coco fiber that is processed as ropes and geonets. And then the coco peats are manufactured as fertilizers for organic farming. So we train people residing in Capalonga. It just started not a long ago, it was just last August 1 when it started its full operation. We will conduct trainings in different barangays so that they can learn how to make ropes.)

COMM. PIMENTEL-GANA:

*Pero ito ho bang tulong na ibinigay ng lokal na gobyerno sa inyo ay dahil sa parang na-realize nila or pag-recognize na mayroong pagbabago sa klima, na hindi na ninyo nagagawa ang inyong mga dapat gawin–pangingisda, pagsasaka? Ano ho ba? Bakit nila kayo tinutulungan? Nare-*recognize *ba nila*

na may pagbabago? May sinasabi ba sila sa inyo na, "Oy, bago na ang klima?" May information *ba silang binibigay sa inyo tungkol sa pagbabago ng klima?*

(But is the local government giving you assistance because they realized or recognized that there is climate change, that you can no longer fish and farm? What do you think is it? Why did they help you? Did they recognize that there were changes? Did they tell you that "Hey, it is has changed already?" Are they giving information to you and your people regarding the changes of climate?)

MR. LAUCE:

Hindi ko po tiyak ang layunin nila sa tulong. Pero ang alam ko po, malaki iyong bilang ng aming grupo. Iyon lang po. (I am not sure about their intention in helping. But what I know is that our group has many members. That is all.)

COMM. PIMENTEL-GANA:

Okay, okay. So ang gobyernong-lokal sa inyong lugar hindi sila gumagawa ng paraan para tulungan kayo dahil sa nire-recognize nila na mayroong pagbabago sa klima na nakaka-apekto sa inyong pamumuhay. Walang ganoon. Walang correlationna ganoon. Walang ugnayan.

(So the local government in your place is not making any way to help you because they recognize that there is a change in climate that is affecting your way of living. No such thing. No correlation like that, no connection.)

MR. LAUCE:

Your Honor, nito pong bandang huli, may NGO pong nagpunta doon. Bale sila po ay gumawa ng resolusyon para masuportahan yoon pong waste management program saka po iyong pagsi-separate po ng basura. Iyong mga plastic, iyong mga nabubulok sa hindi-nabubulok. Bale mayroon na pong mga planong ganoon. Iyon po.

(Your Honor, just lately, there was an NGO that went there. They made a resolution to support the waste management program and the segregation of trash–the plastics, the biodegradable from the non-biodegradable. There are already plans like that. That's it.)

COMM. PIMENTEL-GANA:

Ah okay, so ibang… (Oh okay, so different…) Okay. Thank you.

PANEL CHAIR CADIZ:

Commissioner Dumpit.

COMM. GOMEZ-DUMPIT:

Magandang hapon po. (Good afternoon.)

MR. LAUCE:

Magandang hapon po. (Good afternoon.)

COMM. GOMEZ-DUMPIT:

Ginoong Lauce, itatanong ko lang iyong may nabanggit po kayo na ang source *ng inyong* irrigation *doon sa tanim ninyo ay sapa.*(I will just ask about the one you mentioned that the source of your irrigation there for your plants is the creek.)

MR. LAUCE:

Opo. (Yes.)

COMM. GOMEZ-DUMPIT:

Alam ninyo ba po kung bakit natuyo iyong sapa na pinanggagalingan ninyo ng tubig sa pagsasaka? May alam ba kayong dahilan kung bakit natuyo ito? (Do you know why the creek, the source of your water for farming, dried up? Do you know any reason why it became dry?)

MR. LAUCE:

Iyon nga po ang ipinagtataka ko kasi hindi naman siya napuputulan ng mga kahoy doon sa source *niya. Pero parang iniisip ko po na dahil iyon sa sobrang init po ay humina na ang tubig. Sa katunayan po, iyong aming sapa, iyon po*

iyong isa sa pinagkukunan po ng source *ng inumin patungo po doon sa barangay. Pero ngayon hong panahon, wala nang dumadaloy na tubig. Pumupunta na sila mismo doon sa* spring box*, doon sa* reservoir *para doon na kumuha, pero kaonti rin po ang nakukuha nila.*

(That's what I am wondering about because there was no cutting of trees at its source. But I somehow think that it was because of the extreme heat. That was why there's a slow flow of water. In fact, our creek is the source of drinking water going to the barangay. But these days, there is no flow of water. People would go directly to the spring box, in the reservoir, to get water but they get only very little.)

COMM. GOMEZ-DUMPIT:

Hindi ba iyon sapat na pang-serbisyo sa komunidad? (Is it not enough to serve the community?)

MR. LAUCE:

Ay hindi po. Hindi po. (Oh no. No.)

COMM. GOMEZ-DUMPIT:

So saan po kayo kumukuha ng tubig para sa pananim ninyo at saka sa pang-araw-araw ninyong gamit. (So where do you get the water for your crops and for your day-to-day use?)

MR. LAUCE:

Bale, wala na ho. Hindi na ho kami nagtatanim ng gulay kasi wala namang pandilig. Bale, patama na lang po iyon sa tao at iyong iba kanya-kanya ho ng diskarte. Mayroon po kasing ibang source din doon at sumasakay sila, nagbabangka ho sila para makakuha ng tubig para madala doon sa kanilang mga bahay-bahay.

(Well, there is none. We are not planting vegetables anymore because we cannot water them anymore. It depends on the people how they strategize. Some already use a boat to get water back to their houses.)

At sa palayan ho kahit ho may dagdag, kulang po, Your Honor. Kahit mayroong tubig doon sa aming lugar at puwede kaming magbukid hindi rin po namin ginagawa kasi kung ikaw lang ang makakabukid doon sa grupo na

iyon na mga palayan, ang lahat ng mga peste ay mapupunta sa iyo. Kaya mas mabuti pa, huwag ka na lang din magbukid.

(And in the rice fields, even if there is water in our place and we can still farm, we do not do it because if you are the only one who will farm in that group of rice fields, all the pests will just go to your crops. So it is better not to farm at all.)

COMM. GOMEZ-DUMPIT:

So anong ginagawa ninyo po doon sa lupa? (So what are you doing with the land?)

MR. LAUCE:

Noong minsan po, nagtanim ako ng sitaw na kalahating-kilo pero dahil nga po sa kakulangan ng tubig hindi na rin iyon naulit. (Once, I tried to plant half a kilo of beans but because of the scarcity of water, I did not do it again.)

COMM. GOMEZ-DUMPIT:

So nakatengga nalang po yong lupa? (So the land is just idle?)

MR. LAUCE:

Sa ngayon po, nakatengga lang kasi kung tataniman mo ng ibang pananim dadagsain din ng mga maninira, mga insekto. (As of now, it is idle because if you are going to farm other plants there will be a rush of pests, insects.)

COMM. GOMEZ-DUMPIT:

Marami pong salamat. (Thank you.)

MR. LAUCE:

Salamat din po. (Thank you, too.)

COMM. GOMEZ-DUMPIT:

Ginang Tulagan, magandang hapon. Itatanong ko lang po yung nabanggit ninyo na sa sobrang init ng klima nawalan kayo ng productive work hours. Iyong ang sabi ninyo nga po rito, hindi ninyo na kaya sapagkatten (10) o'clock ng umaga, hindi nyo na kaya iyong init. Noong araw po ba, puwede ninyo ba pong isalaysay kung ano ang inyong working hours sa bukid para makita rin kung ilang oras ang nawala noon na masagana pa at maganda ang klima na nakapagbubukid kayo as opposed to ngayon po na napakakonti nalang po ng oras na puwede ninyong igugol sa pagtanim ninyo sa bukid?

(Mrs. Tulagan, good afternoon. I would just ask about what you have mentioned about extreme heat that caused lost productive work hours. You also mentioned that you cannot tolerate the heat by 10 o'clock in the morning. Way back, can you state what were your working hours in the fields? So that we can see how many hours were lost when there was still plenty of harvest and the weather is still good as opposed to today when there is very little time that you can spend farming your fields.)

MRS. TULAGAN:

Nakakatrabaho po ako noon pong 1980s, mga seven (7) hours *po akong nabibilad sa sakahan namin sa danaw. Sa ngayon po hindi na po iyon kaya, sobrang init na po.* (In 1980s, I can work and be exposed to our farm in the rice pond for seven hours. As of now, I cannot tolerate that anymore, it is extremely hot.)

COMM. GOMEZ-DUMPIT:

Ilang oras na lang po ngayon? (How many hours now?)

MRS. TULAGAN:

Ay, ano nalang po, mga two (2) hours *na lang.* (Oh, it is just two hours only.)

COMM. GOMEZ-DUMPIT:

Ano po iyong tinatanim ninyo noong araw? (What crops did you plant back then?)

MRS. TULAGAN:

Nagtatanim kami ng palay. Katulong din po ako doon. Tapos ako ay nagpipilapil, iyong nagbabaseg po sa danaw namin. (We were planting rice, I was also helping there. Then I was also assigned to create the embankment, the one who elevated our rice fields.)

COMM. GOMEZ-DUMPIT:

Iyong danaw po, ano pong ibig sabihin ng danaw po? (The "danaw", what do you mean by "danaw?")

MRS. TULAGAN:

Danaw po iyon ang tinataminan po ng palay. Palayan po. ("Danaw" is the one where you plant your rice. Rice field, ma'am.)

PANEL CHAIR CADIZ:

Rice fields.

COMM. GOMEZ-DUMPIT:

Ah, rice fields.

MRS. TULAGAN:

Rice field *po*.

COMM. GOMEZ-DUMPIT:

Tapos iyong pilapil po iyong border *noong danaw*. Okay, *marami pong salamat.* (And then the "pilapil" is the border of your rice fields. Okay. Thank you.)

MRS. TULAGAN:

Thank you po, Your Honor.

PANEL CHAIR CADIZ:

Father Pedro Walpole.

DR. WALPOLE:

Magandang hapon, Ginoong Lauce. Gusto kong klaruhin dito ang tungkol sa pagbabago ng klima, ang nakita ko sa usapan ninyong dalawa. Iyong una ay talagang mas mainit pero may mga bulan na sabi mo rin na parang mas mahaba ang tagtuyot. May-June at saka Nobyembre-Disyembre. Di ba? Parang mas kaunti iyong ulan o sobra?

(Good afternoon, Mr. Lauce. I want to clarify here that the changing climate is what I took note in your conversations. The first is that it is really hot, but there are months that you also mentioned which is longer. May-June and November-December. Isn't it? Like the rain is too little or too much?

MR. LAUCE:

Mas mahaba po iyong tag-init. (The longer one is summertime.)

DR. WALPOLE:

Iyong tag-init. Okay. *Sa imong sapa na iyong problema din na mas kaunti iyong kahoy sa taas, so parang paspas iyong tubig na lumabas?* (During summertime, your creek has a problem because there are few trees in the upland like the water gushing and flowing out?)

MR. LAUCE:

Hindi naman ho nagalaw yung kakahuyan. Kaya nga ho ako nagtataka bakit hindi naman napuputulan ng kahoy ay humina po ang tubig. (The trees remained untouched. That is why I am wondering why there was subsidence of water even though there were no cutting of trees.)

DR. WALPOLE:

Okay*, salamat. So dahil dito klaro na may isa lang na anihan sa inyo.* (Okay, thank you. So because of this, it is clear that there is only one harvest time in your place.)

MR. LAUCE:

Opo, opo. (Yes, yes.)

DR. WALPOLE:

Yeah, okay. Pagdating sa mga tanong dito sa mangingisda, ang hinahanap ko talaga kung mayroong ibang dahilan na bumaba iyong catch ninyo. So sa dagat ninyo, may mga ibang fishing vessels ba na pumapasok o mas marami ba iyong mga local na mangingisda o pareho lang?

(When it comes to the questions here for fishermen, what I am really looking at are the other reasons why there is a decrease in your catch. So in your ocean, are there other fishing vessels arriving or is there more local fishermen or just the same?)

MR. LAUCE:

Paminsan-minsan po may mga dumadayo na mga commercial fishing. Pero iyon pong mga registered na fisherfolk po sa aming bayan ay one thousand six hundred forty-seven(1,647) *parang ganoon.* (From time-to-time, there are commercial fishing vehicles coming. But the registered fisherfolks in our town is one thousand six hundred forty-seven(1,647), like that.)

DR. WALPOLE:

Pero dati? (But before?)

MR. LAUCE:

Dati ho, hindi ko po alam ang datos. Siguro mas mababa noong dati. (Before, I do not know the data. Maybe there were fewer before.)

DR. WALPOLE:

Okay. Baka mayroon din ibang kukuha diyan. Okay. Nasabtan ko… Naintindihan ko na masakit… Kung pwede, sorry, balik tayo sa pagtatanim ninyo ng bigas, nagbago ba ang pagtatanim ninyo ng bigas per sack? May ibang varietyna gamitin? Naiibang fertilizer? Pataba na ginagamit ninyo ngayon kaysa dati?

(Okay. Maybe someone will get that data. Okay. I understand that it is painful… If you can, sorry, let us go back to rice. Is your planting of rice changing? Are there other varieties that you use? Different fertilizers? Fertilizer that you use now as compared to before?)

MR. LAUCE:

Mas pinipili na po namin iyong mas madaling anihin. Mgaone hundred fifteen (115) days, one hundred ten (110O) days at iyon hong paglipat namin saorganic farming hindi naman po kasi mabilisan mong i-start. Kailangan ho ay gradual at saka po iyon hong production ng aming vermicast ay hindi pa naman gaanong karamihan.

(Well, that was when we were still farming rice. We frequently chose those that could be harvested easily. Those that can be harvested within 115 days, 110 days, and the transition to organic farming was not that easy to start. We needed to do it gradually and also the production of our vermicast was not that much.)

DR. WALPOLE:

So ang vermicast *ang gamitin na lang sa palay, at may* advice *ba galing sa* Department of Agriculture *alang sa aling klase, mas maayong* variety*?* (So the vermicast is being used for the rice farming, and is there an advice from the Department of Agriculture as to what class, what variety to use?)

MR. LAUCE:

Opo, mayroon pong mga advice at madalas po ay pinapadala ho ako ng aming MAO, ng aming Municipal Agriculturist para sa mga training at hindi ninyo ho naitatanong, naging MAFC Chairman din po ako sa bayan ng Capalonga Municipal Agriculture and Fishery Council. At dahil po doon, ay marami po akong nadagdag na natutunan para sa organic farming. Kaya hangga't maaari nga po sana ay mag-organicfarming kung puwede lahat ng magsasaka.

(Yes, there is an advice. Our MAO, our Municipal Agriculturist sent me to trainings regularly. I became MAFC Chairman also in our town in Capalonga Municipal Agriculture and Fishery Council. Through that, I learned a lot about organic farming. That is why I hope that organic farming will be practiced by farmers as much as possible.)

DR. WALPOLE:

Oo. Maraming salamat po. (Yes. Thank you.)

MR. LAUCE:

Salamat din po. (Thank you, too.)

PANEL CHAIR CADIZ:

Thank you very much, Father Walpole. I have no further questions for the two witnesses. However, unless you would have...

Alright. I just want to remind you that your Annex CCCCC to CCCCC-2 has been amended, so may I remind you to have it photocopied and then exchange with the original document that you filed with us?

ATTY. MAYO-ANDA:

Yes, Your Honor, we will do that. Thank you, Your Honor.

PANEL CHAIR CADIZ:

Okay, if there are no further questions for these two witnesses, then they are excused and you may now proceed to your next witness.

ATTY. MAYO-ANDA:

Salamat po, puwede na po kayong... (Thank you. You may now…)

MR. LAUCE:

Salamat po. (Thank you.)

ATTY. MAYO-ANDA:

Thank you, Your Honor.

ATTY. PAUDAC:

Good afternoon, Your Honors. May we call on our next witness, our resource person, Mr. Geoffrey Supran.

PANEL CHAIR CADIZ:

Please swear in the witness.

CLERK OF THE INQUIRY:

State your name, citizenship, and your address.

MR. GEOFFREY SUPRAN:

Geoffrey Supran. I'm a British citizen and my current address is 4th Street Southwest, Washington DC, United States.

PANEL CHAIR CADIZ:

Counsel, you may have your witness.

ATTY. PAUDAC:

Yes, Your Honor. Before I proceed, Mr. Geoffrey Supran, how do you want to be identified or called by this Honorable Commission in this representation?

MR. SUPRAN:

Geoffrey is fine, thank you.

ATTY. PAUDAC:

Okay, thank you. Your Honor, we are presenting a brief introduction of the witness. Geoffrey Supran is a postdoctoral fellow working with Professor Naomi Oreskes in the Department of the History of Science at Harvard

University. He is also a postdoctoral affiliate working with Professor Jessica Trancik at the Institute for Data Systems and Society at Massachusetts Institute of Technology or MIT. He received his PhD in Materials Science and Engineering at MIT and also earned the MIT Graduate Certificate in Science, Technology and Policy. His expertise and research background are twofold, the engineering and modelling of clean energy technologies and the history of climate science disinformation by the fossil fuel industry.

Your Honors, we are offering the testimony of Mr. Geoffrey Supran. He will be presenting a paper he co-authored with Harvard University Professor Naomi Oreskes entitled assessing ExxonMobil's climate change communications between 1977 to 2014 touching an empirical analysis and comparison of one hundred eighty-seven (187) climate change communications from ExxonMobil and findings concerning whether the corporation has in the past misled the general public about climate change.

Your Honors, before we proceed, may we be allowed to ask questions regarding the documents that Geoffrey submitted before this Honorable Commission and this representation?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

Good afternoon, Geoffrey.

MR. SUPRAN:

Good afternoon.

ATTY. PAUDAC:

Geoffrey, I am handing to you three documents. First one is entitled as Profile and Statement of Geoffrey Supran, PhD dated August 2, 2018 consisting of twenty-three (23) pages, pre-marked as "DDDD" to "DDDD-22." Please go over the document. Second document is the Curriculum Vitae of Geoffrey Supran consisting of three (3) pages, pre-marked as Exhibit "EEEE" to "EEEE-2," and the last document, a PowerPoint Presentation of Geoffrey Supran on Assessing ExxonMobil's Climate Change Communication, consisting of thirty-eight (38) pages, pre-marked as Exhibit "FFFF" to "FFFF-

37." Do you confirm that you submitted these documents before this Honorable Commission and to this representation?

MR. SUPRAN:

I do.

ATTY. PAUDAC:

Okay Geoffrey, let me go to the first document, the "Profile and Statement of Geoffrey Supran." On page nineteen (19) of this document, there appears a signature above the name Geoffrey Supran, PhD. Whose signature is this?

MR. SUPRAN:

That's my signature.

ATTY. PAUDAC:

Geoffrey, do you confirm and affirm the statements you mentioned in this "Profile and Statement of Geoffrey Supran?"

MR. SUPRAN:

I do.

ATTY. PAUDAC:

Thank you, Geoffrey. Your Honor, at this point, may I request Geoffrey to start his presentation?

PANEL CHAIR CADIZ:

Please proceed.

MR. SUPRAN:

Your Honors, thank you for having me here today to speak with you about ExxonMobil's history of climate change communications. As many of you in the room will know, ExxonMobil is under scrutiny on several legal fronts. From the investigations by the Attorney General of New York and Massachusetts to lawsuits by US cities and states and some of the company's own employees and shareholders. Indeed, to this Commission's own Inquiry to some extent, a common question has emerged: Have communications about climate change by ExxonMobil and other fossil fuel companies misled customers, shareholders, or the public including in ways that may have broken the law? This is the key guiding question of my testimony today.

To approach this question, I begin by contextualizing my research on a broader timeline of climate denial; shown here running from 1940s to the present. As you've heard in more detail before from 1940s onwards, the oil industry engaged in research that was relevant to climate change and its impacts. In 1946, the American Petroleum Institute (API) founded the Smoke and Fumes Committee in Stanford Research Institute. Through the late 1940s and fifties, API and Humble Oil, now ExxonMobil were variously involved in research on subjects such as meteorology, paleoclimates, historical sea levels, and more.

Throughout this period, oil industry scientists and executives would have been hard-pressed to miss both landmark research and high-profile press coverage relevant to their business or articulating the potential for human-caused global warming. In fact, in 1957, Humble Oil scientists explicitly quantified what they call the massive cumulative carbon dioxide released to atmosphere by combustion of fossil fuels, citing the work of contemporary academics. In 1959, the heads of API were lectured in detail in person by physicist Edward Teller of projected global warming due to fossil fuelburning "sufficient to melt the ice cap and submerge New York." In 1968, sixty-nine, and seventy-two, reports commissioned by API warned with varying degrees of confidence a potentially "severe climate change." The 1968 report concluded that significant temperature changes almost certain to occur by 2000 inducing potential "melting of the Antarctic Ice cap and a rise in sea levels."

A few years later, scientists of one particular API member company Exxon themselves began briefing their executives. And in 1977, in a presentation entitled "The Greenhouse Effect," Exxon scientist James Black warned executives that "CO_2 releases the most likely source of inadvertent climate modification; that prevailing opinion attribute CO_2 increase to the fossil fuel combustion; that doubling CO_2 could increase temperature from one to three degrees Celsius by 2050; and that there was a five (5) - to ten (10)-year time window to get necessary information." His presentation came complete with graphs of projected global warming.

The following year, Exxon scientist Henry Shaw made an internal request for a scientific team to assess the possible impact of the greenhouse effect on Exxon's business. Among those hired was, as shown here, university researcher Andrew Callegari who had just published two (2) articles, one accepting that the surface temperature rise of two to three degrees (2-3°) for a CO_2 doubling is essentially correct, and the other describing climatically huge, temperature increases and ecological impacts that might result. That year, Callegari joined Exxon.

What then ensued at Exxon were two parallel initiatives developed in the eighties and effected in subsequent decades: climate research and also a complementary public relations campaign. According to a 1978 Exxon memo, these initiatives targeted four (4) audiences. One was the scientific community. From books between 1979 to eighty-two, Exxon pursued three (3) highly visible programs in climate research, and I note in passing the ExxonMobil's 2015 statement that two of these projects "had nothing to do with CO_2 emissions" is repeatedly contradicted by these internal documents. In 1984, Exxon characterized its approaches – establish a scientific presence through research program and climate modelling, selective support of outside activities, maintain awareness of new scientific development. Government was also targeted. As a 1980 Exxon communications plan explained, research is significant to Exxon since future public decisions aimed at controlling the buildup of CO_2 could impose limits on fossil fuel combustion.

Scientific research "provided Exxon with the credentials required to speak with authority in this area." In terms of Exxon's management, an '81 internal memo observed that CO_2 projects allowed Exxon to "develop a detailed understanding of the federal CO_2 program" which the corporation needs for its own planning. Finally, the public and policymakers were targeted. The company's climate research offered "great public relations value." In 1980, Exxon developed a CO_2 communications plan to target what they called opinion leaders who are not scientists. Most ominously, by 1988 this plan explicitly aims to "extend the science and emphasize uncertainty in scientific conclusions regarding the potential greenhouse effect."

I'd also note that at this point, we essentially arrived at a juncture. Through the eighties, Exxon has developed these plans and it comes to a crossroads. Is it going to continue to pursue a path away from this timeline of denial indicated here by this tiger-striped Exxon colors or is it going to double down on what it called communications of uncertainty to opinion leaders who are not scientists? And of course, unfortunately, the path that they took is really why we find ourselves here today and some of these results were really foretold by a 1998 planning scenario by Shell in which they forewarned that following the storms, a coalition of environmental NGOs brings a class-action suit against fossil fuel companies on the grounds of neglecting what scientists

(including their own) have been saying for years: that something must be done. And this brings us back to our guiding question – Have Exxon's communications misled?

ExxonMobil says such allegations are false and anyone who looked closely at the evidence will see that. Specifically, they've made available the internal documents that form the basis of journalist's accusations against the company. And in rebuttal, they'd offered the ten (10)-page list of the company's academic articles which they say undercut allegations against them. "Read the document," ExxonMobil challenged the public in 2015. Read all of these documents and make up your own mind.

My colleague at Harvard, Professor Naomi Oreskes, and I took up this challenge. Over the course of the year, we read the documents and analyzed them according to an established social science method. A year ago, we published the results in the journal, Environmental Research Letters, and this was the first ever peer-reviewed academic analysis of ExxonMobil's forty (40)-year history of climate change communications.

The first step in our content analysis was to bin the documents into four categories according to their degree of public accessibility. So this yielded thirty-seven (37) internal documents spanning from 1977 to ninety-five, seventy-two (72) peer-reviewed, and forty-seven (47) non-peer-reviewed documents from the eighties to the present. The fourth category of document we looked at was so-called advertorials – paid editorial style advertisements taken out by Mobil and then ExxonMobil on the op-ed page of the New York Times. We looked at all advertorials related to climate from an archive compiled by PolluterWatch and I note in passing that we've since identified additional advertorials not included in our original analysis which will form the basis of the forthcoming publication reaffirming our conclusions.
So having binned the documents, the next step was to characterize them into four (4) ways according to their type, topic, positions on global warming, and positions on the risks of stranded fossil fuel assets. And today we'll focus on positions on global warming.

So research has shown the four key points of understanding about climate change that is real, human-caused, serious, and solvable. They are the key predictors of public support for climate policies and that's not really a coincidence that this four (4) elements also underpinned most narratives of climate denial and skepticism namely: "it's not happening, it's not us, it's not serious, and it's too hard." And so, we therefore use these four elements as axes along which to characterize ExxonMobil's positions. And to keep things simple today, I'll focus mostly on the real and human-caused axis.

So we code each document by assigning what we call endorsement points EP-1 to EP-4b here so pertinent texts and figures based on whether each

acknowledges or doubts the scientific evidence that climate change is real and human-caused. Then, based on its individual endorsement points we assign each document one overall endorsement level. Acknowledge, acknowledge and doubt, doubt, or no position. So the results of our analysis appear on this timeline of the overall positions of all one hundred eighty-seven (187) documents. So we can begin with internal memos. Each line here represents an individual document and it's color-coded. Blue for acknowledged, black for acknowledge and doubt, red for doubt, and gray for no position. And dashes indicate documents filtered for reasonable doubts.

We see that the bulk of Exxon's internal documents take the acknowledged stance amounting to a cautious consensus consistent with mainstream science in the eighties. And this is really important because ExxonMobil has accused journalists of using "deliberately cherry-picked statements in demonstrating what Exxon knew" and yet we've looked at the entire cherry tree and the trends we observe are clear. For example, this 1979 internal Exxon study concluded the "increasing CO_2 concentration will cause a warming of the Earth's surface." This 1982 internal Exxon graph shows projected global warming, and this 1984 internal table shows that Exxon's expected average temperature rise of one point thre to three point one (1.3-3.1) Celsius was comparable to projections by leading research institutions.

Next, we see that ExxonMobil's peer-reviewed and non-peer-reviewed publications also acknowledge that climate change is real and human-caused; the peer-reviewed ones overwhelmingly so. For instance this 1985 report projecting warming for different emission scenarios concludes that the foregoing results, with all their caveats are consistent with the EPA's estimate of two degrees warming from fossil fuels CO_2 and other greenhouse gases by the middle of next century.

As another example Exxon's principal climate scientist was actually contributing author of chapter eight of the 1995 IPCC report which famously observed the "discernible human influence on global climate." He was also a co-author to the next IPCC report which found new and stronger evidence for human causation. Finally, turning here to advertorials, we see that the predominant stance is doubt shown in red. "Let's face it," this 1997 local advertorial stated, "the science of climate change is too uncertain to mandate a plan of action that could plunge economies into turmoil. Scientists cannot predict with certainty if temperatures will increase. We still don't know what role man-made greenhouse gases might play in global warming." Another example is this ExxonMobil from 2000 entitled, "Unsettled Science." It argues that "against the backdrop of large poorly understood natural variability, it is impossible for scientists to attribute the recent small surface temperature increase to human causes." So updating our analysis here, what the documents show is legitimate climate science coming from a small number of company scientists represented by the left arrow, but at the same

time discrepant public communications of doubt from the company represented by the right arrow. So informed by our content analysis we can now return to our guiding question, "Have Exxon's communications misled?" And crucially this is not the same as the strawman of whether the company suppressed climate research which is how Exxon has glossed allegations against it. In short, we find the answer to be yes.

ExxonMobil misled non-scientific audiences about climate science and its implications. To see why, we here plot for each type of document and full documents that express the position, the cumulative fraction of documents that take that position. So acknowledge is in blue and doubt is in red again. We observed a statistically significant trend as the company's climate communications become more publicly accessible, they increasingly communicate doubt.

Indeed, we find that roughly eighty percent (80%) of peer-reviewed articles acknowledge that climate change is real and human-caused and yet, essentially the same fraction of advertorials promotes doubt on the same matter. The overall trend in fact represents three forms of misleading communication. Firstly, our results show chronology of misinformation by Mobil and ExxonMobil advertorials and by some Exxon non-peer-reviewed publications. These public documents were often inconsistent with available scientific information at the time, and, therefore, misleading to public audiences.

The advertorials were particularly misleading for two (2) regards. Firstly, several contain explicit factual misrepresentations such as this 2011 advertorial we looked at earlier which presented sea surface temperatures for the Sargasso Sea in a way that could be interpreted to imply natural variability for the entire planet. The Woods Hole scientist who had produced that data complained to ExxonMobil about its very misleading use of his work. Secondly, these climate communications were so misleading because the company contributed quietly to the science and yet loudly to raising doubts about it. Internal documents, of course, were completely off-limits to the public and likewise its academic articles have citation counts suggesting readerships instantly from tens to hundreds.

So most texts are also, remember, highly technical and hidden behind walls. In contrast, advertorials taken out by Mobil and ExxonMobil were for the specific purpose of "letting the public know where we stand. Readerships were in the millions. Experimental psychologists have even found that an Exxon advertorial sufficiently, significantly, affects individual issue salience." The second way in which ExxonMobil has misled the public can be seen in direct discrepancies between its science and its advertorials now limited to the post ExxonMobil merger advertorial date range. So updating our analysis we see that the trends remain similar to before; with a statistically

significant discrepancy between the company's science and its more public communications.

Non-peer-reviewed publications were also sometimes misleading. For instance, a 1998 pamphlet with preface written by CEO Lee Raymond, stated that the IPCCs discernible human influence conclusion was "not peer-reviewed" even though it was, and even though ExxonMobil's chief climate researcher was a contributing author to that conclusion. The third way in which the company misled is by funding and orchestrating climate denial inconsistent with what our study shows the company knew–that climate change is real and human-caused. Since at least the 1980s, ExxonMobil's climate denial has taken at least four (4) forms: direct company statements, contrarian scientists, third-party organizations, and climate denying politicians.

And as this white paper I co-authored in 2016 show, while Exxon does to-date acknowledged in its formal public statements that climate change is real, it also continues to perpetuate climate science misinformation through increasingly veiled initiatives. So let's start with examples of how the company has itself communicated denial which we represent here with an added arrow to our timeline. At a shareholder meeting in 2000 CEO Lee Raymond signs the petition purportedly signed by seventeen thousand (17,000) scientists stating there is no convincing scientific evidence of human-caused global warming. The petition signatories included Star Wars characters and a Spice Girl. Two years later, Raymond told the conference, "We at ExxonMobil do not believe that the science required to establish the linkage between fossil fuels and warming has been demonstrated and many scientists agree." This of course contradicted the IPCC. In 2013, then CEO Rex Tillerson said, "Our ability to protect with any degree of certainty the future is continuing to be very limited because climate models are 'not competent.'"

ExxonMobil has also indirectly perpetuated climate denial now by funding contrarian scientists, another error here on our timeline. For example, astrophysicists Willie Soon published academic articles which he called deliverables in exchange for at least one and a quarter million dollars from fossil fuel companies. In 2000, Soon wrote that the 20th century is likely not the warmest of the last millennium, which is false. His paper was partly funded by API. Two years later ExxonMobil foundation began funding Soon paying him three hundred thirty-five thousand dollars ($335,000) over the next five (5) years. In 2005, in a paper funded by Exxon, the Cokes and API, Soon, claimed that solar variations and not CO_2 could explain recent Arctic warming and as he put it more bluntly in 2009, "It's the sun, stupid." Over the next five years, work was receiving funding from ExxonMobil he repeatedly emphasized the flawed notion of CO_2 driven climate change, challenged the IPCC's methods, and trumpeted the fallacy that "too much ice is really bad

for polar bears." Soon and his junk science have become the champion of influential climate deniers in Congress and the media.

The third way in which ExxonMobil has perpetuated climate denial is participation in or funding of third-party organizations; another arrow here on our timeline. Setting aside anonymous dark money contributions via donors trust, the company's direct contributions alone consist of more than thirty-five million dollars ($35,000,000) from seventy (70) to seventy-three (73) climate denying organizations between 1997 and 2016. For instance, the Global Climate Coalition (GCC) was co-created by Exxon in 1989 and through the nineties told journalists and lawmakers that "the role of greenhouse gases in climate change is not well understood."

The GCC spent thirteen million dollars ($13,000,000) campaigning against theKyoto Climate Protocol and sixty-three million dollars ($63,000,000) in political contributions. And in 1996, it worked to discredit the IPCC by claiming "institutionalized scientific cleansing." Its efforts were so successful that the White House told GCC, President Bush, "rejected Kyoto in part, based on input from you."

Another long Exxon funded organization is the Heartland Institute, which to this day publishes this climate denying spoof of the IPCC report. Until last month Exxon also funds the American Legislative Exchange Council. ALEC's formal position to this day is that, "Climate change is inevitable and a historical phenomenon." Finally, ExxonMobil appears to still be funding the National Black Chamber of Commerce whose website says there is no sound science to support the claims of global warming.

Fourthly, ExxonMobil contributes, continues to support climates denial by contributing to climate denying politicians; a fourth arrow on our timeline. It's been estimated in 2015, Exxon has spent at least twenty-seven million (27,000,000) on obstructive climate lobbying. From 2013 to 14 for example, ExxonMobil contributed three quarters of a million dollars to one hundred (100) climate denying members of Congress. In fact, since Exxon pledged to end its supports to climate denial in 2008 its contributions to climate denying members of Congress have doubled. For instance, Republican Senator James (Jim) Inhofe has repeatedly described global warming as the greatest hoax ever perpetrated on the American people. He has compared environmentalists to Nazis and insisted that climate change is impossible because "God's still up there." Inhofe received, at least, fifty-seven thousand dollars ($57,000) from Exxon Mobil including in 2015. The same year he tried to refute 2014's record temperatures by producing a snowball on the Senate floor.

So you'll recall that my focus has been on ExxonMobil's climate communications along this axis of real and human caused. However, I briefly note that in terms of climate change as being serious and solvable and with

respect to the risks of stranded fossil fuel assets, our analysis again reveals systemic discrepancies between what the company's private and public communications said whether at the statistical and document levels.

So on one hand for example we have this 1979 internal Exxon memo that warned that "doubling CO_2 concentrations might raise oceans four feet, melt the polar ice caps, cause major shifts in weather patterns, and make the tropics less habitable." And yet on the other, we have for example this Exxon Mobil advertorial twenty-one(21) years later which said, "just as changeable as your local weather forecast, views on the climate change debate range from seeing the issue as serious or trivial, and from seeing the possible future impacts as harmful or beneficial." We also have found that whereas not one advertorial alludes to the risks of stranded assets, twenty-four (24) of the documents do so. Most references are qualitative such as this 1982 internal Exxon primer observing the "mitigation of the greenhouse effect would require major reductions in fossil fuel combustion." But in five (5) cases we actually found that Exxon went to as far as to quantify how much CO_2 we can afford to burn before warming exceeds two degree Celsius (2°) and they were accurate within a factor of two of contemporary estimates.

So once again the evidence leads us to conclude that ExxonMobil has misled in this case about climate change as serious and solvable and about the risks of stranded assets. None of this is an accident as we've seen in the eighties and nineties Exxon developed communications plans targeting opinion leaders who are not scientists. And as with the tobacco industry, the explicit strategy was to "emphasize the uncertainty." As a communications team put together by Exxon, API, and others put it "victory will be achieved when average citizens and the media recognize uncertainties in climate science." And, of course, ExxonMobil is only part of the climate denial in our network. Others such as API, the Kochs and the Mercer family indicated by purple green and yellow arrows, I'm sorry, our very crowded timeline now, have all passed along the baton of climate denial culminating last year and President Trump's announcement that the U.S. was exiting the Paris climate agreement.

Sitting in the Rose Garden that day was Joseph Bast, CEO of the Heartland Institute. Twenty years on from that infamous "Victory will be achieved" memo, Bast wrote to his followers, we are winning in the global warming war. Data unfortunately confirms this. Yale University sociologist Justin Farrell has used computational network analysis to show that Exxon and the Kochs specifically have created a so-called ecosystem of influence on our public and policymakers. Comparing Exxon-funded organizations here in green, against those not funded by Exxon in red, Farrell quantitatively shows that Exxon funding has increased the quantity in volume of climate denial, its influence on denial's narratives, and denial's impact on the polarization of American opinion.

So with that I close by noting thatour results do not stand in isolation. It is the overwhelming consensus of experts studying the history of fossil fuel interest that fossil fuel companies and trade associations including ExxonMobil have variously orchestrated, funded, and perpetuated direct and indirect climate change misinformation. The historical evidence is incontrovertible and to my knowledge has never been challenged by ExxonMobil. In parallel, their analysis is now substantial evidence as we've seen that many of these companies and associations including ExxonMobil, Shell, the Global Climate Coalition, and API have variously known about the basics of climate change for decades. Put together, this evidence points only one way: fossil fuel companies and trade associations including ExxonMobil have variously promoted disinformation about climate change so as to stifle action by misleading the public and policymakers. Unfortunately, they appear largely to have succeeded. With that I will thank you for your time and I'm happy to take any questions.

ATTY. PAUDAC:

Your Honors, may be allowed to ask some questions?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

Thank you, Geoffrey, for that clear, graphical, and animated presentation. You mentioned that you've analyzed at least one hundred eighty (180) documents or communications from ExxonMobil. What do you think is one of the starkest example of ExxonMobil not only knowing about climate science and its implications decades ago, but also publicly undermining public awareness and understanding of that knowledge?

MR. SUPRAN:

I think probably the best examples at least amongst them are the ones that I presented in my testimony so I would quote for example one of the internal documents at slightly greater length. Exxon said this in 1979, “the most widely held theory is that increase in CO_2 concentration is due to fossil fuel combustion; increase in CO_2 concentration will cause a warming of the Earth's surface; and the present trend of fossil fuel combustion will cause dramatic environmental effects before the year 2050.” And so we can compare that on

the one hand against for example the advertorial that we saw ExxonMobil take out twenty (20) years later. You have to remember the time difference, in the New York Times and this advertorial was entitled "Unsettled Science." And it said, "against the backdrop of large poorly understood natural variability, it is impossible for scientists to attribute recent small surface temperature increases to human causes." So there was stark contrast in the language and the reach of these communications, on the one hand between the science, and on the other the denial.

ATTY. PAUDAC:

Thank you, Geoffrey. In order to give more time to the Commission, I'll just ask one more question. This your research show that Exxon is still misleading? So misleading the public about climate change to investors and the public?

MR. SUPRAN:

So to be clear, the peer-reviewed article that we published is regarding documents spanning up until 2014; however, as I mentioned during my testimony, I also co-authored a white paper in which the intent was to document not just the past but also the present, the ongoing misinformation by ExxonMobil. And based on that study, our conclusion was that yes, ExxonMobil continues to perpetuate misinformation through increasing veiled initiatives which makes sense. It's consistent with an evolution in what is and isn't perhaps acceptable as climate science because public awareness has evolved. For example, you know within the last few years ExxonMobil employees have themselves directly, explicitly expressed statements which could be construed to undermine, for example, the significance or the reliability of models that the scientific community recognize as authoritative when it comes to projecting global warming.

I also mentioned that as far as I have seen based on financial data available, ExxonMobil continues to give to the National Black Chamber of Commerce, which as I quoted from their website says there is no sound science to support the claims of global warming. As I mentioned they also continue to give, I believe as of this year, if not last year, on the order of a one hundred nine (109) climate denying members of Congress and I think the other final point to mention is I alluded to dark money through donor's trust.

This is basically a called like a black a… sort of an invisible ATM and a source of money whose origins we cannot trace. But what has been observed in the peer-reviewed literature is an increase, a rise in dark money contributions to climate denying organizations. And based on the track records of ExxonMobil

and others, it would not surprise me if some of this money were originating from fossil fuel interests, now increasingly by dark money.

One other observation is that there are broader forms of what one would call denial about the implications of climate science. So for example, mainstream scientific consensus is now that the fundamental business practice of the fossil fuel industry is quantifiably incompatible with the science of climate mitigation and so expenditures on the order of seven hundred billion dollars ($700,000,000,000) worldwide on continued fossil fuel exploration/extraction are in my opinion incompatible with the science of climate mitigation. And, likewise, whilst ExxonMobil and other fossil fuel companies do purportedly support carbon pricing schemes for climate policy, in reality it's been widely observed that they continue to instead fund lobbying against many of these policies. And as Senator Whitehouse points out from Rhode Island, as far as he knows, they have never actively lobbied for these policies that they purportedly support. So there's a spectrum of different forms of climate denial which has evolved over time, but in my opinion, through increasingly veiled initiatives ExxonMobil and others continue to support misinformation.

ATTY. PAUDAC:

Thank you, Geoffrey. Your Honors, that would be all for the witness unless you do have questions.

PANEL CHAIR CADIZ:

We do. Commissioner Leah Armamento will field in questions.

COMM. TANODRA-ARMAMENTO:

Good afternoon, Geoffrey. I would just like to ask why is this paper focused on Exxon only? How about the other Carbon Majors? Will this paper be a representative of the attitude of all Carbon Majors?

MR. SUPRAN:

So of course, this study was specifically focused on ExxonMobil and so could not be immediately extrapolated to apply to every other company in precisely the same way. We decided to focus on ExxonMobil in part because it has been particularly well known amongst those who study the history of fossil fuel companies that Exxon Mobil has perpetuated and funded climate denial. The other reason was a significant increase in the availability recently of

documents, internal documents, from specifically ExxonMobil. These were unearthed by investigative journalists at various news outlets and so the availability of these documents provided a first opportunity to conduct this kind of analysis; but of course, that opportunity now begins to arise with respect to other companies as additional internal documents emerge and that is something that is being pursued.

COMM. TANODRA-ARMAMENTO:

Thank you.

MR. SUPRAN:

Thank You.

PANEL CHAIR CADIZ:

Commissioner Pimentel.

COMM. PIMENTEL-GANA:

Hello, Geoffrey. So from what you've told Comm. Leah, there is still going to be a study on the others? Not only Exxon. So are you going to go through that study?

MR. SUPRAN:

Yes, that work is ongoing.

COMM. PIMENTEL-GANA:

Okay. So I was just wondering, after having published actually your research, has any of the CSOs or NGOs that are actually into climate change monitoring and all used your research to file any action against Exxon?

MR. SUPRAN:

ExxonMobil. I'm not an authority and I am not aware where our documents were used. But I am aware that, at least, I believe the New York City climate

lawsuit cited our work and I presume it's possible that other lawsuits against fossil fuel companies have done the same.

COMM. PIMENTEL-GANA:

Okay, what has Exxon said about your research? Did they comment on it?

MR. SUPRAN:

Yes. To my knowledge, ExxonMobil published two (2) statements criticizing our work. I direct you to the rebuttal that Professor Naomi Oreskes and I authored in the Los Angeles Times entitled "Yes, ExxonMobil Misled the Public," in which we addressed the different criticisms that ExxonMobil had made and we variously argued that they respectively had a strong hand at falsehood, cherry-picking, and character assassination. And, unfortunately, these tactics are characteristic, broadly speaking, of the kinds of strategies the fossil fuel interests pursued over decades in the attempt to undermine previously the physical climate scientists, and in our case now the social sciences too.

COMM. PIMENTEL-GANA:

You've said that politicians were actually being used against pronouncements in favor of the advocates for climate justice. What I'm asking is, are there other politicians now in the US, for example, having actually taken stock of what you've researched and done something to promote policy changes?

MR. SUPRAN:

Just to clarify, what I discussed in my testimony was climate denying politicians, those who do not accept basic climate science that says that climate change is human-caused. Those have been significantly funded by fossil fuel interests, including ExxonMobil. So your question is, are there politicians who essentially do the opposite?

COMM. PIMENTEL-GANA:

Yes.

MR. SUPRAN:

Yes. So of late, that in fact there have been campaigns called the "No Fossil Fuel Pledge." I believe at least dozens of either campaigning or elected politicians have signed this pledge around the United States and elsewhere in the world committing to not accepting any funding from fossil fuel companies and, yes, we've seen I believe, at least anecdotally speaking, an uptake in the recognition from some politicians that this influence is very harmful and a rejection of fossil fuel funding.

COMM. PIMENTEL-GANA:

But there has been no investigation by maybe Congress on the findings that you have actually unearthed of the wrongdoing of Exxon misleading the public in their information?

MR. SUPRAN:

Correct.

COMM. PIMENTEL-GANA:

Thank you.

MR. SUPRAN:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Dumpit will be asking questions.

COMM. GOMEZ-DUMPIT:

Hi. Thank you, Geoffrey. Just to follow-up on the questions that were propounded earlier in the two (2) published rebuttals by Exxon criticizing your work, so they did acknowledge the internal documents that you used in your content analysis? Did they acknowledge that these documents actually existed or maybe just to recast that question, where did you source the internal documents that you used? Because advertorials automatically are made

public, but the internal memos are not, so have they acknowledged this actually existed and that they used this as part of their internal communications?

MR. SUPRAN:

Yes. More than acknowledged, they unilaterally published most of their internal documents on their own website.

COMM. GOMEZ-DUMPIT:

So nothing was really sourced from, let's say, an anonymous employee from Exxon leaking the documents and all that?

MR. SUPRAN:

Correct. To my knowledge, all of the document's sources are known and acknowledged by ExxonMobil. But at least has not been challenged by the company. Yes.

COMM. GOMEZ-DUMPIT:

Just to also follow-up on the question asked by Comm. Gwen, what were the efforts after your study, of your group or your network in trying to perhaps advocate or ensure greater access to communications or documents that are produced by at least Exxon and other carbon major companies?

MR. SUPRAN:

Yes, unfortunately, you know, I find uncovering these documents is not always straightforward and we have previously said that we would welcome the production and making available easily of these and additional documents by ExxonMobil and other companies that will certainly assist us in shedding light on what the company knew. Increased transparency is always welcome. Does that answer your question?

COMM. GOMEZ-DUMPIT:

Yes.

MR. SUPRAN:

Okay.

COMM. GOMEZ-DUMPIT:

Last, I'm sure you said it earlier but I just wanted to make sure. So obviously the doublespeak is still there. Are you still monitoring Exxon and trying to update your study here? And then are there Carbon Majors, which companies are you actually monitoring in terms of this kind of study, applying this kind of analysis?

MR. SUPRAN:

Yes. We're continuing to do this kind of analysis, but I would rather not say which companies we are applying this analysis to until we publish the analysis.

COMM. GOMEZ-DUMPIT:

Alright, thank you.

PANEL CHAIR CADIZ:

Father Walpole.

DR. WALPOLE:

Thank you. I'm basically trying to put together what really are we facing here. So my understanding of the storyline here is that we have detailed records over the last couple of decades and the companies to a degree are willing to acknowledge this in a communication.

MR. SUPRAN:

Yes.

DR. WALPOLE:

Or in something they put out, but what's happening is they really have a strategy of misinformation as you call it that has a much broader reach and it's developed on simple taglines and easy to read or easy to absorb for people. So they're expecting people to deny the detail or ignore the detail. So this is really a psychological warfare of communication strategies and at the same time you can acknowledge the detail but it's sort of in a quieter cul-de-sac type.

MR. SUPRAN:

Yes. There are perhaps two issues at stake. One of it is volume. So as I noted, as I put it before, the company communicated the science quietly whilst also publicly promoting the doubt loudly. So I mentioned the number of citations of peer-reviewed and non-peer-reviewed articles, suggest readerships of tens maybe hundreds; whilst on the other hand, the New York Times op-ed pages, the second most read part of the New York Times and obviously has millions of readers.

Secondly, there's an issue of public accessibility or clarity and as you alluded to, internal documents are off-limits and peer-reviewed documents are highly technical and often behind academic publication paywall. ExxonMobil used advertorials specifically designed "to let the public know where we stand." They consulted with external public relations counsel. We know that from the internal documents in constructing their public relations campaigns including editorials.

DR. WALPOLE:

Thank you.

MR. SUPRAN:

Thank you.

PANEL CHAIR CADIZ:

If you were to put a dollar value to this, if you can… if it's possible, or if you have attempted to do so… behind this misinformation or campaign of deception allegedly on the part of this company, how much would it be over the given period of time?

MR. SUPRAN:

Just to clarify, do you mean the cost of financing the campaign or the cost of the damages and with the resulting situation? Do you talk about paying?

PANEL CHAIR CADIZ:

How about the first, and then the second?

MR. SUPRAN:

On the first, we know that on average ExxonMobil receives a discount from New York Times first advertorials because it's starting and I believe in 1972. It took an advertorial out every Thursday for twenty-nine (29) years and thereafter for a while a switch to every other Thursday and since they were good customers, in fact they dominated the advertorials of New York Times. They took out one in four of all New York advertorials in the New York Times over the entire period they were given a discounted rate of, I believe, roughly thirty-one thousand dollars($31,000) per advertorial so thirty-one thousand (31,000) times all. These editorials are a lot of money. And just to clarify those editorials covered a whole slew of different subjects that were relevant to the company's interest and just a fraction of those were climate-related but you could do the maths on that.

Secondly, in terms of the societal costs of ExxonMobil's climate denial I'm not going to put a dollar value on it; however, I believe myself and all of those who study the history of disinformation strongly believe, that these decades of disinformation have either actually confused the public or policymakers or provided an excuse for inaction by policymakers that almost undoubtedly have delayed climate action/climate mitigation. Since the costs of climate impacts continue to rise rapidly over time, one could hypothetically ballpark estimate the climate impact costs, the damage cost, associated with that delay due to denial. I can't on the spot try to put a dollar value to it, but given the costs of climate impacts in the United States and worldwide, for example, just taking specific climate impacts here and around the world given how large they are, and perhaps combined with attribution studies that we've heard earlier where one might be able to assign contributions fromemissions and also catalytic effects of climate change effects, one might be able to make estimates. I'm sure that they would be large.

PANEL CHAIR CADIZ:

For example, in the case filed by the New York City government against the five (5) big oil companies, do you know if they put a dollar value as to the damage that these companies are alleged to have cost the city?

MR. SUPRAN:

I don't know. I think it's also worth clarifying at this point that I'm not a lawyer and I'm not expert at reading these documents and or estimating damages, things like that. It's also worth pointing out that their claims of damages, I believe, as we heard from Mr. Heede, can be attributed due to the direct climate damages due to emissions and also associated perhaps with the cost of delay employed by the confusion promoted through disinformation. But with my expertise, my limited expertise, I can't elaborate further on that question.

COMM. GOMEZ-DUMPIT:

I was just whispering to Comm. Cadiz, I'm just curious, do you know Mr. Heede personally?

MR. SUPRAN:

Yes, I've met him for the first time a day before yesterday.

COMM. GOMEZ-DUMPIT:

Oh, okay. Just…

MR. SUPRAN:

I have previously exchanged emails with him. I very much respect the work that he does but we haven't personally met until we came here.

COMM. GOMEZ-DUMPIT:

Until now, okay.

MR. SUPRAN:

Meeting him here under exciting circumstances.

COMM. GOMEZ-DUMPIT:

Thank you. Thanks for feeding my curiosity.

PANEL CHAIR CADIZ:

Alright. Thank you very much, Mr. Witness. If you have no more questions, we appreciate your coming here to enlighten the Panel. Thank you very much.

You are now excused.

MR. SUPRAN:

Thank you for your time.

PANEL CHAIR CADIZ:

Commissioner Karen has requested for a 10-minute break before you present, I believe, your last witness for today.

Alright. We'll have a 10-minute break, thank you.

[Break]

CLERK OF THE INQUIRY:

All rise. The Honorable Inquiry Panel Chairman, Comm. Roberto Eugenio T. Cadiz, still presiding.

PANEL CHAIR CADIZ:

The Panel is now back in session, Counsels.

ATTY. MAYO-ANDA:

Good afternoon again, Your Honors. We would like to call our next witness, Mr. Carroll Muffett.

PANEL CHAIR CADIZ:

Please swear-in the witness.

CHR LEGAL OFFICER:

Kindly raise your right hand. Do you swear before this Commission to tell the truth, the whole truth and nothing but the truth in your testimony?

MR. CARROLL MUFFETT:

I do.

CHR LEGAL OFFICER:

Okay, kindly state your full name, your nationality, and your address.

MR. MUFFETT:

My name is Carroll Muffett. I am from the United States. My address is 1101 15th Street, Northwest Washington, DC 20005.

CHR LEGAL:

Thank you so much.

PANEL CHAIR CADIZ:

Counsels, you may proceed.

ATTY. MAYO-ANDA:

Okay. Good afternoon, Mr. Carroll Muffett. How would you like to be called?

MR. MUFFETT:

Carroll.

ATTY. MAYO-ANDA:

So good afternoon again, Carroll. Mr. Carroll Muffett, Your Honors, is the president and chief executive officer of the Center for International Environmental Law or CIEL, a non-profit organization that uses law to protect the environment, promote human rights, and ensure a just and sustainable society. Carroll is a recognized expert on International Environmental Law and is a leader in the emerging field of international legal responses to climate change. He has authored numerous articles and textbook chapters on National International Environmental Policy. We are offering him, again, as a witness to continue the discussion on the CIEL's legal evidentiary basis. CIEL's research entitled "Smoke and Fumes: The Liability or Accountability of the Carbon Majors Beginning 1957 Up to the Present." And also to discuss a fairly recent briefing entitled, "A Crack in the Shell," pertaining to new documents that expose a hidden climate history.

Before we proceed, Your Honor, may I be allowed to have him identify nine (9) documents?

PANEL CHAIR CADIZ:

Please proceed, Counsel.

ATTY. MAYO-ANDA:

There are nine (9) documents, Carroll. Could you please look at this document which consists of thirty-six (36) pages? The first one is "Profile and Statement." So this is a document that you prepared?

MR. MUFFETT:

Yes, it is.

ATTY. MAYO-ANDA:

Now the signature which appears in the last page of this document…

MR. MUFFETT:

That's my signature.

ATTY. MAYO-ANDA:

Thank you. Before I proceed, Your Honor, we would like to manifest that the witness has changed slightly, it's actually a typographical error, on page fourteen (14).

PANEL CHAIR CADIZ:

Of which Exhibit?

ATTY. MAYO-ANDA:

Of Exhibit "GGGGGG."

PANEL CHAIR CADIZ:

G?

ATTY. MAYO-ANDA:

Yes, which is the "Profile and Statement of Carroll Muffett," page fourteen (14) referring to answer number eighteen (18), line number nine (9). It's actually a slight change in the year instead of 1951, Your Honor, it should be 1958. So he had already signed the original document; but we just want to manifest it.

PANEL CHAIR CADIZ:

Alright. So, we remind you to pull out the originally-submitted exhibit and replace it with the photocopies of those exhibits.

ATTY. MAYO-ANDA:

Yes, Your Honor. Now, Carroll, do you confirm and affirm the contents of this "Profile and Statement?"

MR. MUFFETT:

I do.

ATTY. MAYO-ANDA:

The next document refers to a biographical sketch consisting of eight (8) pages which has been previously marked as Exhibit "SS to SS-7." Could you please take a look at this and confirm if that is the document that you submitted to the Commission on Human Rights?

MR. MUFFETT:

Yes, it is.

ATTY. MAYO-ANDA:

Thank you. The next document is pre-marked as "HHHHH," entitled "Oil, Carbon, and Climate Change Known Risk and Foreseeable Harm," which is a PowerPoint presentation, consisting of twenty-three (23) pages. Do you confirm and affirm the contents of your documents?

MR. MUFFETT:

I do.

ATTY. MAYO-ANDA:

The next document, previously marked as "IIIII" is entitled "A Crack in the Shell" of CIEL: "New Documents Exposing Hidden Climate History." Please take a look and inform us if that is one of the documents you submitted to the CHR.

MR. MUFFETT:

It is.

ATTY. MAYO-ANDA:

Thank you. The next document previously marked as "JJJJJ" is entitled, "Accomplishments in Air Pollution Control by the Petroleum Industry," by Dr. Jerry McAfee. Please take a look if this is one of the documents you submitted to the Commission.

MR. MUFFETT:

It is.

ATTY. MAYO-ANDA:

Thank you. And the the next document, pre-marked as "KKKKK" refers to a Letter to Exxon Research and Engineering Company on the Greenhouse Effect. This actually consists of about thirty-four (34) pages. Could you confirm and affirm Carroll if that is one of the documents submitted to the CHR?

MR. MUFFETT:

Yes, it is.

ATTY. MAYO-ANDA:

Thank you. And then the next document, previously marked as "MMMMM" is a Letter to Mr. Nat King of the Exxon Corporation consisting of two (2) pages. Could you take a look if it's one of the documents submitted to the Commission on Human Rights?

MR. MUFFETT:

Yes, it is. I would note that it is four (4) pages.

ATTY. MAYO-ANDA:

Yes, thank you for calling my attention. It consists of four pages and the last document, consisting of thirty-four (34) pages pre-marked as "NNNNN" to "NNNNN-33." Please take a look at it again. It refers to the minutes of the joint hearings of the Department of Public Works in the United States.

MR. MUFFETT:

And with this final document I would note only that the actual hearing record runs to several hundred pages, so this is a relevant excerpt from that hearing.

ATTY. MAYO-ANDA:

Okay, so we would like to have that manifested that this is just an excerpt of a more than hundred pages.

PANEL CHAIR CADIZ:

Alright.

MR. MUFFETT:

Several hundred pages.

ATTY. MAYO-ANDA:

Several hundred pages.

PANEL CHAIR CADIZ:

The manifestation is noted, but before you proceed, let me go back to my earlier statement… the GGGGG Exhibit to GGGGG-35 which you just amended earlier…

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

The original will be submitted to our Clerk of the Panel.

ATTY. MAYO-ANDA:

Yes.

PANEL CHAIR CADIZ:

And photocopies will be submitted to the Commissioners.

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Thank you. You can now proceed.

ATTY. MAYO-ANDA:

You may proceed now, Carroll.

MR. MUFFETT:

Thank you, Honorable members of the Commission. My colleagues and I have now testified before the Commission on two previous occasions and provided extensive previous documentation. My goal with this testimony is not to repeat that documentation or that testimony. What I would like to do instead is to take a deeper look at some critical documents and what those documents mean about the recurring issue in this hearing of the foreseeability of the harms that have arisen in the context of climate change and in the specific context of harms within the Philippines. I want to note again that the documents that we provided here are only a snapshot, a representative snapshot of an increasingly voluminous documentary record. And that much more importantly, the documents we provided here are only what we believe is a small sample of the true documentary history of these issues; much of which lies hidden in the corporation's own archives. One of the first questions that arises is, "Were the issues of climate change and more generally the risks of carbon dioxide, included in the company's products, foreseeable for fossil fuel producers and when did those risks become foreseeable?"

As we have previously noted and as Geoffrey Supran alluded in his own testimony, we can now document clearly that the oil industry was doing its

own research into climate relevant issues by no later than 1957. And that by the late 1950s and early 1960s, they had been repeatedly warned about climate impacts from both internal and external sources.

But I want to focus on a seminal document in this process that came from the Stanford Research Institute in 1968. Two (2) scientists, Elmer Robinson and R.C. Robbins, submitted a final report to the American Petroleum Institute on the "Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants of Interest to the Oil Industry."

This was the final report that summarized several years' worth of research at SRI and other organizations on behalf of API. In that report, in a section addressing carbon dioxide in the atmosphere, Robinson and Robbins noted that CO_2 emissions are the only air pollutant which has been proven to be of global importance to man's environment on the basis of a long period of scientific investigation. This is 1968. They noted that while there were other possible sources for the additional CO_2 that was being observed in the atmosphere at that time, none of those sources seemed to fit the presently observed situation as well as the Fossil Fuel Emanation Theory. *(I realize, I'm not forwarding the slides. Sorry.)* They further recognize that if CO_2 levels continue to rise at present rates, it is likely that noticeable increases in temperature could occur and that changes in temperature on a worldwide scale could cause major changes in the Earth's environment over the next several hundred years, including changes in the polar ice caps.

They continued that, "there seems to be no doubt that the potential damage to our environment could be severe and that the prospect for the future must be of serious concern." Finally, they noted the irony that with CO_2 being the most abundant pollutant coming from fossil fuel production and combustion, that CO_2 was being ignored even though it might be the cause of serious worldwide environmental changes. They observed that past and present studies of CO_2 were detailed and that those studies seemed to adequately present the state of CO_2 in the atmosphere. As a result, they noted that what is lacking is the application of these data to air pollution technology and work towards systems in which CO_2 emissions would be brought under control. The year was 1968.

The following year, Robinson and Robbins prepared a supplemental report, again at the request of the American Petroleum Institute. This report took a far deeper and much more extensive look at CO_2 at carbon dioxide science, at climate science, and at the risks involved. This important report, I want to acknowledge, highlighted uncertainties to a greater extent than the previous report. Nonetheless, its core conclusions were the same. And, even more importantly, it provided far greater substantiation to those core conclusions. Notably, it estimated that fossil fuel combustion at that time accounted for eighty-nine percent (89%) of global CO_2 emissions. This goes to the question you raised earlier of the role of fossil fuel combustion as opposed to other

sources. The 1969 supplemental report estimated, documented, the average CO_2 emissions to the atmosphere over the preceding century and showed a steady and increasingly dramatic rise in those emissions. And they observed that very nearly half of the CO_2 being admitted into the atmosphere was remaining there. Thus, the industry's own scientists documented that emissions were rising, they had been rising for a very long time, that those emissions were coming predominantly from fossil fuel sources, and that at least half of the CO_2 entering the atmosphere was not leaving. They confirmed their previous findings that, on the basis of present knowledge, significant temperature changes could be expected to occur by the year 2000 as a result of increased CO_2 in the atmosphere.

These could bring about long-term Climatic Changes. And they re-emphasized that it seems ironic that, in air pollution technology, we are seriously concerned with small-scale events while ignoring abundant pollutants such as CO_2, which while we generally ignore because they have little local effect, may be the cause of serious worldwide environmental changes. While they were unsure as to what these long-lived pollutants could do to the environment, there seems to be no doubt that the potential damage to our environment could be severe. The industry received this report nearly fifty (50) years ago.

What does this mean for the issue of foreseeability? It means that fifty (50) years ago the following risks were foreseeable to the oil industry with regard to its products. That CO_2 was the most abundant waste product of fossil fuel combustion other than water vapor. That atmospheric CO_2 had been rising for decades. That fossil fuel combustion was the most likely culprit. That the temperature effects of CO_2 were well known and clearly proven in laboratory experiments. That the long-term global rise in temperatures appeared to be linked to CO_2 rise and fossil fuel combustion and that continued CO_2 emissions from fossil fuels created risk of significant changes to global average temperature. Finally, that potential environmental and social consequences would be severe, and that delaying action until science was certain could lead to unavoidable impacts.

For five decades, these risks with regard to their products have been foreseeable and indeed foreseen by the oil industry. What's more important is we can document clearly that oil industry executives at the highest levels of these companies saw and claimed to have read the Robinson and Robbin's reports. An environmental status report from the API on its environmental research in 1972 references the documents in multiple places and notes that they've been circulated to the relevant committees. But more importantly, and I will note in this regard that at the time these documents were circulated, many of the current Carbon Majors were already API members, including Total, Aramco, British Petroleum, Suncor, Conoco, Chevron, Marathon Oil, Shell, and of course ExxonMobil. Even more significantly, a number of

industry executives claimed not only to have read these documents but have relied on them in a report to governmental authorities in the United States.

In a report submitted to the U.S. government in 1972 on environmental conservation efforts of the oil and gas industries, API executives and oil industry executives specifically referred to Elmer Robinson and R.C. Robbins as eminent scientists. And they characterized their 1968 and 1969 reports as a careful study of the sources, abundance, and fate of air pollutants. And, indeed, in the majority of their reports on air pollutants, the oil industry relied heavily on the Robinson and Robbins report; the exception was with respect to climate change. Having received these clear warnings from their own scientists with respect to climate change, the oil industry expressly ignored those warnings and downplayed them in its report to the government relying instead on a separate report which reached a very different conclusion arguing that the hypothesis that an increase in carbon dioxide will increase global temperatures is by no means proven. And asserting, in almost direct contradiction to the warnings of their own scientists, that as far as global implications are concerned, it seems a justifiable conclusion that there will be no possibility of establishing whether or not a serious problem exists until at least the turn of the century.

In 1972, when this report was issued the following carbon majors companies claimed to be members of the committee that prepared the report – Mobil Oil Corporation now ExxonMobil, Gulf Oil now Chevron, Phillips Petroleum now ConocoPhillips, Standard Oil of Indiana now BP, Humble Oil now ExxonMobil, Texaco now Chevron, and Shell Oil. By 1982, and as Geoffrey Supran alluded earlier, the companies were explicitly acknowledging the growing scientific consensus in their own internal documents. In 1982, an internal Exxon memo acknowledged the clear scientific consensus regarding the effect of CO_2 rise on global temperatures. It acknowledged the unanimous agreement in the scientific community that this would bring about significant change in Earth's weather, climate, and biosphere. A 1988 report, an internal report, by Shell went further and into far greater detail. Shell's internal study in 1988 entitled "The Greenhouse Effect" acknowledged the physical consequences of climate change including rising sea levels, ocean acidification, changing agricultural patterns, and Climatic Change. The report also acknowledged potential social, economic, and political consequences of these environmental impacts.

Finally and fundamentally, "The Greenhouse Effect" report contained a calculation by Shell of its own contribution to historic carbon dioxide emissions noting that Shell has contributed approximately four percent (4%) of the total. This is particularly noteworthy in light of the subsequent work by Rick Heede on the carbon majors and others which have calculated the contributions of these companies to global emissions on a historic basis. The calculations by Shell demonstrate that the methodology as used by Heede are

not unlike methodologies that were being applied by the companies themselves and that allowed the companies to assess their own contributions to this problem on a global scale. In "The Greenhouse Effect," Shell concluded that climate change was mainly due to fossil fuel burning and deforestation. And that as a result, CO_2 concentrations had already increased some fifteen percent (15%) – to three hundred forty parts per million (340 ppm) – by 1988. The most sophisticated geophysical computer models predict that such a doubling could increase the global mean temperature by one point three to three point three degrees Celsius (1.3-3.3°C).

Shell also acknowledged that if this warming occurs, it could create significant changes in sea level, ocean currents, precipitation patterns, regional temperature and weather. And these changes could be larger than any that have occurred over the last twelve thousand (12,000) years. These fast and dramatic changes would impact on the human environment, future living standards, and food supplies; and could have major social, economic, and political consequences. They recognized that there was reasonable scientific agreement that increased levels of greenhouse gases would cause a global warming, and while they acknowledged uncertainties, they warned that by the time global warming becomes detectable, it could be too late to take effective countermeasures to reduce the effects or even to stabilize the situation. This is a critical acknowledgment in light of the industry's subsequent insistence on resolving every conceivable uncertainty about climate change before taking any action.

No later than 1988, you have major oil companies recognizing that if you delay until certainty is absolute, you will have delayed too long. As I noted, Shell recognized that by 1988 it was contributing four percent (4%) of global CO_2 emissions from combustion. Notably, in the context of this Inquiry, Shell was calculating that contribution on the basis of the group as a whole not any one Shell subsidiary. Three (3) years later, in 1991, Shell released an educational film called, "Climate of Concern." This film is remarkable and significant because it demonstrates the degree to which the company has understood and foreseen not only the risks of climate change, but the specific hazards that could emerge and the particular plaintiffs that might be affected by those hazards. "Climate of Concern" acknowledges that the climate might change too fast for life to adapt without severe dislocation. It acknowledged the increasing frequency of abnormal weather, sea level rise, increasingly destructive storm surges, noting that warmer seas could make such destructive surges more frequent and even more ferocious. It warned of the displacement of people living on low-lying islands and of the prospect for greenhouse refugees displaced by shifting climates. If the weather machine were to be wound up to such new levels of energy, warned Shell, no country would remain unaffected. And so, by 1988 to 1991, it's clear that the foreseeable hazards for these companies included rising global temperatures, sea ice melts, rising sea levels, potential inundation of low-lying areas, threats to

populations within fifty kilometers (50 km) of a coast, changes in rainfall patterns, effects on agriculture and fisheries, changes to species distributions, stronger storms, and more severe extreme weather events.

These foreseeable hazards give rise in turn to foreseeable victims that should have been within the compass of the company's knowledge and the company's conduct from that point forward. Those victims included low-lying countries and coastal areas which the companies recognized as uniquely vulnerable. As I noted, Shell had recognized in its 1988 report that people within fity(50) miles… fifty(50) kilometers of a coast would be particularly vulnerable to inundation and flooding. Recent regions already subject to severe storms could be threatened by more severe storms. Economies reliant on agriculture and fisheries could be affected, and poorer countries were at greater risk than wealthy ones. Global warming is not yet certain, Shell acknowledged in 1991, but many think that to wait for final proof would be irresponsible. Action now is seen as the only safe insurance. That recognition in 1991, nearly three (3) decades ago, provides a serious basis for inquiry into what conduct Shell and other companies have engaged in the ensuing three (3) decades.

When we look at issues of foreseeability in the context of tort and in the context of human rights, it is not necessary that a plaintiff and a plaintiff's harms be specifically foreseeable to a defendant. It is sufficient under the second law, the second restatement of torts and the third restatement of torts, and under the law of most jurisdictions that a plaintiff's harms fall generally within a category of risks that were foreseeable according to companies. In this, it's not necessary in my view that Exxon and Shell and other oil companies have had precise foresight into the specific harms that would have occurred in the Philippines. It's sufficient that the Philippines has low-lying areas, coastal areas, economies that are dependent on agriculture and fisheries, and that it lies in extreme storm zones. All of this should have put the companies on notice that the Philippines and similarly situated countries could be affected by climate risks. But the truth is the companies did have more cause to be aware of the Philippines. Why? Because they have operated in the Philippines, many of them for a century. That is a century of understanding the Philippines, its geography, its geology, its culture, its people, and its vulnerabilities.

How do we know this? By the 1930s and forties, oil companies were actively interested in the development of oil fields throughout Southeast Asia and Oceania. This isn't surprising when we recognized that commercial exploitation of oil resources began most actively in Indonesia. This region has long been viewed as a hotbed for oil exploitation and it's long been viewed as an area of great interest to the oil industry. Not surprisingly, therefore, a report on oil development in the Far East in 1960 noted that, with respect to the Philippines, there were active or applied concessions held by a number of

current carbon majors including Exxon, Chevron, and ConocoPhillips, among others. Those leads continued to be explored over the ensuing years. As early as 1938 in fact, reports on the search for petroleum in the Philippines were noted with interest by Standard Oil of California, now Chevron, in numerous geographic areas including, I would note, Leyte.

Those same reports noted that Standard Oil and Standard Vacuum, now ExxonMobil, had applied with the government to do a geographic assessment of numerous provinces including Leyte, Cebu and approximately half of the one hundred fourteen thousand square miles (114,000 mi^2) of the Philippines. Why do I reference this? Because that sort of interest gave the companies adequate means of understanding that there were numerous low-lying areas in the country and indeed it is those low-lying areas that were often of greatest interest to oil prospectors because they are often the ones most associated with oil.

It shouldn't be surprising then that Esso, Shell, Chevron, Texaco, and others continued to operate actively in this company across the ensuing decades not only in refining but in marketing to the Philippines people. And so, the question arises, should the people of the Philippines have come within the compass of this company's concern? Were the citizens and the consumers of the Philippines foreseeable victims of climate harms? Do we have any evidence that these companies were aware of the geology, the sociology, the economy, and the culture of the Philippines? We do. Were the people of the Philippines foreseeable victims of climate harms? Beyond any doubt, they were for decades.

So what do we know? The Majors, including Chevron, Shell, and ExxonMobil, have operated in the Philippines for more than a century. They had early and active interest in Philippines geology due to oil prospects here and they have maintained marketing and operation in the Philippines for at least half a century.

In light of all of this, it is now clear that the hazards to the people of the Philippines and the hazards to people around the world were abundantly clear to the oil industry throughout the past several decades. As Geoffrey Supran testified, we've seen evidence that notwithstanding their awareness of those hazards, the oil industry embarked on a widespread and well-funded campaign of disinformation in the United States and beyond. A question was raised earlier regarding whether Exxon acted alone in these disinformation campaigns. CIEL's research demonstrates emphatically that it did not. Whether through membership in theAmerican Petroleum Institute or the Western Oil and Gas Association or in misinformation or in front groups and think tanks in Europe and beyond, Chevron, Shell, British Petroleum, all have been active in climate denial and obstruction efforts over time. During the

course of my last testimony, I was asked to address the role or contribution of the companies in obstructing the deployment of cleaner energy technologies. And so, in my final words, I want to say just a bit about that and what we know. I want to emphasize that CIEL's own work on these issues, CIEL's own research into the numerous patents these companies held and what they did with those patents is ongoing and in its early stages. Nonetheless, I can share these preliminary findings from our work. It's worth noting that against the backdrop of what the oil industry knew and the rising warnings it was receiving about climate risks in the early 1960s.

In 1967, the chairman of the American Petroleum Institute testified before the US Congress in a hearing, actively opposing funding for new electric vehicle research. I want to emphasize that Congress was considering this funding and considering the research into electric vehicles precisely because of concern about pollution and air pollution arising from vehicles. The API and the oil industry emphasized, successfully I will say, to Congress that there was no need for dedicated research into electric vehicles because by the time electric vehicles became viable, the industry would have already produced clean-burning, pollution-free vehicles. Notwithstanding that commitment to Congress which successfully blocked congressional investments into electrical vehicles in the 1960s, what we see is that the industry immediately moved to actively oppose measures to lower those same emissions that it told Congress it was going to eliminate.

When the U.S. Congress adopted corporate average fuel economy standards in 1975, the first standards of their kind to require greater fuel economy and less fossil fuel combustion for vehicles, API and the entire oil industry actively opposed those standards. And they have continued to oppose those standards for the ensuing decades up to and through the Trump administration. The oil industry has at the same time continued to develop or purchase and exercise control over patents in numerous areas of renewable energy. I want to focus on two (2) examples, even as the oil industry opposed the adoption of safe standards which would make fuel-burning cars more efficient, it continued to work to undermine the proliferation of electric vehicles in states across the country.

In 1994, for example, as California was working to expand the use of electric vehicles in that state, an active well organized and extremely well-funded citizens group called "Citizens Against Utility Abuse" began launching a widespread campaign against subsidies for electric vehicle fueling stations. An investigation by the Los Angeles Times found that this citizens' group was in fact a front group operated by the Western Oil and Gas Association. At that time, ExxonMobil, Shell, Chevron, and others were all members of the Western Oil and Gas Association.

I say that as a preface to this next slide because while there are things that we know and can demonstrate with respect to the oil industry and its engagement on these issues, there are other things where we have only suggestive information, evidence that tells only part of the story. In 2006, a documentary called "Who Killed the Electric Car?" examined efforts by the oil industry, utility industries, auto industries, and others to kill electric vehicles in California and across the United States. In the course of that documentary, they uncovered a patent that had been developed by a company named Ovonyx in the late 1990s. That patent promised breathtaking and breakthrough technology in electric vehicles. As a result of which, there was a great deal of excitement about Ovonyx and the opportunity that it created to accelerate the deployment of electric vehicles nationwide. Soon after, the patent was developed and before it could be effectively commercialized, it was bought up first by General Motors and soon thereafter by Chevron. Chevron continues to own that patent to this day. There have been allegations that it has entangled the patent to prevent its deployment. Whether those allegations are true remains unproven. Yet it is clear that this once promising technology has lain effectively dormant for more than a decade.

We see a similar trajectory with industry control of the solar industry. Beginning in 1974, the U.S. Congress enacted the "Solar Energy Research Development and Demonstration Act" with the goal of making significant development, significant investments in renewable energy research particularly research into solar energy, with the goal of accelerating the deployment of solar energy nationwide in the face of an energy crisis. When Congress adopted those subsidies, what our research reveals is that in the ensuing years, oil companies monopolized the majority of the funding that was going to solar energy research. As a result of which, by the late 1980s, oil companies controlled the majority of solar energy production and solar energy patents in the United States. What happened? Almost nothing. By that I mean that solar energy which had in the late 1970s and up to the early 1980s appeared to be on a promising and rapid trajectory went dormant for more than a decade. What is clear is that when solar energy began to pick up again in the late 1990s and early 2000s and once again began to spread in deployments, neither the technology nor the cost had changed substantially from where it existed in the late 1980s. And I will leave it at that.

ATTY. MAYO-ANDA:

Your Honors, can we be allowed a few questions? Thank you, Carroll, for such incisive and enlightening presentation. Just two (2) questions. You mentioned in your Statement about Philippine consumer laws, and I was wondering if you can elaborate on the significance of our consumer laws in relation to determining foreseeable risks in a company's products.

MR. MUFFETT:

As a note in my Statement, I'm not an expert in Philippine law and I'm not licensed in the Philippines. For me, what is instructive about the consumer laws in the Philippines is they reflect the general trend of laws in this area worldwide, and most notably the Consumer Act in the Philippines, which applies strict liability in most circumstances to companies who produce or market a product when harm occurs as a result of the use of that product. That strict liability exists for a reason – it acknowledges the disconnect between the information available to the companies that bring a product to market and the information that is available to consumers. As a result of which, it is recognized that companies are and should be experts in every aspect of their products; whereas, consumers have the right and the need to rely on companies for that expertise and to rely that when companies bring something to the market, they are guaranteeing that it is safe, when used as directed. The truth is that history has proven, and it was completely foreseeable, that fossil fuels are not safe when used as directed.

CO_2 is an intrinsic unremovable, intrinsic inescapable hazard from fossil fuel combustion. When authorities looked at the issue of foreseeability, they have recognized that the reason behind strict liability and the reason behind fellow to warn laws is that consumers have the right to make an informed choice. In other words, consumers have the right to make a choice that this product is safe for me or they have a choice to say I can't control how safe this product is and the only way I can control how hazardous it is or not is to select how much of it I use. The consumer protection laws of the Philippines are important for another reason in this regard because they recognize that the failure to disclose those risks or the mischaracterization of those risks, or misleading consumers about intrinsic hazards, is in fact a form of fraud, and I think this is instructive because it speaks to the disconnect between companies on the one hand exercising this incredible authority over the information that we all received.

On the other, actively encouraging people for decades to believe that climate change was not a problem, and that fossil fuels were not to blame and now as climate impacts become abundantly clear all around saying, "Well, yes, climate change is occurring and consumer choice is the problem." If consumers did not have the option of making informed choices and if the companies themselves actively worked to undermine those options, and undermine those informed choices, they can now argue that the cause of climate change is hosts of individual actions by people who didn't have the information that the companies had.

ATTY. MAYO-ANDA:

Thank you. And my last question is you mentioned about the "Climate of Concern" by Shell. Could you elaborate further on the significance of that film in relation to the national Inquiry, particularly on the potential foreseeable consequences of people in vulnerable situations in the Philippines?

MR. MUFFETT:

Yes, and I actually want to go back to that slide… the "Climate of Concern" is significant because it demonstrates with great particularity that the harms that were suffered here and the harms that are being suffered in similar places around the world were not only foreseeable, which is what the law requires – that they be foreseeable – but they were in fact foreseen, that the companies had actual knowledge that their present practices, if continued, these harms would likely result. And these harms included harms to low-lying islands, they included more severe storms, higher storm surges, you know an unleashed weather machine. What this demonstrates is that for Shell and ExxonMobil and others, these companies were taking a calculated risk with the lives and the livelihoods and the property and the communities of people around the world. In 1991, Shell recognized that risk, and yet for the ensuing decades, Shell and other companies continued not only to support misinformation campaigns but to actively work to expand and perpetually increase their production of fossil fuels, and to open new horizons and new frontiers in oil production, a practice that continues to this day.

ATTY. MAYO-ANDA:

Thank you, Carroll. Your Honors, if you have questions...

PANEL CHAIR CADIZ:

Thank you very much.

Commissioner Gwen, do you have questions to field to our witness?

COMM. PIMENTEL-GANA:

Well, just further clarification on what you were saying earlier that the Philippines is actually affected by climate risk considering that the Philippines has a lot of low-lying areas, is that correct? An assumption that you were saying…

MR. MUFFETT:

The fact that there are low-lying areas in the Philippines is one of many ways in which the Philippines is affected by climate change.

COMM. PIMENTEL-GANA:

Ah, okay.

MR. MUFFETT:

And there are also many mountainous areas in the Philippines obviously, but as experience in Leyte and other places demonstrate, coastal areas are particularly vulnerable to inundation of this kind, and at the same time the Philippines is also at risk because it lies at the epicenter of major storm paths and that has not been a secret to anyone for many decades.

COMM. PIMENTEL-GANA:

And then what you're saying is that considering that the Philippines is a country that is exposed to great risk because of this, what are the carbon majors doing? You are saying that there need not be any direct evidence of action that these carbon majors do in the Philippines. It's okay because of the element of other risks that the Philippines is exposed to? Is that it? Or they need to show positive action on their part?

MR. MUFFETT:

The harms that are occurring in the Philippines are the result of the combustion of fossil fuel in the Philippines and worldwide. It is very difficult to disaggregate the combustion of fossil fuels in the Philippines from the combustion of fossil fuels worldwide. The combustion of fossil fuels in the Philippines would be a tiny fraction of those emissions. And yet, the companies recognized that the harms and the risks of climate change would not fall evenly across the planet and they wouldn't fall disproportionately where the carbon was earned. It would fall hardest on low-lying countries, on countries, with a lot of coastline. They would fall hardest on countries that are exposed to sea level rise or exposed to extreme storms and countries that were more dependent on agriculture and fisheries, and finally poorer countries would be more vulnerable. All of these were foreseeable and all of them, all of the climate victims who fell within those categories, were the foreseeable victims for these countries, for these companies. Thus, does it matter? I want

to mention that recently a US Court rejected jurisdiction in a climate case in the US on a ground that I consider remarkably nearsighted and completely unsustainable.

In rejecting the claims of California City plaintiffs to suits against these same Carbon Majors, a single judge in California said that we don't have jurisdiction under US laws because you can't prove that the conduct of these companies in California alone was sufficient to give rise to this harm. That is a remarkably nearsighted and ultimately unsustainable way to assess harms that are truly global in their nature, global in their origin, and global in their impacts. And particularly in a case where a country is disproportionately affected by emissions that have occurred in many places around the world, the Philippines is affected to a far greater extent by emissions that have occurred worldwide than by emissions that have occurred here in the country. But I also want to acknowledge that these companies did conduct business here, they did market to Philippines consumers, and the question arises, did they reveal to Philippine consumers the hazards that they didn't reveal to consumers in every other country in the world? If in fact Exxon and Shell can say… and Chevron Texaco can say to the Philippines well, yes, we sold oil and gas here in the Philippines, but we told you in the Philippines that these were the harms that were going to result, that might be a quite different analysis. But that would be a remarkable deviation from the evidence that we've seen today.

PANEL CHAIR CADIZ:

Commissioner Karen, do you have any questions for the witness?

COMM. GOMEZ-DUMPIT:

Thank You, Carroll. Again, I'm going back to the documentary film, an educational film you said in 1991, "Climate of Concern," and you quoted a portion of it which says, "Action is seen as the only safe insurance." So this was produced by Shell and have you tracked at least the actions of Shell after declaring this in this particular video? And have they instituted measures in terms of their operation or at least in their corporate social responsibility programs where you see that they're heeding their own advice about action as a safe insurance?

MR. MUFFETT:

Shell certainly took action to protect its own infrastructure and its own investments from the risk of climate change including in the late 1980s by raising its own oil drilling platforms to protect them from sea-level rise. But

if the question is "Did shell take action to conform its own conduct and its own operations to the warnings in Climate of Concern?" It did not. It is abundantly clear that Shell for the ensuing decade continued to be an active funder and participant in misinformation campaigns operated by the Western Oil and Gas Association, the American Petroleum Institute, the Global Climate Coalition, and others. In addition, I think the most compelling evidence that Shell has failed to consider these risks is that Shell continues to operate on a business model that is centered on the perpetual growth and expansion of its production of fossil fuels. This is most notable in the Sky Scenario that Shell released earlier this year.

The Sky Scenario was released with a great deal of fanfare and it was Shell's argument that here is Shell making a positive contribution to the climate discourse, decades after we, Shell, have been aware of climate risks. And yet the Sky Scenario has a number of failings. As I detail in my Statement, it is not in fact aligned with the Paris goals in any meaningful sense. Much more importantly, the Sky Scenario relies on assumptions that are unproven and dangerous with respect to the deployment of carbon capture and storage technologies and the reliance on BECCS, which is Bioenergy with Carbon Capture and Storage, which itself would have a number of human rights implications. Much more fundamentally, however, Shell's commitment to the Sky Scenario is belied by the legal fine print in the scenario itself, which clarifies that Shell had at the time of issuing the report, no present plans to change its own investment or operations to accord with the scenario.

COMM. GOMEZ-DUMPIT:

Thank you.

PANEL CHAIR CADIZ:

Father Walpole.

DR. WALPOLE:

Thank you very much for this presentation and the years of work that has gone into it. I just wanted to go through a few points, you've covered many already. Page five (5), fifty percent (50%) of the carbon dioxide that goes into the atmosphere stays there basically as greenhouse gas, where does the other fifty percent (50%) go? It goes into the ocean, it gets absorbed into vegetation? What's the scenario there?

MR. MUFFETT:

Yes, that's correct. There is a natural absorptive capacity for carbon dioxide in the world. Carbon dioxide is a natural part of the Earth's energy balance and this has long been recognized. But that natural absorptive capacity has limits. This is what's kept the earth in balance for millions of years. The problem with carbon dioxide emissions is that it drives that balance out of whack. And so, a portion of carbon dioxide is soot (which) is taken up in grass, and pastures, and forests. Part of it is entered in soils. A portion of it over, you know, long periods of time will be embedded in rocks and limestone. Which is ultimately why cement is a source of emissions and then a significant portion is taken up in the oceans over time. But it's worth noting that the capacity of the oceans to absorb this carbon dioxide has proven far more limited than scientists initially projected. And those limitations themselves were more recognized in 1957 by Revelle (Roger Randall Dougan Revelle) and recognized soon thereafter by ExxonMobil and its own scientists.

FATHER WALPOLE:

Thank you. Going on, what is clear to me, if you will correct me, is that by 1997 the misinformation began certainly with government. Yes? With how companies reported to government. What we see by the ACS is a misinformation and nearly the development of a media campaign; so the strategy really changed.

MR. MUFFETT:

My assessment is that, you know, I want to look back a bit earlier. The name Smoke and Fumes has its genesis in the Smoke and Fumes Committee that was created by the Western Oil and Gas Association in 1947, and the API's Smoke and Fumes Committee is essentially a continuation of the same operation. That Smoke and Fumes Committee was created with the express purpose of combining science and active public relations campaigns to inform public perceptions of environmental pollution research, particularly in the context of air pollution. I mention that because our research into the early operations of the Smoke and Fumes Committee on a variety of pollutants, including smog, demonstrate a nearly identical pattern of conduct. From our perspective, this pattern of conduct is largely uninterrupted from the 1940s onward.

The pollutants that they chose to focus on varied over time. From my perspective, the 1972 communication to the U.S. government in which the industry, on the one hand, argued that their scientists were imminent and had done a comprehensive analysis and, on the other, refused to share with the

government that analysis when it came to climate change, that is deceptive. From the 1980s onward, the industry was funding a variety of groups that were operating misinformation campaigns primarily targeting the public, as Geoffrey also alluded. And from very early on they started targeting policymakers responsible for setting climate relevant policies. That targeting began certainly by the 1980s.

DR. WALPOLE:

What was said earlier on that Exxon and other corporation's production has dropped since somewhere in the seventies and eighties, if I remember rightly, as Saudi and state or country corporations, country producers, took over and that certainly has risen to greater heights. So in this process, has there been any discussion or any communication with these other corporations outside of the U.S.?

MR. MUFFETT:

I think there are a few things to note. I think it's a very important question and the first thing that I observed, and Richard Heede alluded to this to a significant extent, what we saw was not a dramatic decrease in the production by the Carbon Majors but rather an in crease in production by state actors and state-owned enterprises. There is an aspect of this that has received very little attention but it is very important. If you look at the history of Saudi Aramco, Saudi Aramco was actually formed and operated by the Carbon Major companies for the majority of its life and the Carbon Major companies continued to be service providers to actually help Saudi get the oil out of the ground and market it for decades thereafter. In a similar way, Shell particularly played a substantial role in China's accessing and developing its offshore oil resources just as ExxonMobil played a tremendous role in Russia's developing and commercializing its own offshore oil assets. I say this because it is true that the production of oil and gas from state-owned enterprises and from States has increased and is a subject of concern. But that neither ameliorates the responsibility of the carbon major companies, nor does it detract their contribution to the problem. And in fact, they've been significant contributors to the problem even when it comes to state-owned enterprises.

The final point that I would make is that any production of fossil fuels is unsustainable and irresponsible. But the position of a private corporation operated for profit is fundamentally different than the position of a state that operates its oil reserves on behalf of an entire people for an array of complex reasons. I think it is for this reason that we have focused on the actions of investor-owned companies whose motivations, whose ability to control their

actions are, I think, much clearer than in the case of states. This doesn't alleviate the responsibility of states in any way, but the responsibilities of states, whether as producers of oil or as consumers of oil, are different in an important way from those of investor-owned corporations. I will say that state-owned enterprises sit in a middle ground – a fact that is made abundantly clear by the litigation or that litigation risk that Saudi Aramco faces if it were to decide to go public, which it considered. And it delayed doing so, in part, because of the risk that by becoming a public corporation, it could be sued for its actions. And I will say that there are other state-owned enterprises such as Statoil where the environmental community and people like myself have engaged very actively with regard to their responsibilities to reduce their investments in production.

DR. WALPOLE:

Thank you, thank you very much.

PANEL CHAIR CADIZ:

You stated earlier about the obstruction of the private carbon majors in regard to the deployment of cleaner air technologies by all companies. Do you sense that there is still such an attitude of obstructionism on the part of the private carbon majors even today? Are they still trying to obstruct transition from traditional carbon fuels to renewable energy?

MR. MUFFETT:

Well, I think one clear example of that is in their continued opposition to stronger fuel efficiency standards. Standards that would make even existing internal combustion engines less polluting. They have opposed them very actively. Certainly, efforts in the U.S. to expand renewable energy have been met with consistent opposition from U.S. industry groups, with the oil industry being a very active part of that opposition. So do I think that they are continuing to oppose the deployment of renewable energy? I think, as Geoffrey Supran alluded, it is increasingly difficult to track their activities because of the use of dark money beginning in around 2008, oil companies and others seemingly began to direct a lot of their resources through channels that are difficult to trace. So the degree to which they are continuing to obstruct action on renewable energy is difficult to quantify at this stage. But there are certainly repeated examples where we can demonstrate they have done so.

PANEL CHAIR CADIZ:

You tried to make a distinction earlier between state-sponsored or state-owned carbon companies or businesses versus privately-owned carbon majors. But would you not say also… and you said that it would seem that the privately-owned carbon majors would be more responsible…should be held more accountable for their actions as against state-owned companies. But would you not say that they are equally complicit with the private carbon majors, insofar as they have allowed these businesses to operate with profit within their jurisdictions?

MR. MUFFETT:

We see around the world, where governments are subsidizing and supporting fossil fuels, that they are increasingly being litigated against in very similar ways and I think that is completely appropriate. Absolutely. And I think the use of the word "complicity" is important in the United States. One of the most important pieces of climate litigation that is going on right now is focused on the U.S. government and the actions of the U.S. government with respect to climate change; they are "Our Children's Trust" litigation. But it's important to note that the oil industry actually sought to intervene as defendants in that case because of their concern that the case threatens their fundamental business model.

Much more importantly, you know, many of the core claims in the case rest on the fact that U.S. government agencies and U.S. political actors have for decades, and in violation of their responsibilities to U.S. citizens and to citizens around the world, actively promoted the production and combustion of fossil fuels. And so, absolutely, where there is government complicity in that conduct, it should be investigated and were necessary litigated. My point was simply that the situation of government actors is often distinct from that of a private actor. But that distinction doesn't relieve governments of their responsibilities with respect to climate change.

PANEL CHAIR CADIZ:

I have no further questions.

Counsels, what is your pleasure?

ATTY. MAYO-ANDA:

That is all, Your Honor, for Mr. Carroll Muffett. Thank you, Carroll.

PANEL CHAIR CADIZ:

So, the witness is now excused. Thank you very much, Mr. Muffett, for your very enlightened discussion of the topic.

ATTY. PAUDAC:

Your Honors, may we be allowed to make a manifestation in relation to the earlier testimony of Mr. Richard Heede with regard to the Greenpeace funding?

PANEL CHAIR CADIZ:

Okay.

ATTY. PAUDAC:

We have here Atty. Kristin Casper of Greenpeace International to enlighten us with that, Your Honor.

PANEL CHAIR CADIZ:

So, you are calling another witness to do…

ATTY. PAUDAC:

No, not in the witness stand, Your Honor, just here for the manifestation.

PANEL CHAIR CADIZ:

Alright.

ATTY. CASPER:

Thank you, Your Honor. I just want to clarify and explain a few things that came up during Mr. Richard Heede's presentation. So I'm just going to read this if that's okay.

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. CASPER:

I understand that Mr. Heede started working on the Carbon Majors research as early as 2003 or 2004, and Friends of the Earth and Climate Justice Program commissioned the ExxonMobil research in 2004. Mr. Heede worked with Mr. Peter Roderick of the Climate Justice Program on the ExxonMobil research in 2004 and later with Stephen Leonard and Keely Boom on the publication of the carbons majors' research beginning about 2011. As an independent researcher, Mr. Heede submitted an article on the Carbon Majors to the journal Climatic Change on the 5th of March 2013. This article was accepted by the journal on the 14th of October 2013.

The Guardian published the first news article on the Carbon Majors research on November 20th 2013 and on November 22nd 2013. Mr. Heede's peer-reviewed article on the Carbon Major's research was published online in the journal Climatic Change. The title of this article is "Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854 to 2010." This is marked as "VVVV" to "VVVV-14". The Climate Justice Program and Greenpeace International were not involved in the drafting of the peer-reviewed article. Mr. Heede worked as an independent scientist throughout this process. Separately, Greenpeace International and Climate Justice Program commissioned Mr. Heede to write the "Methods and Results Report" marked as "UUUU" to "UUUU-103." Greenpeace International also commissioned a peer review of the "Methods and Results Report" by Ecofys, a leading consultancy group on energy and climate matters, to ensure the verification of the methodology and results by an independent third party.

Greenpeace offices around the world adhere to very strict quality standards for any research they commission or publish and the credibility of our efforts depend on independent and robust research. Following *The Guardian* article, Greenpeace International issued a statement about Mr. Heede's research and released the first version of the Methods and Results report. Greenpeace International also produced a fact sheet to explain the importance of the research to a lay audience and an updated version of the Methods and Results report; there was just only a change to the cover. The cover page was posted on the Greenpeace International website on April 7th 2014. Finally, Greenpeace Southeast Asia invited Mr. Heede to present his research in "A Human Rights and Climate Change Workshop" held here at the Commission on Human Rights in May 2015. I hope and trust that that clarifies the situation for you.

PANEL CHAIR CADIZ:

Alright. The manifestation is noted, but I would invite... if any of the members of the Panel would like to field questions to the Counsel of Greenpeace who made the manifestation.

Okay. There being none, the manifestation has now been put into record but, especially, the respondents who are not here are properly advised to submit whatever responses they might want in regard to this manifestation and the testimonies provided before this Commission today.

Are there are other matters? Attorney Fernandez?

CLERK OF THE INQUIRY:

Your Honor…

PANEL CHAIR CADIZ:

Excuse me… alright, before you proceed, Commissioner Karen has requested that the manifestation read into the records, "*We also put into writing and submitted before the commission.*"

Attorney Fernandez, you may proceed.

CLERK OF THE INQUIRY:

Your Honor, we have provided the dates and the venues for all the succeeding hearings through the Facebook page of the Commission on Human Rights as well as through other means such as advisories. We have also sent out the notice of the fourth round of Inquiry hearings to be conducted on 27 and 28 September in the Continuing Legal Education Room of the New York City Bar Association at 42 West 44thStreet New York. All questions or inquiries may be sent to nicc.chrp@gmail.com. That is all, Your Honor.

PANEL CHAIR CADIZ:

Yes, we shall continue with our hearing tomorrow. But in relation to the announcement made by Attorney Fernandez, may we remind the counsels for petitioners to submit to us the list of witnesses that they intend to present on 27 September in New York, so that the Panel can also prepare itself for that hearing.

ATTY. PAUDAC:

Yes, Your Honor, we will submit.

PANEL CHAIR CADIZ:

Are there other manifestations, or are there other parties present in this room today who might want to say anything before the Panel?
There being none, the hearing for today is adjourned and we will see the petitioners tomorrow with your second set of witnesses. Thank you very much.

[Bangs gavel]

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

Good morning, everyone.

This third round of 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. 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 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 present for today's inquiry proceedings are:

1. Honorable Comm. Leah C. Tanodra-Armamento
2. Honorable Comm. Gwendolyn Ll. Pimentel-Gana

3. Inquiry Panel Chairman of the NICC, Honorable Comm. Roberto Eugenio T. Cadiz
4. Honorable Comm. 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 and the ecumenical prayer.

[National anthem, Ecumenical prayer]

Everyone may now be seated.

COMMISSIONER CADIZ, CHAIR OF THE INQUIRY PANEL:

[Bangs gavel]

The panel is now in session. It continues to be assisted by Dr. Pedro Walpole, S.J.

Counsels, are you ready to present your witnesses? May you please enter, first, your formal appearances?

ATTY. PAUDAC:

Good morning, Your Honors. Respectfully appearing Hasminah D. Paudac for the petitioners.

ATTY. MAYO-ANDA:

Good morning, Your Honors, respectfully appearing Grizelda Mayo-Anda for the petitioners. We are ready, Your Honors.

PANEL CHAIR CADIZ:

Please call in your first witness.

ATTY. MAYO-ANDA:

Our witnesses for the day are members of the Ifugao tribe. We would like to call Mr. Buucan Hangdaan, Ms. Dalia Naliw, and Mr. William Mamanglo.

PANEL CHAIR CADIZ:

Please swear in the three (3) witnesses.

Three (3) or four (4)?

ATTY. MAYO-ANDA:

Three (3) witnesses, Sir.

PANEL CHAIR CADIZ:

Three witnesses. May we ask our people to provide three chairs for the witnesses?

MR. WILLIAM MAMANGLO:

Ako po si William Mamanglo, ako ay isang tubong Ifugao, at kasalukuyang nakatira sa Bayan ng Banaue, Ifugao. (I am William Mamanglo, from Ifugao, presently residing in the town of Banaue, Ifugao.)

MR. BUUCAN HANGDAAN:

Ako si Buucan Hangdaan, Banaue, Ifugao. (I am Buucan Hangdaan, Banaue, Ifugao.)

MS. DALIA NALIW:

Ako naman po si Dalia Naliw, nakatira po ako sa Banaue, Ifugao. (I am Dalia Naliw. I live in Banaue, Ifugao.)

ATTY. MAYO-ANDA:

May I proceed, Your Honors?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

Mr. Buucan Hangdaan is an indigenous farmer of the Ifugao tribe, residing in the Banaue Rice Terraces. Ms. Dalia Naliw is a culture bearer, and Mr. William Mamanglo is the Project Development Coordinator of the Provincial Planning and Development Office specifically the Ifugao Cultural Heritage Office, and we are offering their testimonies, Your Honors, so that they can share how higher temperatures, intensifying weather events, and other climate impacts threaten the two thousand (2000)-year-old Ifugao Rice Terraces including the communities depending on them. And before we proceed with the presentation, Your Honors, may I be allowed to have certain documents identified?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Magandang umaga po ulit. (Good morning again), I would also like to make this manifestation, Your Honors, that Mr. Buucan Hangdaan, while he can respond to certain preliminary questions, feels comfortable making his presentation in Ifugao, which will be translated by William Mamanglo. *Ginoong Buucan Hangdaan, puwede ninyo po bang suriin ang dokumentong ito? At paki-tingnan kung ito ba ay nakikilala ninyo.* (Mr. Buucan Hangdaan, can you review this document? And please see if you can identify it.)

MR. HANGDAAN:

Oo. (Yes.)

ATTY. MAYO-ANDA:

Nakikilala po ninyo ito? (Can you recognize this?)

MR. HANGDAAN:

Oo. (Yes.)

ATTY. MAYO-ANDA:

Sa pangalawang pahina po nito ay mayroon pong pirma. (In the second page, there is a signature.)

MR. HANGDAAN:

Oo, pirma ko ito. (Yes, this is my signature.)

ATTY. MAYO-ANDA:

This first document, Your Honor, consisting of two (2) pages has been previously marked as "OOOOO." *Salamat.* (Thank you.)

Binibining Dalia Naliw, maari mo bang suriin itong tatlong (3) *pahinang dokumento kung naaalala mo ba?* (Ms. Dalia Naliw, can you review this three (3)-page document if you can remember it?)

MS. NALIW:

Opo, Ma'am. (Yes, Ma'am.)

ATTY. MAYO-ANDA:

Sa pangatlong pahinang ito, mayroon pong, pirma. Pakitingnan po ang pirmang ito. (At the third page, there is a signature. Please see this signature.)

MS. NALIW:

Sa akin po ito. (This is mine.)

ATTY. MAYO-ANDA:

This document, Your Honor, entitled, *"Salaysay ni Bb. Dalia Naliw"* (Statement of Ms. Dalia Naliw) has been previously marked as "Quintuple B."

Ginoong William Mamanglo, paki-tingnan po itong isang dokumento, na nagsasabing "Statement of William Mamanglo," *pakisuri po at pakisabi kung naalala nyo po?* (Mr. William Mamanglo, please see this one document

saying "Statement of William Mamanglo." Kindly review and say if you can remember it.)

MR. MAMANGLO:

Opo, naaalala ko ito. Ito ay sarili kong ginawa. (Yes, I remember this, I made this.)

ATTY. MAYO-ANDA:

Salamat. At ito pong isa ring dokumento, isang (1) *pahina,* curriculum vitae. *Maaari mo bang suriin?* (Thank you, and how about this one (1)-page curriculum vitae, can you review it?)

MR. MAMANGLO:

Opo, ako rin po ang gumawa rito at aking ipinasa. (Yes, I made and submitted this.)

ATTY. MAYO-ANDA:

At panghuli, mayroong isang PowerPoint presentation*, dalawampu't tatlong* (23) *pahina. Pakisuri pong mabuti, at pakisabi kung naaalala ninyo.* (And lastly, there is a twenty-three (23)-page PowerPoint presentation, please review it carefully and please say if you can remember.)

MR. MAMANGLO:

*Oo, naalala ko to. Ako rin po ang gumawa nitong*presentation. (Yes, I remember, I also made this presentation.)

ATTY. MAYO-ANDA:

Now these three (3) documents, Your Honors, which have been identified have been previously marked. The Curriculum Vitae pre-marked as "RRRRR," the "Statement of William Mamanglo" pre-marked as "QQQQQ," and the "PowerPoint presentation of William Mamanglo" pre-marked as "SSSSS".

PANEL CHAIR CADIZ:

Just for the record, Atty. Esguerra, would you confirm the pre-markings of the documents cited by the Counsels?

Alright, please proceed.

ATTY. MAYO-ANDA:

The first presenter, Your Honor, would be Mr. Buucan Hangdaan and he will speak in Ifugao, and his brief presentation will be translated by Mr. William Mamanglo.

MR. HANGDAAN:

Ako si Buucan Hangdaan, galing sa Bangaan, Banaue, seventy (70) years *ako ngayon. Nandoon ako lumaki sa Bangaan, na isang* farmer. (I am Buucan Hangdaan from Bangaan, Banaue. I am seventy (70) years old. I grew up in Bangaan as a farmer.)

MR. MAMANGLO:

I am Buucan Hangdaan. Nakatira po ako sa Bangaan, Ifugao. Ako po ay isang katutubong Ifugao. Noong bata ako hindi ako nakapag-aral, kaya magsasaka sa aming palayan sa rice terraces *ng Bangaan ang itinuro sa akin ng aking mga* parents *at ng aking mga ninuno.* (I am Buucan Hangdaan. I live in Bangaan, Ifugao. I am an Ifugao native. When I was a child, I was not able to study, that was why my parents and my ancestors taught me farming in our rice fields, in the rice terraces of Bangaan.)

MR. HANGDAAN:

Ang pinagtatrabahuan ko pong palayan ngayon ay kasalukuyang isang (The rice fields where I am working is now a World Heritage Site as declared by the UNESCO.

Ang pangunahing tinatanim namin sa aming palayan ay ang aming traditional na palay na tinatawag naming Tinawon. Pero ngayon may pagbabago sa aming mga tinatanim kasi ina-adopt na rin namin ang mga palay sa mga lowland na aming kapitbahay tulad ng Isabela. Ang pagkakaiba po nito ay maganda rin ang mga lowland variety na rice. Pero sa aking tingin, sa haba ng panahon ng pagtatanim ko ng mga lowland rice, naikumpara ko,

at mas maganda pa rin iyong aming Tinawon rice kasi maliban sa mahaba iyong mga palay, ito rin ay mas malaki kaysa palay sa lowland.

(The main crop in our rice field is the traditional rice grain called Tinawon. But now, there are changes because we have adapted the rice grain from neighboring lowlands like Isabela. The lowland variety of rice is also good. But for me, for the longest time I have been planting lowland rice, I think Tinawon rice is still better. Tinawon is just incomparable with its bigger and larger grains.)

Noon, bago kami magtanim sa aming palayan, may mga ritwal kaming sinusunod alinsunod sa mga sinabi sa akin ng aming mga ninuno. Nag-babaki kami, ito ay isang ritwal para sa pasasalamat sa panginoon ng palay. Ngunit ngayon pumasok na ang Kristiyanismo, ito na ay unti-unting nawawala at minsan ay hindi pa namin pinapraktis ang mga ritwal na ito. Kasi maliban sa wala nang gagawa sa mga ritwal ay itong mga ritwal ay medyo mahal din. Costly iyong paggawa ng ritwal.

(When we planted rice before, there were some rituals in accordance with our ancestral practices. We performed "baki" as a thanksgiving to our God of Rice. But since Christianity has set in, this cultural practice is slowly disappearing. Aside from less people who practice it, these rituals are somewhat expensive; they are costly.)

Ang ginagawa din naming fertilizer sa aming mga itinatanim ay iyong sarili mismong stalk ng mga palay. Inilulublob namin sa aming mga palayan at ito'y nagsisilbing fertilizer, para maganda ang ani.

(What we use as fertilizer for our plants are the stalks of rice grain. We bury those in the rice fields and they serve as fertilizer to ensure a good harvest.)
*Noon, talagang pinapahalagahan namin at tinatrabaho namin ang aming mga palayan. Kami ang sariling nag-re-*repair*kung may sira man. Pero ngayon, dahil na rin sa ibang pangangailangan, kailangan din naming minsan lumuwas sa aming lupa para magtrabaho. Sapagkat ako ay may siyam na anak, iniisip ko rin na kailangan din silang pag-aralin. Kaya kung minsan ay iniiwanan ko rin ang aking palayan para magtrabaho para may pera para pangtustos sa pag-aaral ng aking mga anak.*

(Before, we really valued farming and worked hard in our rice fields. We also repaired the damages if there are any. But now, because of other needs, we have to work elsewhere for the needs of my nine children. So sometimes, I leave my rice fields, so that there will be money for my children's education.)

Ang isa ring problema namin ay itong irigasyon. Noon, isang community*na ginagawa namin ito, iyong tinatawag nating bayanihan, batyang sa amin, nagtutulungan kami para i-*repair *iyong mga* irrigation*. Ngayon, kahit*

*nagtatawag ka ng mga tao sa*community*, marami silang ginagawa at ang mga kabataan ngayon ay hindi na interesado sa mga ganitong bagay.*

(Another problem is irrigation. Before, there was '*bayanihan*', '*batyang*' for us, in our community. We helped each other to repair the irrigation facility. Now, even if you call out the people in the community for help, they have other work to do. And the youth today are not interested anymore.)

MR. MAMANGLO:

So *iyon na lang po ang salaysay ni* (So that is the Statement of) Mr. Buucan.

MR. HANGDAAN:

Isa ring pagbabago sa ngayon ay noon nalalaman namin ang ulan at may sarili kaming kalendaryo kung kailan kami magtatanim kasi alam namin na maganda ang panahon. Kaunti lang ang ulan. So nagtatanim kami sa buwan na iyan na alam namin na maganda para itanim, i-transplant namin. Pero ngayon ang problema ismay biglang pagbabago sa panahon. Hindi mo na matantiya kung kailan talaga uulan sa amin na kapag uulan pa dire-diretso at minsan malalakas to the point na hindi na kaya ng palayan ang volume ng tubig na bumabagsak sa aming palayan.

(Another change is that before, we knew when the rainy season would be. We could plan our planting schedule because we knew the period of good weather when it did not rain that much. So we planted on the month when we predicted good weather to plant, and when we need to transplant. But the problem now is the sudden change in weather. You cannot predict anymore when it will rain. When it rains, it is continuous and torrential; sometimes to the point that the rice fields cannot accommodate the volume of water.)

Isa pang pagbabago ay noon, mga alas-singko ng umaga mag-umpisa na kaming magtrabaho sa aming palayan. Papasok kami hanggang sa gabi. Iyong pahinga lang namin is mag-nganganga kami ng mama o magpapahinga. Eh okay. Kapag umuwi kami ay okay ang katawan namin. Ngayon, pumasok kami ng alas-siyete, kailangan alas-onse aalis na kami sa aming palayan kasi iba na ang araw. Kasi masakit na sa aming balat. Iyon po.

(We used to work in our ricefields from about five o' clock in the morning until evening. Our only break was when we chew betel nut or just merely rest. When we went home, we felt fine. But these days, we work at seven but we need to leave the rice fields by 11 because the heat is different. It is painful on our skin. That's it.)

ATTY. MAYO-ANDA:

Salamat po, Ginoong Buucan. *Puwede na po nating tawagin si Dalia.* (Thank you, Mr. Buucan. We can now call Dalia.)

MS. NALIW:

Magandang umaga po sa ating lahat. Ako naman po si Dalia Naliw, twenty-four (24) years old at kasalukuyan po akong nagtatrabaho sacultural heritage ng probinsya sa amin. Ako po ay pangatlo sa pitong (7) magkakapatid at ang magulang ko po ay parehong magsasaka. Nandito po ako upang isalaysay, bilang isang kabataan, ang mga nagbago sa aming kultura.

(Good morning everyone. I am Dalia Naliw, twenty-four (24) years old, and presently working at our provincial cultural heritage office. I am the third child of the seven (7) children of parents who are both farmers. I am here as a representative of the youth to testify to the change in our culture.)

Una po noong maranasan namin ang epekto ng El Niño way back 2004, I think, kung saan dumadayo po kami sa kabilang sitio para mag-igib ng tubig dahil iyong reservoir po sa amin ay tuyo na. Doon po kasi sa kabilang sitio, may creek po doon na hindi po natutuyo.

(First, when we felt the effects of El Niño wayback in 2004, we went to the other barangay just to fetch water because our reservoir dried-up. In that barangay, there was a creek that did not dry.)

Pangalawa po sa aming kabuhayan, pagsasaka po kasi ang pangunahing ikinabubuhay namin. Kung kaya't sa kakulangan ng tubig naapektuhan po ang aming ani. Kumpara po sa ngayon na lagi na pong umuulan. At dahil po sa sobrang ulan, napa-flood po ang aming palayan na minsan nag-cause po ng landslide sa amin.

(Second, in our livelihood. Farming is our main source of livelihood. That is why, the insufficiency of water affected our harvest. To compare it these days, it is always raining. Heavy rain causes flooding and landslides in our rice fields.)

Dahil po sa ganitong sitwasyon, kung saan hindi po kumakasya sa pang-araw-araw naming ikinabubuhay lalo na nga po at nag-aaral po kaming magkakapatid kaya't nagdesisyon po ang aking ama na magtrabaho po sa Baguio. Kahit po ayaw niya ay kailangan po niyang gawin iyon upang masuportahan kami at mapag-aral. Iyong nanay ko naman po umi-ekstra po

siya sa pagtatrabaho sa gilid ng kalsada. Nag-aplay po siya sa DPWH, iyong contractual lang po. Tapos iyon po, kapag bumabagyo po sa amin, sobra po iyon, ay hindi po uso ang evacuation center dahil iyong mga tao po doon sa amin halos magkakakilala tapos nagtutulungan po sila. Kaya't kung ang bahay ninyo ay medyo delikado kapag bumabagyo ay puwede kang i-accommodate ng kapit-bahay mo nang wala pong bayad.

(Given this situation, there was not enough to sustain our necessities especially that we are all studying. This was the reason why my father decided to work in Baguio. Even though he did not like it, he had to do it in order to support us and send us to school. My mother did extra work on the road side. She applied for contractual work in DPWH. During big typhoons, evacuation centers are uncommon because the people knew and helped each other. If you were in danger, you would be accommodated by your neighbor without any payment.)

Tapos kapag bumabagyo, noong time po na karaniwang bumabagyo sa amin, nag-aaral pa po ako noon sa Baguio. Kaya't sobrang pag-alala ko po, lalo na po sa amin na prone po siya sa landslide. Ang tatay ko po kasi noon ay isang minero. Iyon po.

(Everytime there were typhoons, which came regularly, I was very worried because our place was prone to landslide, and especially my father was a miner. During those times I was studying in Baguio. That's it.)

Sa amin naman pong kapaligiran, kung noon po ay may nakukuha po kaming mga bungang-kahoy, mga halamang-gamot, at mga gulay na nauulam na kusang tumutubo sa paligid, ngayon po ay unti-unti na po itong nawawala dahil po siguro sa klase ng klima ngayon na pabago-bago, at iyong paggamit po ng insecticide/pesticide at herbicide sa pagpatay ng damo.

(Within our surroundings, we could get fruits, herbal medicines, and vegetables that sprouted in our yard before. We used them and cooked them for our viand. This time, these are slowly diminishing. It may be because of the climate which is constantly changing, and the use of insecticide/pesticide and herbicide to kill the weeds.)

Panghuli po, sa aming kultura, gaya po ng nabanggit ni Lolo Buucan, iyong ritwal namin na tinatawag naBaki – iyong mga nagpe-perform po ng Baki ay tinatawag naming Mumbaki – isa po itong rice ritual, na ginagawa po bago magtanim at pagkatapos ng ani para hindi po kakainin ng peste o mga daga ang iyong mga palay.

(Lastly, in our culture, like what Grandfather Buucan has said, we had our ritual called "*baki*" – we call the ones who perform the *Baki* as the *Mumbaki*.

This is a rice ritual that was done before planting and after harvesting so that pests or rats will not eat the rice grains.)

Sa ngayon po hindi na siya masyadong napa-practice dahil sa lumaganap na po iyong Christianity. Nakikita ko din pong isang contributing factor is iyong mainit na panahon ngayon. Kapag ginagawa po kasi ang Baki, may kaugalian na dapat hindi ka maligo ng isang buwan. Pero siyempre sa ngayon, kasi mainit na po iyong weather, minsan hindi nila kinakaya. Iyon po.

(As of now, the *Baki* is seldom practiced because of the influence of Christianity. What I also see as a contributing factor is the hot weather now. The *Baki* tradition is observed by not taking a bath for a month. Of course, nowadays, you cannot do it because the weather is hot. The scorching heat is unbearable. That's it.)

Karamihan po ng mga ka-edad ko ay gusto nang manirahan sa siyudad dahil hindi daw po boring ganoon. Sa kagustuhan ko pong malaman ang aming tradisyon at kultura, minahal ko po ang aking trabaho kung saan kami po ay nagka-conduct po ng mga programs or training. Isa po dito ang stone walling na ang beneficiary po rito ay ang mga kabataan. Tinuturuan po namin sila kung paano mag-riprap lalo na po sa mga rice terraces na kabilang sa Cultural World Heritage para magawa po ito ulit.

(Then, most of my fellow youth in our place would like to live in the city because it is not boring there. My desire to know our tradition and culture was the reason I value my work even more. I conduct programs or training. One of these is stone walling wherein the beneficiaries are the youth. We teach them how to riprap the rice terraces that is included in Cultural World Heritage so that it can be restored.)

Isa rin po ay iyong training sa handicraft, at iyong pag-aaral namin ng native dance andsong. Mayroon din po kaming researchna tinatawag naming Flora and Fauna kung saan mino-monitor po namin every three (3) years iyong mga useful plants and animals na nakikita sa mga palayan kung nag-e-exist pa po ba ang mga ito at kung bakit po nadi-diminish na. Iyon lang po.

(Another is the training for handicraft making and learning our native dances and songs. We also conduct research called "Flora and Fauna" every three (3) years. We monitor the useful plants and animals that we see in the rice fields, whether they still exist or the reason why they are diminishing. That's it.)

ATTY. MAYO-ANDA:

Salamat Dalia, *Ginoong* William Mamanglo. (Thank you, Dalia, Mr. William Mamanglo.)

MR. MAMANGLO:

Magandang umaga po sa ating lahat, lalong-lalo na sa Chairperson *at mga* Commissioners *ng* Commission on Human Rights.

(Good morning to all of us especially to the Chairperson and the Commissioners of the Commission on Human Rights.)

I am not an avid fan of the President Rodrigo Roa Duterte, but sometimes, I admire him. One of the things that I admire from him is when he closed Boracay purposely for rehabilitation so as not to worsen the problem there. On his SONA, I heard him and he made a very strong critique to the Commission on Human Rights by saying, "Your concern is human rights, mine is human lives." But today I see that the Commission on Human Rights took cognizance of this petition.

It changed my mind*, na sabi ko sa sarili ko, "May ginagawa naman pala ang* Commision on Human Rights*." So nararamdaman ko na ganito ka pala kaimportante sa* Commision on Human Rights*. Dapat ganito ang sinabi ni*President Duterte*, "Your concern is saving lives, mine is taking lives." Iyong last po na portion, paki-*delete *lang po iyon, baka aabot kay* Presidente *Duterte eh pupuntahan kami sa aming lugar sa Ifugao. So maraming salamat po. Kumukuha lang po ako ng buwelo. Medyo ninenerbyos, pakibalik lang po sa ano...*

(It changed my mind, and I told myself, "The Commission on Human Rights is doing something." Now I feel how important the Commission on Human Rights is. President Duterte should have said, "Your concern is saving lives, mine is taking lives." The last portion, please delete it because it may reach President Duterte, and he might look for us in our place in Ifugao. So thank you very much. I'm quite nervous, please return to the.)

Again, I am William, and I am here to present the case of our rice terraces particularly on the effect of the climate change. Next slide please.

Our Province of Ifugao is located in the Cordillera Region in Northern Luzon. I would like to inform everybody that Ifugao is not a part of Baguio, as a misconception of many. If you travel from Banaue or from Ifugao to Baguio, it will take you eight (8) hours by bus and six (6) hours by van. *So malayo po ang agwat namin doon. So hindi po kami part ng Baguio.* (So we are far from there. We are not a part of Baguio) although we belong to one (1) region we call the Cordillera Administrative Region.

Before we became a full-fledged province in 1966, we were part of the old Mountain Province. But when President Cory Aquino became president, as a gift to the Igorot people, she issued Executive Order No. 220 in 1987, creating

the Cordillera Administrative Region. And *noong nabuo iyon* (and when it was formed), we became a part of that region.

We have eleven (11) municipalities composed of one hundred seventy-five (175) barangays, and we are a third-class province with a total population, as of 2015, of more than two hundred two thousand (202,000) people.

Our land, ninety percent (90%) of it, is forest land. Only ten percent (10%) is alienable and disposable, meaning *ito iyong ginagamit namin* (this is what we use) for our houses and for some other commercial or business purposes. *Kasi* mostly we are (Mostly our place is) forest land.

In 1995, the UNESCO declared our rice terraces, actually two (2) in Banaue, with the inscription of a living cultural landscape.

But unfortunately, in 2001, upon its inscription as a World Heritage Site, on that day, we were included on the list of the one hundred (100) Most Endangered Sites in the World Monument Watch, and UNESCO warned us that we should do something, otherwise we will be removed from the list. So our government, our national government, and all the stakeholders have done something, and in 2012, we were removed but again returned as a World Heritage Site.

As a cultural heritage site, we practice important cultural activities like the *Punnuk,* which was declared as a representative list of the intangible culture heritage of humanity in the UNESCO. It is an important part of our ritual, a post-harvest ritual. That in the last *Punnuk* of this year, our new Tourism Secretary Bernadette Romulo-Puyat attended that event. And we are also a Geographically Important Agricultural Heritage (GIAH) system, according to the Food and Agriculture Organization. The only GIAH site in the country.

We are divided according to four (4) major tribes: Ayangan, Tuwali, Kalanguya, and the Kalinga. I am a Tuwali, he is also a Tuwali, and some part Ayangan. So they belong to two (2) tribes, while I belong only to one tribe.
On our economy, our main source of livelihood is actually agriculture, working on our fields in the rice terraces. *Secondary na lang iyong mga* piggery and then *iyong mga* other livestock livelihood. (Piggery and livestock livelihood are just secondary.)

In terms of tourism, we have a lot to offer in the Province of Ifugao. *But the most visited* is our rice terraces. Secondary *na yang mga* others. (But the most frequently visited tourist attraction in Ifugao is our rice terraces. The others are all secondary.)

On major investment, we invest on eco-cultural and agricultural tourism. Unfortunately, *iyong* rice terraces *po namin* (these rice terraces of ours), while

they exist and while they are wonderful, we are experiencing so much problem in maintaining and in keeping up our rice terraces. Our number one problem is actually on disturbed ecosystem. So *ngayon nasisira na po yung* ecosystem *ng aming lugar, sa aming mga* rice terraces. (As of now, the ecosystem is being destroyed in our place, in our rice terraces.) As our people in Ifugao assimilate modern ways of life, they improve their life, they earn money, *ito na rin iyong nagbibigay ng* development, *na* unregulated *na mga development* (but this is unregulated development.)

We have laws and ordinances on land or zoning ordinances but, unfortunately, there is no political will in our province and in our municipality to implement these things. They just allow people to just build their houses wherever they want.

While it is declared as a World Heritage Site*, lagi na lang ganoon na* they just build where they intend to build. *Basta sasabihin lang, "Sa amin iyong lupa."* So that's why *na-di-*disturb *iyong* ecosystem *namin* because *kahit saan na nilalagay, so nagda-*divert-divert *ang mga* canal*. Hindi na*natural *iyong* flow *ng tubig sa ibang* canals *namin, marami na ring nasisira sa ating kalikasan.*

(While it is declared as a World Heritage Site, it has always been like that – people just build where they want to build. They would just claim they own the land. So that's why our ecosystem is disturbed because they build anywhere, and the canals are diverted. The flow of water is not natural anymore in our other canals.)

Number two is the unregulated use of insecticides and pesticides nowadays, which lead to the extinction of flora and fauna and the dwindling biodiversity of our rice terraces. In the past, we were organic in every planting we do. But, unfortunately, today, we adapt some sort of fertilizing. *Ito na iyong mga* inorganic *na pag-*fertilize *sa aming mga tinatanim.*

(This is the use of inorganic fertilizers in the crops we plant), which unfortunately destroys the biodiversity and kills the flora and fauna sometimes living in our rice terraces.)

And the use also of machinery have a very great impact on our biodiversity. Like, for example, a tractor. *Noon* (Then),we relied on human power and carabaos. *Ngayon tractor na.* (Now, it's the tractor).

Imadyinin mo iyong makina gumaganuon-ganoon, hinahalu-halungkat iyong palayan namin. Of course, every living creature on that part *ay namamatay. Tulad ng mga* eels *namin na pinagkukuhanan namin ng mga ulam. Tulad ng mga gabi na nakatanim doon. Snails na puwede naming kainin.* It is killed by these machines. Up to today*na nagiging* extinct *na.* In fact, eight (8) years ago, I was still taking them.

(So you can just imagine how the machines work and rummage our rice fields. Of course, every living creature on that part will die. Like the eels that we eat. Like the taro roots that we have planted. Snails that we can also eat. They are killed by these machines. Up to today, they are getting extinct. In fact, eight (8) years ago, those were the ones we have. I was taking them.)

Ngayon (Now), I cannot even find one unless I will go and hike two (2) to three (3) hours from our place. So i*yan po iyong epekto ng* (that is the effect of) unregulated use of insecticides and pesticides, and other agricultural machinery.

Isa is *iyong tinatawag nating* population growth. *Dumarami na rin ang tao sa Ifugao. Kaya* people rely on the ecology as the source of raw materials. Everytime*doon na lang nagdidepende ang mga tao sa aming kapaligiran.* Everything they want*na puwedeng makuha sa* nature, theytake it because of population growth. And one more thing*na nakikita kong epekto* ng population growth *sa amin is lahat na ng mga tao doon nagtayo ng bahay, bumili ng mga sasakyan,* and of course, we become an overcrowded place.

(One thing that also disturbs our ecosystem is what we call population growth. The number of people is increasing in Ifugao. That is why people depend on the ecology as the source of raw materials. People depend on the environment. Everything they want, sourced from nature, is taken because of population growth. And one more thing that I saw as an effect of population growth in our place is all the people who built their houses also bought vehicles. And, of course, we become an overcrowded place.)

Kasama na rito iyong pinaka-ayaw ko – car companies giving cars like candies. You just give them fifty thousand (50,000) pesos and you can take cars. This should have been regulated in the first place *para hindi ganoon na lang na kinukuha ng mga tao ang* mga cars*tapos inuuwi sa amin, tapos doon na kami nagkukulang ng* parking to the point na *ang* government *na namin and nagpapagawa ng mga* parking spaces *doon.* In the future, *magiging problema din namin* because of the carbon emission build-up in our place. That's why *kung pwede ring pakitingnan* if we can regulate car purchases, particularly *na hindi dapat magbibigay ka lang ng kahit wala* or twenty thousand(20,000) pesos ay *makakakuha ka na ng sasakyan.*

(Included here is the one I really hate –car companies giving cars like candies. You just give them fifty thousand (50,000) pesos and you can take cars. This should have been regulated in the first place. People get cars and bring it to our place. There, we lack parking lots to the point that our government will have to make and provide parking spaces. In the future, it will also become our problem because of the carbon emission build-up and pollution. That is why we should also look at this, if we can regulate car purchases. Even

without a downpayment, or with just twenty thousand (20,000) pesos, you can get a vehicle.)

And, of course, watershed degradation and unregulated cutting of trees. I have said earlier, we rely on our environment and our ecology for all the materials needed by our community *at ng* population *namin* (and our population*).* Can you imagine if we build a building, like I say, for example, like this, we took*, iyong mga* woods *namin,* we cut them, we cut three hundred (300) to five hundred (500) logs in order to build. *Kasi iyon iyong ginagamit naming pang-porma. So nag-iiba na rin iyong ano namin sa* ecology *namin kasi putol kami nang putol ng kahoy.* Of course, with all the imbalance in our ecology today, *marami na kaming problema.* (Can you imagine if we build a building, for example, we took our woods, we cut them, we cut three hundred (300) to five hundred (500) logs to build. That's what we will use as scaffoldings and frames for the house. So our attitude on ecology became different because we keep on cutting trees. Of course, with all the imbalance in our ecology today, we have more problems.) Not really on our rice terraces but on our life as a people of Ifugao. Today, we experience *iyong tinatawag nating* (what we call) climate change.

In our place, when I ask these people*, "Alam ninyo ba ang* climate change?*" Wala silang masabi.* (In our place, when I ask people if they know what climate change is, they cannot really tell what climate change is.) They will just tell stories and we would understand that as a climate change. Like in coming to Manila, when we enter the bus, we already experience climate change. *Kasi* we are breathing air *na parang hindi sa amin.* (We we are breathing air not meant for us.)

When I enter this room yesterday, I have colds because I am not used to that, although it is cold in our place. *Ganito ang lamig sa amin, pero hindi ganito ang amoy ng aming hangin.* (This is as cold as in our place but the air does not smell like this.) So this is how I define climate change. They could not tell that this is really climate change.

*In our place, tungkol sa*climate change, *maraming pagbabago tulad ng sinabi ng* culture bearer *namin dito. Noon is matatantiya mo kung kailan uulan. Ang ulan namin sa Ifugao actually noon* is June or July. July*, ulan na iyan.* And then, of course*, pagdating dapat ng* November, *wala nang ulan kasi iyan ang taniman ng tao. Magtatanim sila.* And then March and August, *iyan ang* summer *namin. Ang problema ngayon,* there is no way to calculate anymore*kung kailan talaga magiging maulan. Mas marami nang maulan ngayon.*

(So in our place, climate change has brought so many changes like what our culture bearer has said. Before, you can determine when it would rain. The rainy season in Ifugao occurs during June or July. If it's July, it rains. By

November, it should not be raining because that is the season when people have to plant. The problem now is that there is no way to predict anymore when it is really rainy.)

Until now, it is raining in our place in Banaue which we cannot explain. And this is displacing our farmers. You know why? Because the harvest is supposedly July, *tapos na ang* harvest *sa aming palay. Dapat ito ay isasampay na at matutuyo at ibabayo at kakainin. But dahil sa ulan nang ulan,* there is no chance to dry them.

(Because the harvest is supposedly July, the harvest of our rice grains is done. Those should be hung to dry, pounded and eaten. But because it is always raining, there is no chance to dry them.)

So what happened to our *palay* (rice grains)? They will always be in a moist condition. *Lagi na lang basa,* to the point *na mamumunga na iyong iba.* (They are wet while the others are ready for harvest) which lead to low production. And, of course, our farmers will be dismayed and comes the next harvest, the tendency is "*hayaan mo na* (just let it be)*,* I will just go to other places, and I will just work and buy rice." And that will eventually be the start of the abandonment of our rice terraces. *Iyan iyong mga epekto ng mga* climate change*sa amin. Pagbabago sa panahon.* (Those are the effects of climate change for us. Changes in weather pattern.)

Isa pa, tulad ng sinabi niya, talagang noon, kahit magbilad ka sa araw, eighto'clock *lalabas ka, magbilad ka sa araw maganda, kasi* we were taught that it will give us vitamins. Today, it might give us not vitamins because eight o'clock *pa lang talagang masakit na masakit na sa katawan.*

(One thing, like what she said, even if you stay under the sun by eight o'clock before, the heat of the sun is still good because we were taught that it will give us vitamins. Today, it might give us not vitamins because eight o'clock these days is really painful to the body.)

One more thing, as explained by Dalia here, we had two (2) years in our place *na dry na rin,* and they just call it El Niño. With that*, iyong mga* irrigation system *namin, iyong mga* water supply *namin,* cannot anymore supply *iyong mga palayan namin* which will eventually lead to it becoming idle *na nagiging* very dry *na, nagka-crack na iyong aming palayan.* And at times*na biglang umulan, papasok iyong mga tubig sa loob ng mga bitak* and that will eventually lead to the erosion of our rice terraces.

(One more thing, as explained by Dalia, we had two (2) years of drought in our place, El Niño. With that, our irrigation system, our water supply, cannot supply our rice fields anymore. This dried or cracked our rice fields. At times,

when it rains suddenly, the water get into the cracks and that will eventually lead to the erosion of our rice terraces.)

And mind you, ladies and gentlemen, our rice terraces are not in the lowland, they are in the mountain. *Mataas iyan*, so the tendency is *babagsak sa baba. Iyong mga nabagsak sa baba, hindi lang iyon ang problema kasi pati iyong binagsakan*. (That is in high slope. In effect, the eroded soil will fall. It also becomes a problem of the place where the eroded soil ends up.)

And who are we as humans, *na hindi naman talaga madaling ibalik kapag nasira na ang isang* (it is not easy to restore) rice terraces because it is very costly and you cannot even compensate what you get from these rice terraces? So that's it. *Yun ang* climate change*sa atin*. That's climate change for us.

So there rice terraces farmers in our place have inadequate income. Unfortunately, the very people who gives tourism to our place is the one who suffer. *Paano* (Because), number one, undeveloped rice terraces products. So systematic*na ito dapat ang gagawin ninyo para ma-preserve ninyo ang inyong mga produkto.* We lack the technical knowledge and some other knowledge as to develop our rice terraces products as compared*sa mga ibang* commercial products *na binebenta sa* marketplace.

(There is a systematic manner to preserve products. We should observe this but we lack the technical knowledge and expertise to develop our rice terraces products as compared with other commercial products in the marketplace.)

If you go there, *imbes na* organic *ang kukunin mo, butas-butas kasi inano ng mga peste.* And, of course, for the buyers, the tendency is*, "Kukunin ko na lang ito kasi mas maganda,"* which are not actually organic. (If you go to the markets, people don't patronize organic produce that had been infested with pest. Of course, the tendency of a buyer is to just get the ones that are more visually appealing even though these are not organic.) So what I mean is there should be a way to make organic look also nice. *Iyan iyong problema namin sa* (This is the problem with) undeveloped rice terraces products.

High cost of maintaining the rice terraces is attributed to the diminishing practice of the *batyang* which we call *bayanihan.Noon,* we live as people, we work as a people. In our rice terraces, when we do harvest, we do it as a community. Like, for example, if he has a farm, during his harvest or his planting season, I will go and help him. At times also he needs my help, we do it that way. If we destroy our irrigation because of some calamities, we go as a community and repair it. Unfortunately, that spirit is not living anymore in the Ifugao today.

Instead, we hire laborers to maintain our rice terraces which at times our people would find it too costly. *Kasi noon, kapag nagtutulungan, walang*

bayad. Ngayon, wala nang tulungan, we hire laborers to do our work in the rice terraces. *Ang nangyayari* is it will give us, rice terraces owners, additional burden of paying laborers. *Tapos ang makukuha mo lang sa* rice terraces *mo na napakaliit, is hindi pa kasya sa ibinigay mo sa mga laborers.* So the tendency is with those causes*na nagiging* very costly *na talaga ang paggawa sa palayan, ano ang ginagawa ng aming mga kabataan o iyong mga ibang tao na* able *sa mga* rice terraces?

(When we helped each other before, it was free of charge. Now, there is no more help. We hire laborers to work in the rice terraces. Rice terraces owners now have an additional burden – to pay laborers. The small income you get from the rice terraces is not even enough for the laborers. So with these farming the rice fields has become very costly. What do our youths or other able-bodied people do?)

They go to other places looking for greener pasture. They come to Baguio to work as miners. They go to other places, abroad, or here in Manila. There is also low production of farmers working their rice terraces. Number one is *iyong mga peste. Ngayon, talagang marami na ring mga pesteng dumating.* I do not know *iyong mga iba,* unfortunately, *ang sinasabi ng mga tao,* it is being introduced by the Department of Agriculture. Because there is no good study, or no, *walang* study *tapos biglang mag-i-*introduce *ang mga taga* Department of Agriculture. Like, for example, they just come to our place, *"Ito ang magandang itanim mo." Tinanim, maganda sa una, pero at times sinisira na naman iyong aming natural na kalikasan o iyong dati naming tinatanim or nagiging peste na sa amin.* Like, for example, there is a part there*na nagiging dry na o nagiging patay na iyong palay* because of pests.

(Number one is the pests. Now there are so many pests that thrive. I do not know the others. Unfortunately, the people say they have been introduced by the Department of Agriculture. There are no good studies or there is really no study yet and the Department of Agriculture will suddenly introduce, like for example, they just come to our place saying, "This is a good plant to produce." Eventually, it was planted. At first, it was good but sometimes, the harvest is destroying our nature or the ones that we previously planted, or it becomes pests to us. For example, what you see in this part of rice terraces became dry, or the rice grains die because of pests.)

The other one which lead to low production is natural calamity. We are prone to calamity. *Sa amin ay hindi naman kami napa-*flood. *Walang problema sa mga* evacuation. *Walang problema minsan lang in* rare cases, *natatabunan iyong mga tao namin. Iyan iyong mga problema. Walang baha sa amin. Pero* when these calamities hit us, *ang hini-*hit is our source of our livelihood, andthe source of our income. *Na parang nag-*suffer *na kami.* And low soil fertility, inadequate irrigation supply. What is happening today? *Iyong mga tubig namin, may hose na ngayon. Hino-hose na lang ngayon at dinidirekta*

sa kanilang bahay. So iisa na lang o nabibilang na lang ang parang nakikinabang sa mga tubig namin. Hindi tulad noon na talagang irigasyon.

(In our place, we do not get flooded so there is no problem with evacuation. Despite this, some people have been buried alive. There is no flood in our place but these calamities that hit us, they affect our sources of livelihood and income. We have suffered because of low soil fertility, inadequate irrigation supply. What is happening today? Water is now hosed directly to people's houses. Unlike before, when water was supplied just through irrigation.)

Next, low farm gate of products. *Hindi talaga... iyong products namin binibili ng mura.* (Our products are really being bought cheap.)

So with those problems, we convert our rice terraces to other uses.

It is difficult to sustain the volume supply of valued products from the rice terraces because of deviation from the agricultural system, and there is no benefit from tourism-related businesses. *Alam ninyo, ang kawawa talaga sa* (You know, all of you, the ones who really suffer in) Ifugao, while we are World Heritage Site visited almost every year by many tourists, unfortunately, not a penny goes to our farmers who maintain those rice terraces. Next please.

So we have a deterioration of the cultural terraces' cultural foundation. *Iyong mga* (These) cultural values *namin* which have sustained our rice terraces for centuries are now deteriorating because of the... what do you call this? *Walang gana ang aming mga kabataan* (Our youth are not interested) to continue this because they think that these are now obsolete, *iyong mga* (our) cultural values *namin*. That is because of religion, of Christianity, and formal education.

As mentioned earlier, the non-observance of customary rituals is also a contributing factor in the deterioration of the rice terraces cultural foundation. Inadequate support to rice terraces farmers, like, for example, "Rice Planting Synchronization Ordinance." *Iyong pag*-plant *dapat sa mga buwan na ito, hindi na nasusunod kahit may mga batas*. (The schedule of planting in certain months is not followed even if there are laws.)

So that's it. Thank you.

ATTY. MAYO-ANDA:

Maraming Salamat, (Thank you very much.) *Ginoong* (Mr.) William Mamanglo. Your Honors, please may we request to question them?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

Thank you.

Para po sa inyong, lahat. Salamat po, Ginoong Buucan*, kay Dalia, at kay Ginoong William. Ang tanong ko lang po tungkol sa kahalagaan ng baki, kasi binanggit po ninyo na mahalaga ito na bahagi ng inyong kultura at sa pagbibigay ng sagana sa inyong pagtatanim at pagsasaka. Puwede po bang maipaliwanag pa po ninyo nang maayos?*

(To all of you. Thank you, Mr. Buucan, to Dalia, and to Mr. William. My question is about the importance of *Baki.* You have mentioned it as an important part of your culture and the way it gives abundance to your harvest and farming. Can you explain it more clearly, please?)

MR. MAMANGLO:

Ang importansiya ng baki sa aming mga Ifugao is ito noon kapag nagba-baki kami, talagang malakas iyong baki sa aming mga palayan kasi hindi ito inaatake ng mga peste tulad ng mga daga at nami-maintain iyong rice fields namin dahil sa mga baki na ito. Kasi noon talaga, sinusunod iyong mga alituntunin sa baki. Like, for example, iyong mga taboo na kung nag-baki ka, dapat hindi mo ito gawin. Eh, ngayon, kapag nag-baki na ang isang Mumbaki, kahit sabihin mong taboo na kakain ka ng mga isda, o mga ganitong pagkain ay ginagawa pa rin nila kaya ngayon, wala nang epekto iyong baki.

(The importance of baki for us in Ifugao is when we did *Baki* before, the effect of *Baki* was really strong because our rice fields were not attacked by pests like rats. Our rice fields were being maintained because of this. The *Baki*regulations were really followed before. For example, there were taboos and limitations when doing the *Baki*. Now, when a *Mumbaki* did the *Baki* even if you will say it is taboo to eat fish or food, they still do it. This is the reason why the *Baki* is no longer effective.)

ATTY. MAYO-ANDA:

Puwede din po kayong sumagot, Ginoong William at si Dalia. Ang pangalawa kong tanong, papaano po naapektuhan yung baki? Binanggit kasi ni Dalia

kanina na iyong matinding init ay may epekto doon sa pagbabaki. Mayroon pa bang ibang dahilan na may kaugnayan sa pagbabago ng panahon?

(You can also answer, Mr. William and you Dalia. My second question is how the *Baki* is impacted? Dalia mentioned that the extreme heat has also an effect in the process of Baki. Are there other reasons related to the changes in weather?)

MR. MAMANGLO:

(Translating Mr. Buucan Hangdaan's reply in Ifugao.) Isa rin pong problema sa baki na ito ay iyong problema sa Christian community. Kino-condemn nila ang Baki as a pagan act. So ngayon, hindi na ginagawa ang pag-baki dahil sa mga pagpatuloy na pagsasabi ng mga Kristiyano na ito ay hindi tama. Ito ay isang pagan act. At isa pa ay very costly talaga ang pag-baki. Kasi kung sinabi ng Mumbaki na ang kailangan nating i-sacrifice to the Gods of the Rice and to the Gods of Life is baboy ay kailangan maglalabas ka ng baboy. Pero mostly naman, chicken din iyong pinapakuha. Pero kapag native chicken, sa amin medyo mahal din. Kaya ngayon, ito iyong mga iba, sabi niya, sabi nila, mahal ang pag-perform ng isang Baki.

(The *Baki* is problematic within the Christian community. Christians condemn it as a pagan act. So now, the *Baki* is not done anymore because the Christians are continuously saying that it's not correct because this is a pagan act. Furthermore, *Baki* is really expensive to undertake. When the Mumbaki says that you must sacrifice to the gods of the rice and to the gods of life, you need to take a pig. But most of the time, it is chicken that they are offering. But if it is native chicken, it is still costly. That's why for now it is expensive to perform the *Baki.*)

ATTY. MAYO-ANDA:

Salamat, Ginoong Buucan.May idadagdag ba? (Thank you, Mr. Buucan. Would you add more?)

MR. MAMANGLO:

*(Translating Mr. Hangdaan's reply in Ifugao.) Ayon sa Mumbaki, kapag nag-*perform *ng Baki, may* restrictions. Like, for example, *may time,* let us say, *pagkatapos ng harvest, ang mga nag-baki* should stay in their homes, *walang lalabas o pupunta sa fields. Pero ngayon,* with the advent of Christianity, *sinasabi nilang "Ay, hindi na puwede iyan kasi Kristiyano kami. Susuwayin iyong mga utos ngMumbaki* so *parang wala nang epekto yung mga ito.*

(The *Mumbaki* have some restrictions when they perform *Baki*. For example, there are times after the harvest when people should stay in their homes. Nobody should go out or go to the fields. But with the advent of Christianity, they will say, "Ah, it cannot be because we are already Christians. They will violate the rules of the *Mumbaki* as if it has no more effect on them.)

ATTY. MAYO-ANDA:

Salamat, ang last na tanong ko lang kay Ginoong William, dahil nasa Ifugao Cultural Heritage Office *po kayo, iyong binanggit ninyo po kaninang epekto ng pagbabago ng klima, ito po ba ay nadudokumento po ng pamahalaan o ng ibang institusyon? Kung may nalalaman po ba kayong inisyatibo na nagdudokumento ng ganitong mga pagbabago at mga karanasan?*

(Thank you, my last question is for Mr. William. Because you are in the Ifugao Cultural Heritage Office. You mentioned about the effect of climate change. Are these documented by the government or other institutions? Do you know of any initiatives that document these changes and experiences?)

MR. MAMANGLO:

I have not come to any knowledge*na may ganoong ginagawa ang Probinsiya namin* or any agencies of the government or non-governmental organization *sa aming lugar. Ang ginagawa po namin is hindi namin inaano kung iyon ba ay dahil sa klima, pagbabago sa klima.* We only inventoried *iyong nandoon pa sa aming palayan. Kung nag-i-*exist *ba iyong mga ito na kinakain namin noon at kung mayroon pa.*

(I have not come to any knowledge of my Provincial Government or any agency of government or any non-governmental organization doing documentation in our place. What we are doing are not in context of the weather or changes of weather. We merely do an inventory of the produce of our rice fields, what were produced before and if there are still some for future use.)

ATTY. MAYO-ANDA:

Maraming salamat po. (Thank you very much.) That will be all, Your Honor.

PANEL CHAIR CADIZ:

Thank you very much. The Panel will now be fielding questions.

Commissioner Leah Armamento?

COMM. TANODRA-ARMAMENTO:

Magandang umaga po sa inyo. Magtatanong po ako kay Ginoong Buucan. Ano po sa tingin ninyo, kasi may sinasabi kayo na nagbago ang panahon dahil umiiksi iyong pagsasaka ninyo dahil sa sobrang init ng panahon. Gusto kong malaman kung ano ang nangyari sa inyong lugar na masasabi ninyo na naging dahilan ng pagbabago ng panahon. At kung nagbago ang panahon, at naapektuhan ang inyong pamumuhay, may ginawa ba kayong paraan para naman umayos ang buhay ninyo kahit nagbago ang panahon?

(Good morning everyone. I would like to ask Mr. Buucan. In your point of view, because you were saying that weather has changed, and you said your time in farming has been shortened because of the extreme heat, I want to know if something happened in your place that resulted in a change in weather. And if the weather has changed and your livelihood was affected, have you done anything to make your life better even if the weather has changed?)

*Ang tanong ko naman kay Ginang Dalia Naliw, sa loob ng*twenty-four(24) years *na ikaw ay nabubuhay, kailan mo naranasan ang pagbabago ng panahon? Paano mo nasabi na nagbago na nga ang panahon? Mayroon bang nangyari sa inyong lugar na masabi mong naging dahilan ng pagbabago ng panahon sa inyong lugar?*

(My question also to Ms. Naliw, in your 24 years of existence, when did you experience the change in weather? How can you tell that the weather has really changed? Is there anything that happened in your place which you can say is the effect of change of weather?)

At kay Ginoong Mamanglo, nakita ko sa inyong (And to Mr. Mamanglo, I saw in your) presentation that the disturbance in your ecosystem is caused more by the actions, direct actions of the people and the government and the government rather by the climate change caused by the emission of gasoline.

MR. MAMANGLO:

(Translating Mr. Hangdaan's reply in Ifugao.) Ang matantiya ko lang is hindi ko namalayan. Maybe around ten (10) years ago *maganda pa rin, pero bigla*

ko na lang naramdaman na nagbago talaga ang init ng panahon sa pagta-trabaho namin sa palayan.

(I really did not notice. Maybe around ten (10) years ago, it was still good but suddenly I just felt the changes in hot weather when we were working in the rice fields.)

So sa pagbago ng panahon ay wala kaming magawa. Kailangan pa naming trabahuin iyong aming palayan. So what we did is to make some improvised hats – *gawa sa kawayan* – para i-shelter *namin iyong aming mga sarili sa araw.*

(We cannot do anything regarding the changes of climate. We need to work in our rice fields. So what we didis to make some improvised hats to shelter ourselves from the sun like the ones made out of bamboo.)

Iyon nalang daw kasi… (He said that will be all.)

MS. NALIW:

Sa akin naman po, noong naranasan ko po na epekto nang pagbabago ng klima is gaya ho nang nabanggit ko noong bata ako, naranasan ko po yung El Niño na talagang pumupunta po kami sa kabilang sitio para mag-igib po ng maiinom na tubig. Tapos iyong mga labahin naman po namin, pinupunta po namin siya sa ilog. May kalayuan po ang ilog sa amin pero tinitiis po namin. Tapos sa ngayon po kasi is iyong patuloy na pag-ulan, iyon po na hindi naman po gaya ng dati. Kung ngayon po kasi is lagi na lang po umuulan na hindi mo alam. Ganoon po.

(Like what I have said, I felt the effect of change of the climate when I experienced El Niño during my childhood. That was when we needed to go to the other barangay to fetch water for drinking. We had to bring our laundry to the river. The river is quite far from us but we endured that. Now, I have observed the continuous rain which is unusual. It continuously rains without any warning. Like that.)

COMM. TANODRA-ARMAMENTO:

My question to Mr.William Mamanglo is that I want you to confirm that the cause of climate change in your place based on your presentation is more on the direct action of man, like deforestation, illegal logging, rather than and the negligence on the part of the part of the government, rather than the climate change caused by the emission of gasoline.

MR. MAMANGLO:

Yes ma'am, I acknowledge that.

COMM. TANODRA-ARMAMENTO:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Dumpit, you might have questions to the witnesses?

COMM. GOMEZ-DUMPIT:

*Magandang umaga po. Itatanong ko lang po kay GinoongHangdaan, iyong paglipat ninyo or pag-angkat ninyo, or pag-akyat ninyo ng bagong palay, bakit po kayo nag-*introduce *ng bagong palay sa* farm *ninyo? Hindi ba sapat iyong traditional na palay na Tinawonsa inyo?*

(Good morning. I would like to ask Mr. Hangdaan about your importation of new rice grain, why did you change, why did you introduce the new rice grain in your farming? Is the traditional Tinawon rice grain not sufficient anymore?)

MR. MAMANGLO:

*(Translating Mr. Hangdaan's reply in Ifugao.) Bigla na lang ini-*introduce *sa amin. Sabi nila, maganda rin itong* variety *ng klase ng palay* so *puwede ninyong i-*try. *Noong sinubok nila ay okay iyong bunga, so tinuluy-tuloy iyong palay na*new variety. *Pero, noong ibalik iyong dating palay, medyo siya na iyong mahina. So tinuluy-tuloy na iyong* newly introducedvariety.

(It was suddenly introduced to us. They said it was a good variety of rice grain and we should try it. People liked the new variety of rice grain and continuously used it. But when the old rice grain was returned, the harvest was reduced. So the newly introduced variety continue to be planted.)

COMM. GOMEZ-DUMPIT:

May dahilan ba iyon na konektado sa klima o bumababa iyong production *talaga nung* Tinawon *kaya kayo nag-angkat ng ibang* variety? *Bumaba ba*

iyong production *noon kaya kayo nag*-experiment *ng iba?* (Are the reasons connected to the climate or to the lowering of production of Tinawon? Was the production lessened? Was this the reason why you have experimented on other varieties?)

MR. MAMANGLO:

(Translating Mr. Hangdaan's reply in Ifugao) Noong in-introduce *kasi sa amin ito…* I have to make you understand that *Tinawon* literally means once a year. *So iyong palay namin doon*is once a year. *Ang sinasabi ni Mr. Buucan ngayon is noong in*-introduce *ito, sinabi na ring* you can plant that twice a year. *So iyon iyong ginawa. Pero noong nakita nila na medyo maganda pa rin iyong Tinawon* rice*, noong ibalik na nila ay matumal na iyong paglaki sa pinagtamnan na ng mga* new variety. And Mr. Buucan observed that *ang* roots *o ang* stalks *ng* new variety *ay mahirap ma*-decay. *Eh ang* roots *ng aming Tinawon rice, kapag ilagay mo pa lang doon ay nadi*-decay *na so nagiging* fertilizer *agad. So iyong* new variety*, mahirap, para bang, mahirap ma*-decay.

(When this one was introduced to us, I have to make you understand that Tinawon literally means once a year. So our rice grains grow only once a year. What Mr. Buucan is saying now is that when this was introduced, they told us that the new variety of rice grain can be planted twice that year. So that was the thing they did. But the farmers noticed that the quality of Tinawon rice was still better. When they returned to plant it, they noticed that the growth of the Tinawon was slow in areas that were planted with the new variety before. And Mr. Buucan observed that the roots or the stalks of the new variety did not easily decay. When the roots of the Tinawon rice remained in the soil, it easily decayed. So the tendency was to use it as fertilizer. The new variety is sturdy because it does not rot easily.)

MR. MAMANGLO:

So *iyan iyong pagbabago. Kahit dalawang beses nilang tinatanim pero sinasabi niya maganda pa rin iyong Tinawon.Pero noong ibinalik ayaw na ngang tumubo doon. Dahil sa pagbabago ng lupa, pagbabago satexture na ng lupa.* (So that was the change. Even if they were planting twice, they still said that the Tinawon rice was better. When Tinawon was planted again, it did not grow anymore because of the change in the texture of the soil.)

COMM. GOMEZ-DUMPIT:

Maraming salamat. Iyong sa ritual, mabalik ako doon. Anyone of you can answer. Iyong sa baki, depende sa panahon din iyon eh, no? Tapos ang sinabi

ninyo na napaka-costly noon kung umiikli rin iyong panahon na in-between na mag-uumpisa kayo na magtanim kasi ginagawa ninyo bago magtanim, correct? So iyong panahon na paiba-iba, iyon na ang hindi ninyo masundan o you cannot cope with it because parang masyadong madalas na nangyayari. Kasi ngayon maiinit tapos bukas maulan, so hindi ninyo alam kung paano ipa-plot iyong time na magtatanim kayo. Sohindi ninyo rin ma-plotkung kalian kayo mag-ri-ritwal.Tama po ba iyong intindi ko roon sa inyong mga testimonya?

(Thank you. Let me go back to the ritual. Anyone of you can answer. Regarding *Baki*, it depends also on the weather, right? Then, you said that it was too costly considering the time between you start to plant was shortened because you perform that before you plant, correct? So the weather that is ever changing, that is the one you cannot follow or you can't cope with it because it's frequently happening because, now, it's hot, then tomorrow it's rainy. So you don't know how to plot when you'll plant. So you also cannot plot when you will do the ritual. Is my understanding based on your testimonials correct?)

MR. MAMANGLO:

Tama po iyong analysis *ninyo ma'am. Iyan iyong mga iba na mga dahilan – baka hindi na ma-*trace *kung kailan talaga gagawin iyon*. So *iyong iba, parang pinu-*forego *minsan yung pagba-baki.* (Your analysis is correct, Ma'am. Those are the other reasons – perhaps, it became difficult to trace when it should be done. So the others forego the *Baki*.)

MR. MAMANGLO:

But I would like to inform you that *ang baki, baki lang iyan ng palayan* have so many stages. *Kapag itanim mo pa lang ng palay, may baki na. Kapag magri-*rest *iyong mga tao, may baki na.* We call it, *upi*or *humakopkop. Magbabaki na kami ng ganoon. To thank the gods na nakapagtanim kami. And after harvest again, we perform again another baki, we call it umapoy. This is again to give back to the environment what they have given us. So marami. Malapit ka ring mag-*harvest, there is *baki na rin* for that.

(This to inform you that the *baki* I am talking about – for the rice fields alone – in fact, has so many stages. The moment you plant rice grains, there is *baki*. When the people rest, there is *baki.* We call it *upi* or *hu makopkop*. We do the *baki* then to thank the Gods that we have already planted. And after harvesting, we perform again another *baki*, we call it *umapoy*. This is again to give back to the environment what it has given us. So it's numerous. When harvest time is near, there is *baki* also for that.) So it is really very costly.

MR. MAMANGLO:

So aside doon sa sinabi ninyo ma'am na pabagu-bago na rin iyong pagtatanim ng mga tao, kasi noon, actually it was a community affair. Ngayon, hindi na sabay-sabay ang mga taong nagtatanim. Noon sabay-sabay silang nangungupi, kaya sabay rin silang nagbabaki, meaning, hindi masyadong malaki ang gastos kung tawagin mo iyong community mo para makisalo sa iyo kasi noon talagang silang lahat is doing that. Eh, ngayon kapag nag-perform ka na, baka hindi mo pa matutustusan iyong naibibigay mo sa community na pagkain, so iyong iba, parang they foregoit na rin kasi parang sinasabi sa sarili, "Ay hindi naman nangupi si..." Sumusunod na rin iyong iba. Hindi naman nagbaki si... let us say, for example, Mr. Buucan. O kunglate siyang nagtanim, eh, hindi na nya ipi-perform iyong baki minsan. Kasi late na rin, so hindi na rin nasunod iyong agricultural cycle namin.

(So aside from what you have said, Ma'am, the planting practices of the people are changing. *Baki* was a community affair before and farmers simultaneously planted. When they simultaneously did the *Baki,* you did not need to encourage the community to do the *Baki* since everybody was already doing that. But now, if you perform *Baki,* you might not even recover the expenses for the food given to the community. This is the reason why others tend to forego the system. If one cannot perform it, the others might follow him. Say, Mr. Buucan was delayed in planting, the tendency is he will not be performing *Baki* anymore because to his thinking he is already delayed. So our agricultural cycle was not followed.)

COMM. GOMEZ-DUMPIT:

Tapos na po? Itatanong ko lang, kailan ninyo natatandaan na may regular *kayo na* ritual based on *yung panahon na napi-*predict *natin kung kailan iyong tag-ulan, o magtatag-ulan na, at kailan iyong mag-tatag-araw na? Kailan iyong huling ganoon na natatandaan ninyo na* regular *iyong pag-ritual ninyo?* (Are you done? In your recollection, when did you last have a ritual, based on the time when you could still predict the rainy and dry seasons?)

MR. MAMANGLO:

(Translating Mr. Hangdaan's reply in Ifugao) Ang natatandaan ko lang, dapat November *na, nagtatanim na iyong mga tao para sabay-sabay kaming mag-baki. At sa*February or March*, dahil naka-*settle *na rin at nakatanim na parang* strong *na iyong palay namin, magbabaki kami ulit* to thank the God, *dapat rin sabay-sabay kami. Pero ngayon, dahil hindi na sinusunod iyong* November *na dapat iyan iyong* planting season*, parang wala na. Dahil hindi kami sabay-sabay na magba-baki, parang minsan pinu-*forego *na namin.*

(What I can remember is, by November, people had finished planting and would be performing and offering rituals together on February and March. Since November was not the only planting season now, no simultaneous *Baki* is happening. Sometimes we just forego the practice.)

COMM. GOMEZ-DUMPIT:

*May taon ba kayong natatandaan na*November *and then* February *iyong regular na schedule? Iyong huling taon?* (Can you remember a year where November and February are the regular schedule? The last year?)

MR. MAMANGLO:

(Translating Mr. Hangdaan's reply in Ifugao)According to Mr. Buucan, ang natatandaan niya is more than twenty (20) years ago. *Na iyong last na parang* communal *pa iyongbakina sa kanila. Iyon iyong natatandaan niya.* (What Mr. Buucan can remember is that the regular schedule was last followed more than twenty (20) years ago when the *Baki* was still communal. That is what he can remember.)

COMM. GOMEZ-DUMPIT:

Marami pong salamat. (Thank you very much.)

PANEL CHAIR CADIZ:

Thank you very much, Commissioner Dumpit.

Commisioner Pimentel-Gana?

COMM. PIMENTEL-GANA:

Magandang umaga po sa inyong lahat at sa ating mga resource persons. Ang tanong ko lang, kung sinuman ang sasagot sa inyo, ay katulad ng sinabi ni Comm. Karen, naapektuhan talaga ang inyong tradition at culture, no? Masasabi ninyo ba na sa pagbabago ng klima, iyon na ang naka-apekto talaga? Katulad ng sinabi ninyo sa pagba-baki? Ang nakita ko sa rason na ibinigay ni Ginoong Mamanglo was that hindi naman dahil sa klima, kung hindi dahil din siguro sa kulang ng pera kasi mahal. Hindi ba sabi mo, maraming beses iyon, tapos mahal. Mag-u-offer ka ng baboy, o baka, o even

manok, ano. So naapektuhan ang inyong culture and tradition.Ngayon, ito ba ay dahil din sa kaunti ang naaani ninyo? Dahil sa pagbabago ng klima, nagbago din ang inyong pag-aani or ang kinita ninyo, kaya naman naapektuhan din ang inyong tradisyon? Puwede mo bang sabihin iyon?

(Good morning to everybody and to our resource persons. My question is addressed to anyone who would like to answer, like what Comm. Karen has said, can you really say that your tradition and culture were really affected by the changing of climate? Like in the case of the *Baki,* given Mr. Mamanglo's reason of insufficient funds to mount the costly performance of *Baki.* You said it was done many times so it is costly. You will offer pig, or cow, or even chicken, right? So your culture and tradition are affected. Now, is it also because your harvest is less? Is it because of the change in climate, your reduced harvest and profits are the reasons why your tradition was also affected? Can you say that?)

MR. MAMANGLO:

*(Translating Mr. Hangdaan's reply in Ifugao) Wala raw alam si Mr. Buucan na*connection *sa* very low production *na dahil doon ay na-aano na rin iyong aming* ritual practices. *Hindi konektado.* (Mr. Buucan said there is no connection between the very low production and why our ritual practices are affected. It is not connected.)

COMM. PIMENTEL-GANA:

Sa pagbabago ng inyong pamumuhay or kaunting pag-ani? (In the change in your livelihood or insufficient harvest?)

MR. MAMANGLO:

Oo, wala. (Yes, there's none)

COMM. PIMENTEL-GANA:

So *ibig mong sabihin, talagang sa inyo na lang kusa iyong hindi paggawa n*gritual *ninyo?* (So you mean to say, it is really your own choice not to perform the ritual?)

MR. MAMANGLO:

Opo. (Yes.)

COMM. PIMENTEL-GANA:

Ah, okay. Ang gusto ko lang malaman, kasi nabasa ko lang sa testimonya ni lolo, na ang sabi niya is noong 2000 na daw, 1990s to 2000 nagbago na raw talaga ang klima at sabi niya ay napakasakit na sa balat ang init ngaraw. Napakainit daw, iba na ang timplado sa katawan, at hindi na ninyo kayang mag-ani ng tuluy-tuloy hanggang alas-singko.

(Ah, okay. What I want to know is that what I have read in the testimony of grandfather that the climate has already changed by year 2000, 1990s to 2000. He said that the heat of the sun was intense and painful to the skin. He said it was really hot. It affected the condition of the body and one could not harvest continuously until five o'clock.)

COMM. PIMENTEL-GANA:

Kasi sabi din ninyo, ang ritual ninyo noon is usually a community activity. Lahat sabay-sabay at magkakasama sa panahon ng pagtatanim at pag-ani, ganoon. Hindi ibig sabihin noon, pamilya-pamilya ang may-ari ng mga plots of land. Mayroon bang pagbabago sa dami ng mga nag-aani noon sa nag-aani ngayon? Ibig sabihin, may pagbabago ba? Mas kumonti ba ang mga farmers ngayon na may-ari ng lupa at ginive-up na nila ang land? Ano na ang nangyari sa mga plots of land na iyon?

(You also said that your ritual is usually a community activity. Everyone planted and harvested together and at about the same time. So it means to say that many families own plots of land. Is there any change in the number of farmers before compared to the farmers now? Are there less farmers now? Those who own their land and gave that up, what happened to those plots of land?)

MR. MAMANGLO:

(Translating Mr. Hangdaan's reply in Ifugao) Ma'am, ngayon po, dahil nakapag-aral na karamihan ang mga anak ng magsasaka, kumaunti na rin ang magsasaka sa amin ngayon. Kasi iyong mga nakapag-aral ngayon, sinasabi nila sa kanilang sarili, "Bakit pa ako magta-trabaho sa mga ganyan, eh mahirap magtrabaho diyan."

(Ma'am, for now, since most of the children of the farmers have been educated, we have lesser farmers. The ones who have studied tell themselves, 'why should I work in that place where work is so hard?') So they prefer to go to other places.

So ngayong iniwanan na nila, talagang naging abandoned land *na. Isa rin, sabi niya kanina, sa dahilan kung bakit hindi tinutuloy iyong pagsasaka sa kanilang palayan ay kung nasira iyan, mahirap maibalik at kung tataniman man ay kakaunti ang maani at wala na ring silbi.*

(So now that they have left, the land is now abandoned? One reason he said why they do not continue farming their rice fields was because it is hard to recover it when it was destroyed. They get less produce from planting. So it is useless.)

COMM. PIMENTEL-GANA:

So maihahantulad mo rin ba itong mga pangyayari na umaalis ang mga kabataan at gusto na nilang mag-aral at magbagong direksyon sa kanilang mga buhay ay dahil din ba sa hirap na dinudulot ng panahon? Meaning to say, dahil sa hindi mo rin ma-plot kung kailan ka, iyong regularity of your harvest or your planting, eh nahihirapan na rin silang ipagpatuloy ang ginagawa ng kanilang mga magulang? Sa tingin nyo ba ganoon iyon?

(Do you mean that the preference of the youth to study and change their lives' directions can also be attributed to the difficulties brought about by the changes of the climate? Does it mean that the unpredictability of planting and harvesting is the reason why they do not want to continue what their parents are doing?)

MR. MAMANGLO:

Yes, Ma'am because for me that was a personal experience. When I was eight years old, I stayed in our place because both my parents are also farmers. *Malaki ang lupang sinsasaka namin, pero kapag ikinumpara mo sa lowland, maliit lang talaga.* But *sa amin*, in Ifugao, *kapag ganoon ang rice field, we have a vast land to work on.* And I tried, *gumagawa ng pilapil,* then everything *kaugnay sa pagtatanim.*

(Our family owns a big rice field that is sufficient for us. But compared to the lowland rice field, it is small. In Ifugao, we have vast lands to work on. And I tried to make embankments and other farming-related tasks.)

But when the time comes *na nararamdaman ko na... na parang mahirap kasi napapagod ka na nga hindi pa sumasang-ayon iyong panahon minsan. Basta na lang uulan, o basta na lang umiinit iyong panahon at nagbibigay ng sakit.* So *doon, parang mga* second year highschool *na ako noon ay na-*discourage *na ako na magtrabaho sa palayan dahil hindi mo talaga mamalayan kung uulan ba ngayon.* Like, for example*, papasok ako, magta-trabaho habang gumagawa ng pilapil ay biglang uulan.* If after one hour *wala na naman, iinit, babalik ka, uulan na naman eh kinagabihan, nagkasakit ka. Eh, ito, parang na-discourage na ako, umalis na ako doon sa baryo, nakitira na ako sa mga parents ko. Iyon,* that is a personal experience*lang iyong na-shareko*.

(I felt how hard and tiring life is because of inconsistent weather. It would alternately rain then shine, and this leads to sickness. When I was in second year highschool, I got discouraged to work in the fields because you could not predict when the rain will come. For instance, when I worked in the fields while making the embankments the rain suddenly poured down. Then, it stopped and the sun shone after an hour. Then, I tend to go back and same thing would happen. At the end of the day, you'd get sick. I was somehow discouraged. I left our neighborhood and lived with my parents. There, that was a personal experience I just shared.)

COMM. PIMENTEL-GANA:

Salamat po. (Thank you.)

PANEL CHAIR CADIZ:

Maraming salamat. (Thank you very much.)

Chairman Gascon, your questions?

CHAIR GASCON:

Thank you, Commisioner Cadiz, the Chair of our Inquiry Panel. Una, magpapasalamat na ako sa inyo Ginoong Buucan, Ginoong Mamanglo, at Binibining Naliw sa inyong pagbibigay buhay, hugis, ng inyong ginagawa bilang katutubo sa Ifugao. Mahalaga po para sa amin iyong maunawaan ang kabuuan ng pinag-aaralan nating impact ng climate change sa buhay ng iba-ibang tao sa iba-ibang kondisyon. Kaya mahalaga sa akin at tumungo kayo dito. Nagpapasalamat kami na kahit malayo ay nandito kayo.

(First, I would like to thank Mr. Buucan, Mr. Mamanglo, and Ms. Naliw for giving life and shape to what you have been doing as indigenous peoples of

Ifugao. It is important for us to understand the holistic aspect of this discussion, the impact of climate change to the lives of other people in different conditions. That is why for me it is important that you came here. I am thankful that you are present here even if it is far.)

Sesegundahan ko lang iyong ibang mga pilit naming maunawaan na mga tanong dito. Ang partikular na gusto kong unawain iyong gaano kalaki iyong, alam nating mahalaga na nabanggit ninyo na World Heritage Site ang inyong rice terraces, pero gaano kalaki iyong pagkatali ninyo bilang katutubo doon sa pagtatanim at pag-aani sa mga rice terraces? Nabanggit ninyo, may ilang mga tribo, kakaiba talaga ang rice terraces pero sa kabuuan ng Ifugao, gaano kalaki po ba ang sakop ng terraces, ilan pong bayan, ilan pong tribo, ilan pong tao over time, meaning to say,fifty (50) years ago noong kabataan po ni Ginoong Buucan,thirty(30) years later, and so on. Gaano kalaki po iyong sakop na area? At iyong dependence ng komunidad doon sa terraces na iyon?

(I would just support the various points that we are trying to understand. It is important that you have mentioned that your rice terraces is a World Heritage Site. But as natives, how big is your commitment to farming and harvesting in the rice terraces? You have mentioned that there were several tribes that made the rice terraces really unique. In total area of Ifugao, how big is the coverage of the terraces, how many towns are there? How many tribes? How many people over time, meaning to say, fifty (50) years ago when Mr. Buucan was still young, then thirty(30) years later, so on. How extensive is the area and the dependence of your community in those terraces?)

MR. MAMANGLO:

We have eleven (11) municipalities in the province of Ifugao. Nine of these municipalities have rice terraces in which people are dependent upon for livelihood and as a source of food security. And four of these municipalities, their rice terraces are inscribed as a World Heritage Sites. Two municipalities are lowlands, *meaning, iyong mga rice fields nila is lowland talaga. Sa kasalukuyan po, wala po akong nakikita o nababasang* measurement *ng aming* rice terraces. *Ang nabasa ko lang sa* monument *ng UNESCO, ang sinabi lang doon* (meaning, their rice fields are really in the lowland. At present, I have neither seen nor read any measurement of our rice terraces. I have not read what was the exact measurement of our rice terraces. What I just read from the monument of UNESCO is), "The rice terraces of Ifugao, if the walls are placed end-to-end, they would reach halfway around the earth." And I don't know *kung ano ang* description *noon. So ganoon lang dinescribe ang* rice terraces. (And I do not know what the description was that time. So that's just how they described the rice terraces.)

CHAIR GASCON:

So we can say that the Province of Ifugao, the terraces are unique. There are no other provinces elsewhere in the north that have this? Of the eleven (11) municipalities, two (2) are lowland, but all the highland municipalities have terraces. Could you say that these nine (9) municipalities are significantly dependent over the production of the yield of the terraces? Or is the economy in these nine municipalities diverse? How much percent of the tribal communities actually work in the land over time?

Tinatanong ko kasi iyong over time kasi gusto kong unawain kung may impact, may direct relation. Kung dati, halimbawa fifty percent (50%) ng tao nagta-trabaho sa lupa, pero dahil sa init at hindi na malinaw na pagdating ng ulan, o lakas ng ulan ay lulan nito ay ang pag-likas. Na-mention kanina ni Ms. Naliw na ang kanyang mga magulang napilitang lumikas para makadagdag sa kanilang kita. So iyon lang ang gusto kong unawain, eh. Kung dati ay sapat ang yaman na naibibigay nito, kaya nga po mayroon po tayong kulturang baki dahil nagpapasalamat po kayo sa ani, at ngayon ay nawawala ito, dahil nga po sa klima.

(I asked this because over time, I like to understand if there is an impact or direct relation. Say, if fifty percent (50%) of the people are working in the fields before, then because of the heat and the uncertainty when the rainy season would come, or the intensity of the rain – you have reasons to evacuate. It was mentioned a while ago that Ms. Naliw's parents were forced to leave in order to augment their means because they cannot depend only on farming. So that is what I want to understand. If before, the harvest was sufficient, we had the *Baki* culture to thank for the harvest. And now it's disappearing because of the climate.)

MR. MAMANGLO:

Yes, Sir. Talagang may time na talagang ang karamihan sa mga tao ng Ifugao, tulad ng Banaue, as a personal experience, ay talagang nagta-trabaho doon sa kanilang mga rice fields. At aking na-witness iyon, na sabay-sabay pa kaming mag-ani lahat ng mga tao doon. Everyday na lang is parang celebration kasi nag-aani sila at nagba-baki sila. So there is a continuous community affair hanggang sa matapos ang ani.

(Yes, sir. There was really a time that, based on experience, most of the people of Ifugao, like in Banaue, were really working in their rice fields. And I have witnessed that. We collectively harvested with all the people there. Everyday was like a celebration because they were harvesting and performing the *Baki*. So this was a continuous community affair until the harvest was done.)

CHAIR GASCON:

Like it is part of the way of life.

MR. MAMANGLO:

Yeah, it is part of the way of life. Kasi talagang pina-practice iyong mga ganyang kultura. Pero sa panahon ngayon, eh, kumakaunti, nawawala iyong mga ganyan, nawawala na rin iyong enthusiasm ng mga tao sa pagtatrabaho sa field. Kung tinatanong mo kung ilang porsyento ang parang ayaw nang magtrabaho sa field, eh, wala po kaming naitalang record diyan. Pero sa pagkakaalam po namin, talagang based on experience, bumaba talaga ang bilang ng nagtatrabaho sa rice fields.

(Yeah, it is part of the way of life – those cultural practices. But this time, these are slowly disappearing. The enthusiasm of the people to work in the rice fields is also gone. If you are asking how many percent of those who most likely did not like to work in the field, we were not able to record that. But what we know, based on experience, the number of those working in the rice fields are getting less.)

Paano namin napapasinsin? Kung planting seasonna, makikita mo iyong mga nagpa-plant bibihira na lang kung lalapit ka pa. Iyon iyong mga tao. Like, for example, nag-plant dito, kinabukasan doon. So meaning, in one community, you can only find twenty (20) people who are doing the thing which is supposedly noon ay community. Dapat siya ang magtrabaho safield niya. Ako, ako din. Eh, ang nangyayari ngayon, is puwede niya akong i-hire as laborer para trabahuin iyong field niya. So meaning, nag-extinct iyong farmers namin sa Ifugao.

(We have noticed, it if it is planting season, you can see those who are planting. If you observe closer, they are getting fewer. For example, in one community, you can find only twenty (20) people who are doing the thing which was supposedly a community affair before. It should be the owner working on his rice field. What is happening now is he can hire a laborer to work in his rice field. So meaning, Ifugao farmers are in the brink of extinction.)

CHAIR GASCON:

How about as a percentage of the local economy? Has the shift moved away from agriculture dependence to tourism or other livelihood?

MR. MAMANGLO:

Ah, yes. Nag-boom iyong place namin as a tourism industry. Malakas po ang tourism namin doon. Isa sa mga factors na rin kung bakit kumaunti iyong mga farmers namin, kasi iyong mga farmers sa amin, nag-aral na lang na mag-tour guiding, eh nagga-guide na lang ng mga turista.

(Ah, yes. Our place has a booming tourism, which is really great. That is also one of the factors why there are lesser farmers. Farmers are training to be tour guides, instead.)

And one (1) more thing, iyong iba ring mga farmers, like for example, sa Battad, sa kanila, maraming pumupuntang mga bisita. Eh, nakita niya ang potential ng turismo, sabi niya sa sarili niya, "Magpatayo na lang ako ng bahay ko dito at gagawin kong home stay or lodge."

(And one more thing, farmers, like for example, there in Battad, there are many visitors who go there. One farmer saw the potential of tourism and said to himself, "I will build my house here and make it as home stay or lodge.")

So kinu-convert na rin iyong mga land area para magiging lodge or restaurant. Tama po kayo, Sir. Iyan iyong nangyayari ngayon. There is a shift from agriculture to tourism and commercial-related activities. Very rapid iyong shift. Karamihan nga is mga babae nafarmers, guide na talaga ngayon. They would just prefer to be invited by DOT for a training to be accredited as a guide rather than going to the farms. So sila lang ang magsasabi sa turista, "Ito iyong ginagawa ng Ifugao," pero hindi na nila ginagawa. So there is really a rapid deterioration of the numbers of farmers in our place. Iyan ang pinakaproblema namin ngayon.

(So they also converted the land to build lodges and restaurant. You are correct, Sir. That's what is happening there now. There is a shift from agricultureto tourism and commercial-related activities. The shift is very rapid. Most of the female farmers are tourist guides now. They prefer to be invited by DOT for a training to be accredited as a guide rather than going to the farms. So they are the only ones who tell the tourists, "These are what we are doing in the Ifugao rice terraces" but they are not practicing it now. So there is a rapid decrease in the number of farmers in our place. That is our prime problem as of now.)

CHAIR GASCON:

Dumami na po ang mga (There is an increasing number of) B and B. Ifugao Bed and Breakfast.

MR. MAMANGLO:

Mas madami talaga. If you go to Banaue alone, and in some heritage sites, kino-convert nila iyong bahay nila as homestays. So meaning, marami na ring turista, maraming polusyon na dinadala.

(It has definitely increased. If you go to Banaue alone, and in some heritage sites, they convert their houses into homestays. So meaning, there are lots of tourists as well as pollution and garbage.)

Like when we conducted a clean-up activity in one of the World Heritage Site, just last month, *nakita namin ang epekto ng turismo. Bultu-bultong plastikang nakatambak doon sa lugar na iyan* (we saw the effecr of tourism with the amount of garbage accumulated in our place). *Eh,* there is no way *na ilalabas nila* (to take out the garbage) because the roads did not reach that one and our garbage truck cannot reach that place so *naiipun-ipon doon* (everything just piled up) until we conducted that outreach program to collect all plastic garbage in that place. *Eh, ilang trucks iyong nakuha namin.* (We collected truckloads of garbage).

CHAIR GASCON:

Speaking of tourism and migration, *na*-plot *na po ba ninyo sa* community (Have you surveyed the community) to determine who are still dependent on agriculture and who have moved away?

You said that people have gone to Baguio and to Manila in the meantime, and so, too, have the immigration of lowlanders. Has that also increased or short-stay because of the global information about the beauty of the place? I understand that there was a multi-million dollar movie that showed your terraces at the end. Did that result in more visits from tourists, that have decided as they did for example in Boracay, you mentioned Boracay, to actually stay and build their own homes and create their own economic activity not just come in and out. Have you plotted that migration and out-migration and immigration?

MR. MAMANGLO:

Yes, Sir. In our case we have a lot of people going outside our place because of the hardship of life, especially to be independent on our rice terraces. Inasmuch as we also accommodate some people from other places who would want to live with us, and I would cite you a concrete example. There is one from Batangas who I know is a millionaire, and when he visited Banaue, he

admired the place. So he buys a house and lot amounting to around eight million and he regularly visits the place. I know also of a U.S. retiree who came to our place and built a house in the mountains and adopt children as his scholars bringing them to school because they appreciate the place.

I know also of one, thirty (30) or thirty-five (35) years ago, when he visited Banaue, he married in Banaue, he married an Ifugao, and let his Ifugao wife go abroad, and he stays in Ifugao. Those are some cases, we are also adopting people from different tribes coming to our place.

CHAIR GASCON:

Thank you. I think, si Mr. Buucan, *mayroon po kayong gustong sabihin?* (Is there anything else you would like to say?)

MR. MAMANGLO:

(Translating Mr. Hangdaan's reply in Ifugao) If our people migrate, the tendency is they go to some other places, they marry and they stay there. The problem is they rarely come back.

Iyong iba pa, hindi na umuuwi.So nagiging abandoned*na iyong* rice terraces *nila, kung mayroon man sila. Pero* I will tell you*na karamihan sa mga Ifugao, kasi kaunti pa lang iyong mga tao noon, may* rice terraces *sila*. So I would say*na*majority of people *noon may* rice terraces *talaga*.

(The others also did not come back. So the rice terraces were abandoned. But I would tell you that most of Ifugao have rice terraces since it was not so populated before. I would say that majority of the people before really owned rice terraces.)

CHAIR GASCON:

Mr. Chair, I just want to ask the Counsels for the petitioners, if it might be possible to provide us with documentation or evidence. Because what we have been hearing is anecdotal. "I heard of this, or heard of that." But you know, if it might be possible for you, after presenting a very important issue on the impact of climate change on culture and on indigenous practice, to see if, in fact, as many of our Commissioners are wondering, is it as a result of climate change, or is it as a result of other factors? And we'd like to be able to better appreciate the link of the increase in temperatures or rainfall on the way of life in the area as it has been described. Maybe in a form of some position paper or evidence, to suggest a work time that with the rise in temperature and

rainfall, the impact on the activities can be directly correlated. Thank you, Comm. Cadiz.

ATTY. MAYO-ANDA:

Thank you, Your Honors. In response to Chairman Gascon's suggestion, we will endeavor, Your Honors, to secure these documents. But our preliminary visits there have actually yielded the lack of adequate information and research on that specific concern. And that is why when we were asking Mr. William, he's also not knowledgeable. But we will endeavor to secure important documentation. And we will make the appropriate manifestations after this hearing.

PANEL CHAIR CADIZ:

Thank you very much, Chair Gascon and Counsels.

Dr. Walpole, would you have some questions for the witnesses?

DR. WALPOLE:

If I may very briefly, I like to clarify the three (3) steps. *Magandang umaga sa inyong lahat, at maraming salamat sa iyong* presentation. *Ngayon, iyong* presentation *mo, William, kanina. Hindi kayo nag-aabot, nakadating sa dulo pero parang may maraming programa na sagot sa inyong* situation. *Maraming* research *pero kulang at ito ang problema.*

(Good morning to all, and thank you very much for your presentation. Now, about your presentation a while ago, William. You were not able to finish but there were many programs that answered your situation. There are many researches but they are still inadequate and this is the problem.)

So you are looking at the communal irrigation systems and how they are being addressed. The documentation of the rice terraces flora-fauna on your own witnesses. What I understand is, partly in this presentation not presented fully here is that you are asking for more support for the needed research and documentation. *Totoo ba iyan?* (Is that true?)

MR. MAMANGLO:

Yes *po.*

DR. WALPOLE:

Okay. Now, sa pagkuwento ninyo sa buhay ninyo, para klaro sa akin, paki-confirm o hindi na mga twenty (20) years ago, so around 2000 po, nasabi ninyong parang nagbago, parang dumating sa threshold, sa impact. Masyadong mainit, iba din iyong klima, iba din iyong pag-uulan. Yeah?

(Now, as you look back, I would like to clarify, so please confirm if it was like twenty 20 years ago when the threshold, the impact came. So around 2000, you mentioned that it is as if something changed. It was extremely hot, the weather as well as the rain was different. Yeah?)

MS. NALLIW:

Two thousand.

DR. WALPOLE:

Okay, so parang ganyan iyong shift. Yeah? So the timing is helpful. So yung ikatlong tanong ko lang is I'm focusing sa mga apat(4) na dahilan ng low production. Yeah? Sapresentation ninyo at saka iyong conversion of rice terraces.

(Okay, so that is how the shift was. Yeah? So the timing is helpful. So my third question, I am focusing on the four (4) reasons why there is low production. In your presentation, you mentioned the conversion of rice terraces, to what use?)

Because this is the biology of physical climatic shifts. So may apat (4) na bagay na sinabi mo diyan. Iyong natural calamity, we know it is brought about by the rainfall and the landslides, the impact, the low soil fertility, inadequate water supply, pest and disease, ay siyempre kung mas mainit, ibang klaseng pest na. Kagaya ng niyog kahapon. Kaya pasok iyong ibang pests.

(So you have mentioned four (4) things there. The natural calamity, we know it is brought about by rainfall and landslides, the impact, the low soil fertility, inadequate water supply, pest and disease, and of course, if it is hotter, there would be different kinds of pests. Just like the coconut pest discussed yesterday, that is why other pests are coming.)

MR. MAMANGLO:

Yes.

DR. WALPOLE:

Do you understand this is being brought about by the reduction of forest cover in the area?

MR. MAMANGLO:

We don't.

DR. WALPOLE:

Alam ba iyon? (Is it known?)

MR. MAMANGLO:

Ay hindi po. (No.)

DR. WALPOLE:

Ano iyong hektarya? (What's the hectarage?)

MR. MAMANGLO:

Kung ilan na? We can get or secure some information *doon sa* DENR. (How many? We can get or secure some information from the DENR.)

DR. WALPOLE:

Yeah, dapat maging klaro kung natuyo iyong mga sapa diyan dahil sa pagputol ng kahoy o sa masyadong mainit sa tanghali, parang ganyan. So mabuti kung may kaunting information. Yeah, if that can be compiled… So iyan lang po.

(Yeah, it has to be clear whether the creek got dry because of the cutting of trees or because of the noontime heat. It would be good if we could have some information. Yeah, if they can be compiled along with… So that's all.) *Maraming salamat.* (Thank you very much.)

MR. MAMANGLO:

(Translating Mr. Hangdaan's reply in Ifugao) According to him, yes, it is true that because of the cutting of trees, there is less and less water coming from the mountains to supply the rice terraces and human needs, and if there are some existing water reservoirs in the mountains, the tendency is the owner of that mountain or that forest will go and buy and connect a hose to direct water to his house. That's also disrupting the irrigation of the rice terraces.

And what you are mentioning earlier, Sir, on low productivity, on pest and disease, it is true that because our rice terraces in Ifugao *ang kailangan niyan* is *lagi talagang may tubig* (need a steady supply of water). But, unfortunately, because *kinukulang kami ng tubig, kapag nilagyan namin ng tubig at nagtanim kami, ay natuyo. Pero bumunga na iyong rice namin, and wala ngang makukuhanan ng tubig.* The tendency is the rats will just go there and destroy the palay. Not when it is wet *na laging may tubig, hindi naman talaga pupunta doon,* let us say, *iyong mga pest, kasi siyempre malulunod sila.*

(Unfortunately, because there is a scarcity of water, if we irrigate and plant on them, eventually they will just dry. When the rice grains sprout already, and there is no water supply, the tendency is the rats will just go there and eat the rice grains. Unlike when it is always with water, then the pests cannot go there because they will drown.)

PANEL CHAIR CADIZ:

Maraming salamat. (Thank you very much.)

I have no questions for the witnesses.

ATTY. MAYO-ANDA:

Thank you, Your Honors.

PANEL CHAIR CADIZ:

You have heard the manifestations. You are excused.

MR. HANGDAAN, MR. MAMANGLO, AND MS. NALIW:

Maraming salamat, Thank you.

PANEL CHAIR CADIZ:

Counsels, do you prefer that you have a five-minute break before you present your next witness?

ATTY. MAYO-ANDA:

Yes, Your Honor.

PANEL CHAIR CADIZ:

Alright, thank you. We will go on a break.

[Bangs gavel]

[Break]

CLERK OF THE INQUIRY:

All rise. The Honorable Inquiry Panel Chairman Comm. Roberto Eugenio T. Cadiz still presiding. Everyone may now be seated.

PANEL CHAIR CADIZ:

[Bangs gavel]

Counsels, may we now have your next witness?

ATTY. PAUDAC:

Your Honors, we are calling in our next witness, Dr. Niel Aldrin Mallari.

PANEL CHAIR CADIZ:

Please swear in the witness.

CLERK OF THE INQUIRY PANEL:

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 law?

DR. NIEL ALDRIN MALLARI:

I am Niel Aldrin Mallari, from Silang, Cavite. I am a Filipino.

ATTY. PAUDAC:

Your Honors, Dr. Niel Aldrin Mallari is Founding President, Biodiversity Integration Specialist, and Chief Scientist at the Center for Conservation Innovations, Incorporated. He obtained his Dr. of Philosophy in Ecology, Conservation, and Management at Manchester Metropolitan University, United Kingdom.

He has twenty-five (25) years of professional experience in environment and biodiversity conservation, specifically wildlife conservation, habitat restoration, climate change mitigation and adaptation, strategic planning, environmental program design and evaluation, knowledge management and capacity building. He has also more than twenty (20) years of experience in environment policy framework, having co-developed the Philippines Protected Areas Masterplan and contributed to the National Biodiversity Strategy and Action Plan for the convention of Biological Diversity for the Philippines.

Your Honor, before we proceed with the testimony of Dr. Niel Mallari, may we be allowed to ask questions for the identification of documents?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

Good morning, Dr. Mallari.

DR. MALLARI:

Good morning *po*.

ATTY. PAUDAC:

I have three (3) documents, and I'll be showing these to you. The first document is a Statement of Niel Aldrin Mallari, Ph.D. Ecology, dated August 13, 2018, consisting of one (1) page, previously marked as Exhibit "TTTTT." The second document is a Curriculum Vitae, consisting of seven (7) pages, pre-marked as Exhibit "UUUUU" to "UUUUU-6," and finally the last document is a printed "PowerPoint Presentation of Niel Mallari on Biodiversity and Climate Change" consisting of seventeen (17) pages, pre-marked as Exhibit "BBBBB" to "BBBBB-16." Dr. Mallari, could you confirm if you submitted these documents to this Honorable Commission and to this representation?

DR. MALLARI:

Attorney, I confirm that I did this papers and I submitted this on my own volition.

ATTY. PAUDAC:

On the first document, Exhibit "TTTTT," there appears a signature above the name Niel Aldrin Mallari, Ph.D. Whose signature is this?

DR. MALLARI:

Yes, this is my signature, and I entered the signature myself.

ATTY. PAUDAC:

Do you confirm and affirm the statements you mentioned in these documents?

DR. MALLARI:

Yes, I confirm that.

ATTY. PAUDAC:

Thank you, Dr. Mallari.

PANEL CHAIR CADIZ:

For the record, may we ask the clerk of the Panel to confirm the markings that were cited? Alright, just for the record.

Please proceed.

ATTY. PAUDAC:

Thank you for the confirmation, Atty. Esguerra. Dr. Mallari, you can proceed now with your presentation. Oh, by the way, Dr. Mallari will give a testimony and share his expertise on the topic of "Climate Change Vulnerabilities of the Philippine Biodiversity." Dr. Mallari, please.

DR. MALLARI:

Honorable Commissioners, *mga higala, mga igsoon, maayong paldo kekayungan, asalamalaykum wara, matudmulet maturiheko abarahaku.*

Today, I would like to present some evidence from our work on research over the last twenty (20) years showing the nexus of biodiversity and climate change. Biodiversity would be the lens that I'll use this morning and, as you know, biodiversity is the total variety of life on the planet. And I'll use that as a lens for now. Biodervisity for us is the barometer of the health of the ecosystem.

Megadiversity countries is the term used to refer to world's top biodiversity rich countries in the world. Biodiversity is by no means evenly distributed in our planet. Some countries, especially in the tropics, harbor far greater concentrations of biodiversity than others – the Philippines, being one of them, and being one of the tiniest of seventeen (17) or eighteen (18) mega-diverse countries. The Philippines comprises seven thousand (7,000) islands covering more than three hundred thousand square kilometers (300,000 sq. km.) The country is of crucial importance to global biodiversity because of its exceptional levels of narrow endemism, both on the terrestrial and the marine. In fact, if you would look at this table, sixty-one percent(61%) overall endemism for terrestrial vertebrates or six (6) out of ten(10) animals that we see in the Philippines are found here and nowhere else.

If you compare that with Spain, which is about, in terms of size, twice bigger than the Philippines, but if you see the endemic species, we have ten(10) times more than that. And if you compare the Philippines with Brazil, which is about twenty twenty-eight (28) times bigger than the Philippines, we have twice as many endemic species here than in Brazil. That, I hope, puts a big exclamation point why the Philippines, as tiny as it is, is very important for biodiversity.

Often I always use this in my class just to describe the Philippines as one-seventeenth (1/17) of Noah's Ark. If one-seventeenth (1/17) of that is contributed by the Philippines, if you remove the Philippines, one-seventeenth (1/17) of the world's biodiversity will be obliterated. And that is our moral responsibility to the world.

Unfortunately, all of these mega diversity countries, including the Philippines, are facing severe threats. This slide alone, although this is not very recent, it's 2009, shows you the number of species that are at the threshold of extinction. It's quite staggering. And as you can see here, most of the species are really at the brink of extinction.

We have the most number of threatened species per unit area. And if you look at the sort of habitat that these threatened species need, the most important habitat type would be the forest, and next would be the wet lands.

Looking at the history of deforestation, our country suffers from the problems relating to impoverished, large and rapidly increasing population, a gross loss of forest cover at lower elevations especially, and many unsustainable land-use practices. These factors have resulted in the Philippines supporting by far the largest number of critically endangered species of birds, for example, which is higher than any country in the world.

In fact, if you would compare the number of critically endangered species that have fifty percent (50%) chance of extinction in the next five (5) years – the Philippine Eagle is one of them – we have exactly the same number of threatened species, critically endangered species with India, India being super large. So species per unit area, Philippines is really, really important.

And so, the crisis, the biodiversity crisis is staring us in the face. This is the tamaraw. We recently did the analysis and we see that its range has contracted by one hundred percent (100%). So we are looking at a very, very tiny spot in Mindoro and, by the way, tamaraw is only found in Mindoro and nowhere else. And if this tamaraw gets extinct, alongside that is the culture of the Mangyan people.

Now, let me talk about climate change for a bit. We know for a fact that climate change is because of the accumulation of greenhouse gases and this table here shows us the contributors of greenhouse gases. And here on the

right side, you would see the greenhouse gas contribution from the land uses. I'll focus on the land uses at some point, but also allude to the ones contributed by the industrial sources.

And if you look at this pie chart, you would know that the contribution, deforestation, and other land use changes are at par with the contribution of electricity and heat production. And larger than the industry and transportation in fact. But together, these contributors are putting a lot of our biodiversity in a lot of stress.

So where is the nexus then? Biodiversity loss and climate change share a common issue and this is deforestation. The sad fact is that to us, it's a double whammy for biodiversity. Deforestation by far is the biggest driver of biodiversity loss. And earlier on, we know that deforestation contributes to the greenhouse gases and climate change. And the next whammy would be that climate change accelerates biodiversity loss. And I'll give you evidences for that in a minute.

First evidence I'd like to present to this body is the *tandikan*. This is the Palawan peacock pheasant. This is the only peacock pheasant we have in the country, and found only in Palawan. This is a lowland species. It's found in lowland forest and if you would notice the graph there, it shows that this species cannot survive outside the forest. The better the quality of the forest, the better is its population.

Our study stands from 2006 to 2018, so quite a robust data. And we have noticed a shift also of the rainy season, particularly between 2009 and 2010. Rainy season came in earlier. Normally, the onset of the rainy season would be towards the end of May. And before that would be the peak season for breeding of this magnificent species. And so, summer has shifted. The months where we expect sun or summer, it's raining. We have recorded in this span of ten(10) years that there have been a marked decrease in the population of the *tandikan,* which corresponds to the shift of the rainy season. We suspect that the early onset of the rainy season has disrupted the breeding cycle of the species.

In the animal world, behavior is modified by external stimulants and is passed on through acquired learned behavior and adaptation and this is taught by imprinting. But there is a time lag between this adaptive behavior. We fear that the repeated severe weather incidence is confusing the species. And we might be looking at severe drop in its population in next 10 years.

Let me shift to another species, *pasensya na po, puro birds ito* (these are all birds), this is my expertise. This is a bleeding heart pigeon. This is the only bleeding heart found in Mindoro. If you can see the reason why it is called a bleeding heart, it has a red spot on its breast, so bleeding heart. Like I am at

the moment. We all are. Because of the sad state of the Philippine environment.

Based on our modelling, like the *tandikan*, this is a lowland species. The map on your left shows you the model that we did when we overlay the Landsat image of 1988, and the 1988 bioclimatic data that we got from WorldClim. And it shows that suitable habitats point to lowland forest in Mindoro at the fringes of this island. The center of the island is a big mass of a big mountain. And so this confirms that this species is a lowland species.

But when we overlay a model of the 2010 forest cover and the 2010 bioclimatic data, we have discovered that there has been a major shift in the distribution with species. So there's a big movement from the lowland, it has shifted to high elevation. This is attributed to the severe loss of lowland forest in Mindoro. But we can see here that the species is living in a sub-optimum level. The species is now classified as critically endangered, fifty percent(50%) chance of extinction in the next five (5) years.

To add to more evidence base, when we look at the bioclimatic predictors, in 1988, the environmental predictor for this species is land cover, obviously forest and annual mean temperature. So obviously, this species doesn't want any adverse changes in temperature. But by 2010, you would notice that the heaviest model would have been mean diurnal range. Meaning, the average temperature during the day. So it has shifted upwards and it mimics, it looks at places that mimics the condition of the lowland forest. So you're seeing species that are pushed upwards because most of the forest down in the lowland are gone. And previously I've said that temperature is really important for this species.

Let us take another example, another bleeding heart, which is found only in Negros. A different species, also a threatened species critically endangered, and found only in lowland forests. It tells us a similar story. Its suitable habitat has contracted dramatically from 1988 to 2010. Its survival envelope has a significantly contracted or shrunk, it has shrunk. The evidence now tells us that in 1988 this species would have been affected. Its optimum habitat, its optimum living condition or what we call survival envelope is determined by isothermality. Meaning, it likes places where temperature remains, you know the fluctuation is quite not too drastic, it's constant.

But by 2010, because the forest has been decimated in most of Negros Island, most of this species has moved up to higher elevation and its requirement of isothermality has been shared by land cover and slope. So essentially, what this model is showing is that the species is hanging on to their lives because temperature has gone up where they naturally occur.

Moving out of the sort of species vortex now, I'd like to show a case study on Marikina watershed and Ondoy and in so doing, I'd like to remind us because we Filipinos have very short memory, that Ondoy happened and it's not fake news.

We tend to forget that all these freak extreme weather events have paralyzed the economy in recent years. The economic cost is staggering. Let me show you some maps and some of our analysis looking at the Upper Marikina Watershed, the protected area, and Kaliwa watershed which is another protected area that covers upper Marikina watershed. This analysis of the satellite data is between 2001 and 2014. So you would see here that there are lots of red areas. These red areas are the recently deforested portions of Marikina watershed.

There's evidence now that show that the degradation and deforestation is directly linked with the increase in populations especially in Upper Marikina. To us, the important element is this, what we call, the tipping point, where the increase of population and decrease of forest cover meet. Because beyond that you would see an exponential effect, but after Ondoy, you would see that many organizations, private sectors for that matter, have banded together and slowed down the decrease in forest cover. Although there's a positive effect of that, it is by large a downhill trend.

If you look at the other, the twin protected area, it shows you this same downhill trend. And let me point out that at the point after Ondoy, you would see a spike in population. This is attributed to the fact that a lot of the refugees, if you like, the environmental refugees, were relocated in the Marikina Watershed and it is fueling that sort of vicious cycle. And that, to me, is something that reflects on how poor planning exacerbates the condition that we are now in terms of environment and climate change.

So in our projection, this is 2014, by 2021 this is how it would look like because of too many people up there in the watershed. Let me go back for a bit. That's 2014 and that's 2021. We project that we will lose around five thousand (5,000) to ten thousand (10,000) hectares in the next five years. And that's something that's really, really scary. Another Ondoy would trigger another catastrophe.

But going back to the biodiversity, biodiversity to us is the indicator. Most of the vulnerable species now in the Upper Marikina Watershed are now absent. This is the Luzon form of the bleeding heart. The indicators of the quality of water and extent of forests are disappearing rapidly as well.

This is a kingfisher, an endemic one. It's found only where you have really clean rivers. We've only counted very, very few of this in Upper Marikina Watershed. The indicators of improving quality and extent of forest are almost

gone as well. This is our alarm clock. It calls at five AM, twelve PM, at twelve noon, and five P M. If this species gets extinct, there's no chance for our forests to regenerate naturally. Because they eat the seeds, without the seeds passing through their digestive systems, they won't germinate.
So even if we do NGP to death, we cannot recreate a natural forest without these natural farmers of forest. So it brings us to why this manifestation is biodiversity focused. Climate change exacerbates the dark condition of our biodiversity and biodiversity being the building blocks of our ecosystem. Our already fragile ecosystems are now facing yet another threat, climate change.

So to me, we have a medical doctor here, to me, I cannot separate biodiversity loss due to deforestation and climate change at this point because, to me, they are sort of syndrome now. You cannot separate one from the other. Especially now when we have less than twenty percent (20%) forest cover. The UPLB came out with a seminal work that said, "For the country to maintain its natural processes: air, water, hydrological cycle, it needs forty-five percent (45%) forest cover." Most of our islands, my friends, have less than twenty percent (20%). Cebu has less than one percent (1%), Negros three percent (3%), Mindoro has five percent (5%). And the destruction really is real, it's not fake news.

In conclusion, climate change action is not about the propaganda, it's not about the CSR. Nor is it just planting trees and buying credits. To me, it's creating that safe operating space for me, for my children, and for people in the planet. *Salamat po*. (Thank you).

ATTY. PAUDAC:

Thank you, Dr. Mallari. Your Honors, may I be allowed to ask some questions?

PANEL CHAIR CADIZ:

Yes, of course. Please proceed.

ATTY. PAUDAC:

Thank you for your very good presentation, Dr. Mallari. Earlier, you mentioned about the extinction of the tamaraw, and then also relating it to the culture of the Mangyan, which is also, I am not sure if it's not being practiced or if it's affected. I'd like to understand the link, if there is any, between the extinction of the tamaraw, then the climate change that you are mentioning, and then how it affects the culture of the Mangyan people because also I

wanted to understand it because earlier we do have Ifugao witnesses who actually spoke about the extinction also of their culture.

DR. MALLARI:

Thank you very much. With our friends from Ifugao, I confirm that a lot of the species that we work on shifted their survival envelopes alongside the shift in the weather patterns. If you are, well all of us are living things, you would always want, you know, an optimum level of environment for you to live. That is what is happening in Ifugao. There is a major shift in climate regime and, in fact, in ecology, we also call them as climate curtains when you have, you know, when you're out there and it's raining here and five meters (5m) away it's not, it's still sunny. When you are near forest, rainforest, rain shadow effect, you have wet areas and dry areas. When you have climate change, all of this climate curtains get disrupted and where you have dry areas when it is expected to be dry and there's rain and flooding.

With the tamaraw, this is what is happening. The tamaraw is normally a lowland species. It likes grasslands. But because of, and traditionally, this is hunted by our Mangyan brothers for protein. But because there is much pressure from the *unats,* from us, lowlanders, for bush meat, exotic meat, we pay Mangyans to hunt and sell the meat because it's exotic. And what is happening is that the population of the tamaraw crashes.

But alongside that, because it needs grasses when the great El Nino in the mid-nineties, late-nineties when we were running around the country looking at, investigating the impacts of so many forest fires that we have. That is because we had prolonged periods of drought and, therefore, the wettest of the wettest forest, which is the Philippines, has become very dry and very prone to forest fires. And when that happens, again the species become, you know, they're driven out of their comfort zones and they migrate and they become outcompeted and so on.

But going back to the tamaraw, much of their habitats in grassland because they are now *siyudad* (city) or they're now human habitations, they rebreed to upland. And this is the same with the Mangyans. Their ancestral land, that they're being driven away from their ancestral lands because they don't have their titles and as they're driven out so is the tamaraw being driven out.

What we are seeing now and also we've seen this in Sibuyan Island is the erosion of the culture of Mangyan because of the introduction of cash economy. But, of course, that's a side story. We were seeing a shrinking area for traditional upland farming for the Mangyans and were seeing a shrinking of the natural foliage area of the tamaraw. My fear is that at the moment, the current count is about five hundred (500) individuals. Well and good, but my

fear is that what if you have five hundred (500) individuals but because they concentrate in a small area and five hundred (500) individuals, two (2) males and four hundred ninety-eight(498) females? We are nearing that in breeding depression. So it's going to that sort of extinction threshold, one.

Second fear is that if we have another Haiyan that crosses Mindoro, gone is our national patrimony because they are concentrated in one small patch in the uplands of the hinterlands of Mindoro. One Haiyan type of typhoon, they're goners. So to me, that is a moral and ethical responsibility of the Filipino people. We should be contributing to the world biodiversity.

ATTY. PAUDAC:

Thank you, Dr. Mallari. You mentioned earlier about the double-whammy effect of deforestation and climate change, you in fact stated that "climate change accelerates biodiversity loss." I'd like to know, Sir, if we are able to put numbers, so we can quantify. At what speed or rate or what percentage is the acceleration, if you know?

DR. MALLARI:

Well, at the moment we do not have that analysis but one thing we know that quite a number or, in fact, let me step back a bit. Ninety percent (90%) of all threatened species in the Philippines are forest-dependent. The problem is, the deforestation is happening at a very rapid rate. In fact, you have an average of maybe one thousand (1,000) to two thousand (2,000) severe cases, five thousand (5,000) hectares per year. If that happens, you are looking at maybe an increase in maybe half a degree. And our global threshold is two degrees. And so, we are nearing that thresholds, I think. So I can't answer in terms of how many species but in terms of proportion, majority of the species would be the first ones to go. And all of them, in the slides, are endemics. They are only found in the small islands of the Philippines. The bleeding hearts are good examples.

ATTY. PAUDAC:

Dr. Mallari, you also mentioned in your Statement that the unique biodiversity that we have are, therefore, becoming particularly vulnerable to the deleterious effects of climate change. I'd like to understand how can we really separate effects of climate change from other factors based on your studies and twenty-five 25 years of professional experience in the environment and conservation.

DR. MALLARI:

This event or this phenomenon happens in two stages. The first is you destroy the habitat. When the habitat is gone, your house is obliterated, then you're exposed to the elements. The fact is the Philippines has gone hotter in recent years than in recent memory, at least, I think at this point it should be really raining hard. But you know, it comes and go. So what I'm trying to say is that this impact is the first stage of habitat degradation, and happening really fast. And when the house is gone, what kicks in are the abiotic elements. Meaning the non-living elements. Meaning they are exposed to the elements: sun, rain, temperature, humidity. And as you know, temperature is lower in areas where you have vegetations. It's hotter when you don't have vegetations. It's hotter still in urban areas where you have that albedo effect.

So when the species are exposed, then they become really, really vulnerable to, say extreme weather events. And in many cases, yesterday I just came back from the two ground zeros, Ormoc and Tacloban, I was aghast to see how vegetation forests changed in just six years. And when I was giving this similar presentation to our colleagues at the DENR, one of them stood up and said, "You're only showing deforestation. Can you change the narrative because we planted trees." And I said, "My friends, I am not here to judge, I'm just showing our analysis based on pictures taken from space, from satellite images. And our data is showing that deforestation rate in Leyte is, you know, to the tune of two thousand(2,000) hectares per year in the sixteen(16) years, and you still question if we are more vulnerable to climate change? Yolanda happened and it's not fake news. Or the great disaster in Ormoc in the 1990s happened because of flash flood. In areas, in what used to be forest, big flash floods. And when we recounted how many were the casualties, Yolanda had about six thousand (6,000) to seven thousand (7,000), is that correct? Ormoc had eight thousand (8,000) to nine thousand (9,000). So the cycle of disasters then was about ten (10) to fifteen (15) years."

So that seems okay. But now, it's happening every five (5) years and more frequent year on year. I am really passionate about this issue because my safety and the safety of my children is on the line. And, you know, we use only biodiversity as the barometer. At the moment, I feel unsafe because two weeks ago, I was chatting with a friend and we were monitoring the rainfall and my friend from U.P. said we're nearing Ondoy levels. We are comfortable with our rooms and we're happy. But the more vulnerable sectors to the ill effects of climate change are not us. It's other people who are living in high elevation and, of course, those who are driven from their ancestral land and retreated to the forest. And this has also the biodiversity of that retreat from lowlands, and like guerillas to the high elevation.

I think this is a long-winded answer, I apologize. But really, it's inseparable I think. But these two stages to me are crucial. I can't separate them. I mean in

medical terms, it's a syndrome. You can't isolate one from the other. And one is the effect of the other, if you see what I mean.

ATTY. PAUDAC:

Thank you, Dr. Mallari. Just last question, I understand that you've been around the country for more than twenty-five (25) years studying this environmental biodiversity. Are there any specific areas other than Mindoro, Palawan, that you've already pointed out earlier. I'm more interested as to areas where loss of biodiversity could be correlated to climate change or even if it is a syndrome as you've mentioned earlier.

DR. MALLARI:

My latest prediction, the reason why I showed you the bleeding hearts and the hornbills, they'll be the first to go. Despite the rapid degradation of forest in the Philippines, we have not had a single extinction. But I think we're getting there. I think that's…

ATTY. PAUDAC:

Areas in the Philippines?

DR. MALLARI:

All the small islands would go first. Incidentally, they're the most vulnerable to climate change as well, weather patterns and so on, those in the highways of typhoon, from North to Sierra Madre. If we decimate the forest, we will lose the toll gate of typhoons. The Pacific is the factory of typhoons. Toll gate would be the Sierra Madres and the Cordilleras. When the typhoons hit the land with forest, its strength is decimated. So the typhoon is weakened.

And if it's southwest monsoon, oh, it's going back, I'm referring to northeast monsoon, sorry... What I'm saying is that most of the small islands, Negros, Panay, compared to Luzon and Mindanao, Tawi Tawi and the list goes on, you know Sibuyan Island. You know, centers of endemism, they are the first to go.

First, the people would go because of flooding. The second, our barometers of biodiversity, will be gone. *And kawawa naman tayo.* (And that's unfortunate for us.) That's all.

ATTY. PAUDAC:

Thank you, Dr. Mallari. That's all for the witness, Your Honors.

PANEL CHAIR CADIZ:

Thank you very much, Commissioner Leah Armamento.

COMM. TANODRA-ARMAMENTO:

With the permission of the Chair, Mr. Mallari, may I ask if based on your scientific study what is the major cause of the destruction of the habitat of our indigenous species? Is it the climate change or the direct action of the people in the community?

DR. MALLARI:

It's the direct action. It's the direct persecution of the forests and the habitats.

COMM. ARMAMENTO:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Gwen Pimentel-Gana?

COMM. PIMENTEL-GANA:

Thank you, following up on what Comm. Armamento was saying, are you saying then that climate change in the Philippines is actually primarily caused by deforestation?

DR. MALLARI:

Well, it is a contributory factor. The global estimate is that deforestation contributes about twenty-four percent (24%) of the greenhouse gas.

COMM. PIMENTEL-GANA:

Yes, but primarily in the Philippines, would you consider deforestation as the primary cause?

DR. MALLARI:

No. In fact, we are not a net emitter of carbon but a carbon sink because we still have forests. We sequester carbon.

COMM. PIMENTEL-GANA:

Okay. So what do you think is actually affecting all this change in the weather and what we're experiencing now especially in terms of the preservation of our species?

DR. MALLARI:

The thing with climate change and Mother Nature is it doesn't recognize territories. Typhoons are produced. As I've said, the factory of typhoons is the Pacific. When the planet becomes really, really hot, hot air rises really fast so typhoons are created. When typhoons move, they move towards the Philippines and that's the pathway. And so, yeah, we bear the brunt of the effects of climate change, but the cause of climate change globally is not us really. We are, I hate to say this, but we are the victims here, I think.

COMM. PIMENTEL-GANA:

But you were saying and you were actually talking of species that are endemic to our country and that are really fast becoming extinct and one of the reasons that you gave was the reduction of the forest cover. So that was primarily what you presented. And what is the cause of the reduction of forest cover? Is it man-made, as Comm. Leah was saying earlier, or are there other factors whether the weather contributed to it? But what primarily is the cause of the reduction of our forest cover?

DR. MALLARI:

It's anthropogenic *po*. It's caused by humans.

COMM. PIMENTEL-GANA:

Ah, okay. So what you are saying is that for the Philippines, our biggest factor for such a reduction of the forest cover is man-made?

DR. MALLARI:

Yes.

COMM. PIMENTEL-GANA:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Karen Dumpit?

COMM. GOMEZ-DUMPIT:

I just have a question with the slide about what human activities generate greenhouse gases. So if we were to have percentages in the last column, which is land use sources, deforestation and burning of forest, conversion of wetlands, rice paddies, livestock production and fertilizer use, burning of bio mass. Can you give us percentages?

DR. MALLARI:

That's very difficult to answer now, Ma'am, because we've not done the nationally determined targets and accounting, we are still in the state of confusion as of the moment. Sorry.

COMM. GOMEZ-DUMPIT:

You mentioned that the causes of deforestation are anthropogenic. What specific human activities cause deforestation? I just want to clarify.

DR. MALLARI:

Well, Father Walpole is the best person to answer the question, but there are also stages. In the seventies, it's just boom in logging. We are, number one, top three exporter of timber, gold, copper, and silver. So we've been pillaging this country for the last number of decades. So deforestation is mainly caused by that. Another contributing factor, the big logging companies have gone upland farming and a lot of our *katutubos* (indigenous peoples) have no place, their farmlands, traditional farmlands have been taken by lowlanders or the educated people. They resort to moving to the mountains. So it's a vicious cycle really. It's hard to pinpoint, Ma'am.

COMM. GOMEZ-DUMPIT:

And as a result obviously of deforestation, we are more vulnerable to climate, extreme weather conditions.

DR. MALLARI:

Yes.

COMM. GOMEZ-DUMPIT:

Thank you.

PANEL CHAIR CADIZ:

Chairman Gascon?

CHAIR GASCON:

First of all, Dr. Mallari, thank you very much for the very important information you shared with us on the impact of deforestation, in particular, but climate change, in general, too, to biodiversity and for showing us the very beautiful pictures of our different species. I like the bleeding hearts very much.

DR. MALLARI:

Me, too.

CHAIR GASCON:

This Inquiry is framed by our petitioners about showing the link between both the activities but also the failure to inform by the Carbon Majors to the population about the negative impacts of climate change. So you mentioned that deforestation is a result of localized human activity – meaning, the ones causing the deforestation here in this country are not Carbon Majors but Filipinos themselves.

So that contributes to climate change. I'm trying to understand now because this Inquiry is about the link between that activity and impact on human rights. Is there any failure on the part of those that have the responsibility to inform: government, global polluters, etc. to this phenomenon of deforestation. Like, if we had moved sooner, for example, rather than later to renewable forms of energy, would that have halted or, at least, delayed the extent of deforestation because I am wondering maybe part of the deforestation is not just housing or economy but also fuel. So I'm wondering, could activities that should have begun much earlier in terms of mediating the impact of climate change be linked to that failure or responsibility to inform?

DR. MALLARI:

I think, Your Honor, if we've done our job earlier then we would be less vulnerable than what we are now. I think that is a sort of a logical answer to that. As I said, there is no boundary to the impacts of climate change. That fossil fuel burned all across the globe result to overall global rise in temperature and the impacts of the global rise in temperature, you know, our weather systems have gone haywire. So we can't predict when it's gonna happen. But the IPCC recently said, in general, those who are in the equatorial belt would feel the biggest brunt of the payback of climate change. And so again I can't isolate.

What I can say is that if we have done our jobs earlier on, we will be less vulnerable. Case in point, the reason why I forget the name of the super typhoon that was poised to ravage the Philippines about three (3) years ago, when it hit the Philippines, it weakened, you know, what do they say, in Yolanda, people were saying that areas where there was mangrove, devastation was less. So there are evidences out there that show that a more intact ecosystem reduces our vulnerabilities. I think this discourse is all about, are we vulnerable? The answer is yes. What is our measure? To me, the indicator, the barometer is biodiversity because we have lots of species that are at the brink of extinction.

It means that their habitats and ecosystems which they represent are in dire strait, if you like. So that is the case. So if we stopped the massive

deforestation in the seventies, and if we prevented the parity rights on the access to forest then we would have had, maybe I hope, more than half of the forest that we had. But you know, Negros was deforested almost completely shortly after the Spaniards came. Forests were converted to sugar haciendas. Cebu, the same. But their vulnerability increased dramatically. Water is very scarce. Cebu is one clear example.

Mindoro where I just came back, I think that was two or three weeks ago. In places where we were doing the surveys almost a decade ago, we almost did not make it back to Manila because most of Sablayan was flooded. And so, how do you put a value to it? How do you pinpoint the impact? It's really difficult. The only evidence that we have now are ones that we can monitor or we have monitored over quite a sizable timescale, ten (10), twenty (20) years. But we as a people and government were always slow to react. *Nangyari na bago tayo magreact*. (Disasters happen before we react.) Ondoy, you know, we were doomsayers ten (10) years before Ondoy, shortly after Ormoc tragedy. And they were saying, "Ah, doomsayers!" and Ondoy happened and it changed our behavior. But it was short term. After three (3) years, *okay na, naka*-recover *na* (it's okay as people have recovered). Back to normal, business as usual. And then Frank happened, and then Milenyo happened, and then Yolanda, and so on and so forth. We are like Dory in "Finding Nemo." We forget the moment we go into our houses and coop up. And especially in this day and age, you know, when living is highly driven by politics, we forget how vulnerable we are as a people.

CHAIR GASCON:

Thank you. You showed some slides which I find very interesting. You showed the slide, the graph of pre-Ondoy and post-Ondoy human activity. And you showed very clearly that the downward trend while it continued was in a sense abated. At one point, it was, sort of like plateaued. So even though there is an increase of the population, people have become much more aware about the need to protect the forest.

DR. MALLARI:

Yeah.

CHAIR GASCON:

I assume that we passed the threshold a long time ago. You said that the cover now is less than twenty percent (20%). But if there is a concerted effort in trying to mitigate, you talked to your friends in DENR saying, "How come

you are focusing on the deforestation but not on the planting of trees? What kind of effort will be necessary for us to turn the tide, if that is still possible? Is there a link between that kind of an effort of protecting our forest and biodiversity that would hopefully be enriched or restored by the restoration of forest on one hand and, let's say, more environmentally friendly human activity moving from fossil fuels to, let's say, more renewable forms of energy, moving from oil to wind and sun, for example? Is there a link between that or are those two (2) separate mediation efforts?

DR. MALLARI:

I'd like to answer that by saying this. In the experience of the Upper Marikina Watershed, with the concerted efforts of private sectors, NGOs, etc., the rate of decline has slowed down. But when we did the biodiversity scan and assessment, biodiversity did not spring back because as I said, in nature there is a time lag between springing back to homeostasis or the natural state to hanging on to your life sort of stage. What would be the way forward is that as a country, as a nation, we need to stop the bleeding now. With the less than twenty percent (20%) forest cover, let's stop further degradation, as we increase the forest size. But, of course, planting, and expecting that in five (5) years, we create a forest, that's ridiculous. We need ecological times. Maybe one (1) lifetime to recreate a forest. And so, you know, we are in that sort of situation where I think the song goes like "we found love in a hopeless place."

CHAIR GASCON:

That's a dance song.

DR. MALLARI:

Yes, that's my jam. My generation. But really, the problem is we were in this situation now. The third sort of strategy I think is to increase our resilience. Increasing our resilience is not just about cementing more rivers. It's more about fortifying rivers, and, you know, not planting and not cementing riprap something like that. It's not about planting the dipterocarp species first off. It is assisted natural regeneration. Look at what Upper Marikina Watershed, several months, few months after Ondoy. Busloads upon busloads of staff of Jollibee, Smart, PLDT, etc. went up there to plant trees. Thousands and thousands of plants, trees, planted. A few months after, we monitored eighty percent (80%) of them, gone. *Natunaw lahat*. (Everything melted.) Because there's a mismatch between the species and land. And you know, sorry to use this analogy, the Philippines is sort of a person who is suffering from diabetes. And then, it's losing hair, sorry. And that person's quite vain, and want hair

transplanted. You can't transplant hair until you cure or address your diabetes because the wound won't heal. So let the land heal first, before you plant. This is what happened in the Marikina Watershed. Because of the flooding runoff, organic material has been washed off. So *kahit ikaw yung seeds, kahit ikaw yung seedling* (even if your were the seed or seedling), you would die because it's too hot. Water is not retained. And most of the Philippines, *halos semento na* (most are cemented already). There's no absorptive capacity of the soil. It's a vicious cycle. It's a syndrome. *Ang hirap tanggalin ng bawat isang threat.* (It's difficult to remove every single threat).

CHAIR GASCON:

Interconnected.

DR. MALLARI:

Yeah, it is.

CHAIR GASCON:

Thank you, Dr. Mallari.

PANEL CHAIR CADIZ:

Fr. Walpole?

DR. WALPOLE:

No questions.

PANEL CHAIR CADIZ:

I have no further questions.

What is the pleasure of the counsels? Do you want to proceed to lunch already, or do you want to present your next witness?

ATTY. PAUDAC:

Let's have lunch, Your Honors.

PANEL CHAIR CADIZ:

So we will now have an hour break for lunch.

[Bangs gavel]

[Break]

CLERK OF THE INQUIRY:

All rise. The Honorable Inquiry Panel Chairman Comm. Roberto Eugenio T. Cadiz still presiding. Everyone may now be seated.

PANEL CHAIR CADIZ:

[Bangs gavel]

The panel is now in session. Counsels, you may now present your next witness.

ATTY. MAYO-ANDA:

Good afternoon, Your Honors. Our next witness is Dr. Jonathan Moses Jadloc.

PANEL CHAIR CADIZ:

Please swear in the witness.

DR. JONATHAN MOSES C. JADLOC:

I am a Filipino, and I am from Tacloban City.

ATTY. MAYO-ANDA:

Your Honor, may we proceed?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Our witness, Dr. Jonathan Moses Jadloc, is currently the President and Chief Executive Officer of Havilah Polymedics which is situated in Sogod, Southern Leyte. He's also the Vice President and Medical Director of Allied Care Experts Medical Center in Tacloban City. He's also the National Chair of the Climate Change Committee of the Philippine College of Physicians and the Foundation of the PCP. We are offering him as a resource person to discuss with us the impact of the climate crisis in the internal human body and expound on the pathophysiology of heat stress, air pollution effects and the Zika virus. And before I proceed, Your Honors, may I request the witness to identify certain documents?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Good afternoon Dr. Jonathan.

DR. JADLOC:

Good afternoon, Attorney.

ATTY. MAYO-ANDA:

I would like you to take a look at these three (3) documents. That's the first document consisting of two (2) pages refers to a curriculum vitae.

DR. JADLOC:

This is my curriculum vitae.

ATTY. MAYO-ANDA:

And do you confirm and affirm the contents of this document?

DR. JADLOC:

I affirm and confirm.

ATTY. MAYO-ANDA:

Now this document, Your Honors, has been pre-marked as "XXXXX"" until ""XXXXX-2". The next document is a "Statement of Dr. Jonathan Moses C. Jadloc," consisting of six (6) pages. Kindly take a look at this document.

DR. JADLOC:

This is correct. I made this.

ATTY. MAYO-ANDA:

Now in the last page of this document, Dr. Jonathan, is a signature. Do you recognize the signature in this last page?

DR. JADLOC:

This is my e-signature.

ATTY. MAYO-ANDA:

We also like to manifest that he already signed the Statement, Your Honors, in the original copy which is with the Commission and this document has been pre-marked as "WWWWW" until "WWWWW-5," and the signature as "WWWWW-5-A." And the last document, Dr. Jonathan, refers to a PowerPoint presentation consisting of thirteen (13) pages, "The

Consequential Demise of the Human Body in the Climate Crisis." Please take a look at it.

DR. JADLOC:

I made this PowerPoint.

ATTY. MAYO-ANDA:

So do you confirm the contents of these documents?

DR. JADLOC:

I confirm.

ATTY. MAYO-ANDA:

Do you also confirm and affirm that these three (3) documents were submitted to the Commission on Human Rights.

DR. JADLOC:

I confirm and affirm.

PANEL CHAIR CADIZ:

Before you proceed, Atty. Mayo-Anda, there seems to be a discrepancy between your exhibit now that you manifested as XXXXX. There's a discrepancy between that and the record that I have. May I hear our Clerk of the Panel, just to clarify for purposes of marking, and can you speak on the microphone for the record?

CLERK OF THE INQUIRY PANEL:

Yes, Your Honor, for the record, the Exhibit submitted before the Commission consists of three (3) pages.

ATTY. MAYO-ANDA:

Yes.

CLERK OF THE INQUIRY PANEL:

So for clarification it's three (3) pages, Exhibit "XXXXX" to "XXXXX-2."

ATTY. MAYO-ANDA:

Yes, yes. Correct, Your Honor. Just to reiterate, the Curriculum Vitae marked as "XXXXX" until "XXXXX-2" consisting of three (3) pages.

PANEL CHAIR CADIZ:

Four?

ATTY. MAYO-ANDA:

Three (3), three (3) pages.

PANEL CHAIR CADIZ:

Three pages? We do not have a copy of the XXXXX exhibit here with our files. *Meron ba?* (Do we have?)

COMM. KAREN S. GOMEZ-DUMPIT:

Meron ako. Ayan. (I have. There.)

PANEL CHAIR CADIZ:

Alright. Sorry, sorry, it's here.

ATTY. MAYO-ANDA:

Can we proceed now?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. MAYO-ANDA:

Dr. Jadloc, you can proceed with your presentation.

DR. JADLOC:

A pleasant afternoon. My respect to the highly esteemed Commissioners, ma'am and sirs, to the guests and organizers for this afternoon's event. I came today as a clinician and as an independent climate health advocate. The points and information that I'm going to share this afternoon came from my readings, scientific researches, personal training, and experience; and it does not represent the organization of the Philippine College of Physicians where I hold the position as the Chair of the Advocacy Committee on Climate Change. As a practicing clinician, I strongly concur with the findings of the IPCC, which stated that human influence on the climate system is clear: the fossil fuels burning, deforestation, agriculture and food production, and, of course, power plant emissions all release carbon dioxide and other greenhouse gases into the atmosphere, trapping heat causing global warming which changes the climate system subsequently. The Lancet, one of the two (2) leading international medical journals with the New England Journal of Medicine, declared two (2) years ago that climate change is a medical emergency, as stated by Professor Montgomery.
As clinicians all over the world, we practice with excellence, at the same time with mobility and with utmost prudence, to treat, to preserve, and to extend lives. We aim to look into and address varied threats to health especially those that result in catastrophic outcomes, and this is, I'm talking about mortality. So these threats can be familial, it could be habitual, it could be consequential, but my purpose for this afternoon is to expound, that there's a threat called environmental. And I would like to go into the pathophysiology of these facets and its impacts to the health of human beings.

So I'll be using a lot of medical terms but I'll try to make it simple. One important term is pathophysiology, a medical term which means it's a disordered normal process of the human body caused by a disease or a stressor. Now, there are global systems that are truly vulnerable to climate. Let's talk about the global systems. Let's talk about this, it could be water, it could be food supply, it could be global health, but my emphasis for this afternoon is actually on global health. Now, how does climate change affect health? I'm going to show you a diagram of all the facets that actually

influence health, which is found in the environment. It could be extreme weather events, infectious disease, water, mental health, allergens, heat stress, air pollution, and food. But in the interest of time, I am just going to emphasize three (3.) That will be air pollution, heat stress, and infectious diseases. We won't spend a lot of time on all this, but it is important to emphasize, because most patients will connect more with the health impacts than practically any other facets of this issue. And it is important on its own. I will discuss the effects of heat stress from global warming, air pollution impacts, and emergence of infectious diseases specifically Chikungunya, Zika virus, and a little of dengue.

Let's talk about the epidemiology of extreme heat events. In the United States, it's actually the single biggest health impact causing more death with all others combined. Just in the United States, there was recorded seven thousand four hundred (7,400) deaths from heat waves from 1990 to 2010, and thirteen thousand seven hundred (13,700) deaths in France and the rest of Europe in 2003. There were also around one thousand two hundred (1,200) deaths in Karachi Pakistan in 2015, in a single day when their temperatures hit fifty-one degrees (51^0) Celsius. In Iran, in 2015, specifically in the City of Basra, it hit seventy-one (71^0) degrees Celsius, and, of course, it was unlivable during that time. Now, we talk about Philippines. We have the record of forty-two degrees (42^0) Celsius heat and fifty (50) to fifty-one degrees (51^0) Celsius heat index last April 13, 2016 in Tuguegarao as well as in Butuan. While Filipinos are actually acclimatized to this kind of temperature, our problem more in the country is on drought and the destruction of crops, droughts like in Bohol, in Saranggani, in 2016 and other parts of the country.

So who are vulnerable to this heat stress? These are actually the poor, the elderly, the infants and children, those with pre-existing medical conditions. And when I say pre-existing medical conditions, these are patients with cardiac morbidity and respiratory conditions and also people who cannot thrive by themselves, who are dependent on others–those who were actually mentally ill. So sixteen (16) of the seventeen (17) hottest years in modern times, experienced from year 2000 up to present. And the question now is this, what really happens to the body when we are exposed to extreme heat? Now, God designed our body so that it can regulate itself. It's called thermoregulation. However, when this external or internal heat load is not prevented or the person is constantly exposed to heat, it is perceived as a stress, we call it heat stress. And when you are in an environment when there is heat stress, your body will actually adjust. First, your heat defenses will be activated. We all have that, God has given us that. So these are cool-seeking behavior. *Pupunta ka sa*refrigerator*, iinom ka ng tubig, o kaya iinom ka ng* softdrinks. (You go to the refrigerator, drink water or drink soda.) Second, you will have cutaneous vasodilation. *Magda*-dilate *yung* vessels *mo* (your vessels will dilate), so it will cool by itself. And of course, the third is evaporation–you will sweat and, of course, by evaporation you will cool

yourself. But take note, these are all self-limited. Now, if your thermoregulatory capacity is intact, it will give you actually heat acclimation. So why can other people tolerate hot weathers?) Because they are acclimatized, because of your activated heat effectors. And so, with heat acclimation, you can actually tolerate heat. That's why *iba-iba ang laro natin* (we have different reaction) as far as exposure, as far as threshold is concerned.

The question now is, what will happen to the person who is not acclimatized? And he is constantly exposed to heat stress? Definitely the cutaneous vasodilation will continue. Now, when you say vasodilation, your vessels will actually dilate, will open beyond normal. And if it keeps on opening beyond normal, *babagsak ang circulation mo* (your circulation will drop). There's what we call a venous circulation. *Bababa ang dugo sa paa.* (The blood will move towards the feet), it's called the arterial circulation. If it moves towards your head, that's already venous circulation. So *kung palaging* vasodilated *ang* blood vessels *mo, pagtaas nyan, bababa ang pressure.* (So if your blood vessels are always dilated, when the blood moves up, the pressure will decrease.) So it's called the decrease venous return.

This decreased venous return will be detected by your heart as hypovolemia. *Bumaba yung* volume *ng dugo mo.* (Your blood's volume decreases.) So what will come now as a response is there will be in an increased demand for cardiac output. So *bibilisan ng* heart, *pag-increase ng* (The heart's pumping will increase your) cardiac output because it detected that you have hypovolemia. Now the problem here is, if the person has a heart disease, he cannot increase his cardiac output because there is a disease. And when he is constantly exposed to this kind of environment *hindi magsu*-surrender *ang* heart *mo* (your heart will not surrender); it will continually pump until such a time that he will decompensate. Well, of course, that is needed because there is a needed cardiac output redistribution; but if there is heart disease eventually that will cause heart failure, and when there is heart failure there will be circulatory shock, and the next to that is head decompensation, and the last is actually death.

So that's how cardiovascular disease ends up to death with heat stress. Now, that's not all. With constant evaporation, there will be insufficient brain perfusion, *dahil bumaba yung* volume *mo* (because your blood volume decreased). So *ito po yung rason bakit bumabagsak iyong mga pasyente, iyong mga tao na mga* athletes *kasi nagkakaroon ka ng* (This is the reason why patients and even athletes faint, because they are having) insufficient brain perfusion. *Nagkakaroon ka ng* (You are having) what we call heat syncope, okay, *at hinihimatay* (you lose consciousness). Now if still there is constant exposure to heat stress, there will be salt and water loss from your skin, from the sweat, and so there will be an electrolyte imbalance. *At ang mangyayari nyan, magkakaroon ka ng* (Then you will have) heat cramps. So

that's the reason for having heat cramps during heat stress. Now if you will be continually exposed to further heat stress, it will cost more dehydration, more water loss, and more hyponatremia, *babagsak yung asin* (decreased sodium), that's why you will have a sensation called heat exhaustion. Again, *mahihimatay ka na naman* (you'll lose consciousness) and most especially, when that exposure to extreme heat will not be prevented, you will have a progressive hyperthermia.

And when the temperature reaches forty-one degrees (41^0), eventually the patient or the person will have what we call heatstroke. And when there is a heatstroke, neurological consequences will now ensue. And when there are neurological consequences, there will be a cascade of catastrophes in your body. It will be perceived as an emergency. There will be systemic inflammation of all vessels in your body, there will be a drop in blood pressure eventually you will have multiple organ dysfunction, disseminated intravascular coagulation or bleeding, further, there will be electrolyte imbalance, pH imbalance, osmotic imbalance because of the decrease in sodium, and further result in death.

So that's how heat stress cause all these mechanisms and how it is connected to mortality and this happens everywhere especially in places where there are heat waves and constant exposure to heat stress. Now, that is all about heat stress.

Let's talk about another cause of human demise from climate change and we were talking about air pollution. Worldwide, air pollution kills six point five (6.5) million people every year. Whether it's seven (7) or six point five (6.5), that's a lot. Now, at the other side of the spectrum, this is common especially in cities. To put it simply, climate change is stacking the deck against a healthy human population. So not only by air pollution, also vector borne diseases, also waterborne diseases, but if we talk about mortality maybe we are not so aware that six point five (6.5) million people die each year because of air pollution. Many of them aren't even aware that it is from the environment that actually triggered or caused their deaths. Now I know we've been talking about the concepts of climate change and global warming. I'll not dwell on that anymore but I would just touch on this source called carbon monoxide because it has a bearing on the pathophysiology again of the body. So of course, it's from incomplete combustion of fossil fuels and according to the EPA in the United States, the atmospheric carbon dioxide level as of today, I checked it now, is already four hundred six point fifty-three (406.53) parts per million and scientists and health advocates agree that the livable air is only three hundred fifty (350) parts per million. Now, why did I emphasize carbon monoxide? Because carbon monoxide exposure have health effects.

If you are familiar with your red blood cell, it contains hemoglobin, a protein. Now this is the oxygen carrying capacity of your blood. It's so significant

because it carries the oxygen all over the body. Now when you're constantly exposed to carbon monoxide, it reduces the oxygen carrying capacity of your blood and those at higher risk are children with anemia, heart disease and chronic lung disease, and of course fetuses. When you are constantly exposed, with reduced oxygen carrying capacity, your organs will actually have a manifestation called hypoxia or ischemia and after a long time, of course, it will compensate. But, after some time, it will decompensate and eventually will lead into an organ failure.

Let me give you this summary of other major pollutants. At least five (5): particulate matter, ozone, nitrogen dioxide, carbon monoxide, and sulfur dioxide. Now, on the first four (4), they all come from fossil fuels burning. Whether it's particulate matter, whether it's ozone, nitrogen oxide, carbon monoxide; but the sulfur dioxide, it comes from industry sites such as smelters, paper mills, cement, power plants, and some from manufacturing plants as the main sources. But the first four (4) come from mainly fossil fuels burning, which we actually use every day. Now, those are tiny funds,but I would like to emphasize on the health effects of the four and then the fifth. All of them cause significant respiratory mortality and morbidity. There's illness, and eventually death.

But I would like to point out a specific disease, I want to highlight what is actually causing a loss or lack of productivity for patients who have this. So those five (5) pollutants cause significant exacerbations of bronchial asthma. We call it bronchial asthma in acute exacerbation whether it is particulate matter, ozone, nitrogen dioxide. All of these, if you're going to look at the small funds, all of them will trigger allergies as well as significant exacerbations of bronchial asthma and subsequent emergency room visits. And if this is not treated, if this becomes fatal, it will also lead to death.

Of course not just bronchial asthma, there is COPD. And of course there is lung cancer. But I would like to emphasize this afternoon on asthma because of time constraints. Before going to the pathophysiology of asthma, I would like to also mention that because of significant longer months of dry season, because of drought, allergies will be much worse by 2040. Now, not everyone is affected by this, but if you are an atopic person and every day you have allergic rhinitis that's something, no? Talking about your productivity, and if you're a member of a family who's affected by urticarias, affected by asthma or allergy, it's really very important. Now the projected increase is predicted from eight thousand five hundred (8,500) grains of pollen per cubic millimeter on year 2002 to more than twenty thousand (20,000) or twenty-one thousand seven hundred thirty-five (21,735) by 2040. That's three hundred (300) times more if we will continue to have this dry season, these are long seasons of heat, and, of course, considering the fact that these are found everywhere, all these allergens are found everywhere.

So let's stop and look at this diagram. That's your lung. Of course, we have a left lung, we have a right lung. *Dito, di siya nakikita.* (Here, it's not visible.) Now, the red arrow is actually the inhaled air, okay? It goes inside your trachea, it goes to your bronchus, it goes to the bronchial tree. *Paliit nang paliit tapos* (Getting smaller and smaller and then) it's like a tree, okay? From the branch, it will go out to a smaller branch, and further to the smallest branch. Now, if you're going to look at the center, where you can see actually a crosscut section where these are red and blue arrow, it's actually an airway. *Lahat tayo mayroon niyan.* (We all have that.) So the red arrow is the inspired air that goes inside, and the blue arrow is the expired air that goes outside. In that diagram, there is no problem, okay? *Makahihinga ka ng maganda* (You can breathe well), or easily, *makatutulog ka* (you can sleep). But if you are constantly exposed to these pollutants, to these allergens or to any inciting factors that may cause the exacerbations of asthma, what will happen is this next picture.

Let's take a look at the lumen inside. If you are going to compare the lumen to the other side, *masyado na siyang maliit* (it's already too small). It's a small lumen caliber or diameter over the right. Why? Because the smooth muscle surrounding it is actually inflamed and it has swollen. What caused the swelling? What caused the inflammation? It's actually the pollutants and the chronic or acute exposure to these pollutants anywhere. So that is a classic histological picture of asthma. Now if you have that airway in you during the time, you cannot breathe well; and when that air goes inside into a narrow lumen, it will create a sound. It's called wheeze and I know you have heard of wheeze. *(Imitates wheezing sound.)*

Okay? That's a sound of an air passing through an obstructed lumen or a small lumen caused by the allergen or a reaction. Now, this is fatal. This is reversible but this is fatal. If you are not able to intervene at the proper time, all of this airway will actually close and of course cause death. We cannot deny a lot of people already died from asthma. Especially if you don't have access to medications, to nebulizers, to epinephrine. Well, lucky for you if you are just close to some people who can give interventions. But all those pollutants that I have mentioned, whether they come from plants, whether they come from fossil fuels burning, they all exacerbate this condition and once they are not properly intervened they will actually cause death. Again, not only asthma it will also cause COPD, emphysema, bronchitis, and of course lung cancer but I don't have a time to discuss that this afternoon.

A while ago I already talked about heat stress, air pollution and asthma, and, of course, a little about lung cancer. My last subject would be about infectious disease. A lot of tropical diseases have been moving to higher latitudes, okay? And, of course, air transpiration is a major factor in this, but the climate crisis is changing the conditions on where these diseases can take root and become endemic. So climate change is disrupting the natural ecosystems in a way that

is making life better for infectious disease–that's a statement by Andrew Dobson. So you are going to take a look at this tropical diseases map in the whole world. Maybe before you haven't heard of Chikungunya. Before Yolanda I haven't encountered Chikungunya actually. I would only encounter dengue, I only encountered malaria, but later there's this Chikungunya, there's dengue fever and, of course, now the dreaded Zika virus. It's already there. And why is it, that there's an emergence and re-emergence of these tropical diseases nowadays? And this is related to what I've said a while ago transpiration of air, and, of course, moving of vectors to higher places, and, of course, migration.

In the West, mosquito season is growing. Before it was only eighty-one (81) days from 1980 to 1989. Now the breeding season (for) the mosquito is up to one hundred eleven (111) days from 2006 to 2015. Now, this is very significant. So talking about Zika, if you look at the picture, that mosquito is very familiar. You have that mosquito in your house, you have that mosquito in your schools. *Iyon po ang* stripes*na mga paa,* black and white*, at saka yung katawan niya* stripes *din.* (These are the ones with black and white striped body and extremities.) That is exactly *Aedes aegypti*, okay? That's the vector for dengue, that's the vector for Zika, and that's the vector for Chikungunya. Endemic *po saPilipinas* (in the Philippines). So how does climate change affect Zika? As temperature warms, the mosquitoes' range also expands, as more locations develop mosquito-friendly climate. *Di ba?* (Isn't it?) Especially *kung masyado tayong maulan, nagkakaroon ng mga tubig doon sa mga* plants*, doon sa mga* tires.(When we have more rainy days, water is collected in plants or tires)everywhere. There are more days when mosquitoes are active and able to reproduce. The mosquito's reproduction rate increases, so more generations are born each year. The mosquito's metabolism accelerates causing them to feed and bite more often, and most specifically, most importantly, the virus incubates more quickly in one temperature inside the mosquitoes, increasing the time available for transmission.

For us to better understand this, I will show you a very nice slide, care of Al Gore. Now this is the normal *Aedes aegypti* life cycle. For your information once an *Aedes aegypti* vector, the type of mosquito that you see, once it matures, it will only have a lifespan of sixteen (16) days at the most. There is no seventeen (17), eighteen (18), nineteen (19), none. *Pwede siyang mamatay ng* fourteen (14) *pwede siyang mamatay ng* sixteen (16) days. (It can die within 14 or 16 days). Now the normal life cycle here is from day zero to day three (3), it will change from egg to larva. And then from a larva it will become mature, the mosquito reaches maturity, and when it reaches maturity it has now the capability and the capacity to bite people who are actually harbingers or who have Zika virus. Then what will happen is that when it bites a person with Zika, there will be incubation of the virus inside the mosquito. Now once it is able to incubate inside the mosquito, once it matures, the vector, the *Aedes aegypti*, is now ready to infect another person.

However, it does not happen. Because in normal conditions, the time of maturity in the incubation of virus takes a long time and once it is already mature or fully incubated, *patay na yung lamok* (the mosquito is already dead). So *hindi sya nakaka*-bite (the mosquito cannot bite) that's exactly the explanation why there was no Zika virus epidemic before. But look at this. In warmer conditions, the first three (3) phases of the life cycle of Zika, of *Aedes aegypti* is actually shortened. *Nagiging mas mabilis* (It becomes faster), from eggs *derecho siya naging* (it develops straight into a) larvae. The Zika mosquito reaches maturity and ingests the Zika from another person and here is the clincher, the virus incubates much, much faster inside the mosquito. And so the virus is able to mature very fast and so it eventually has longer time to bite people before it dies. So faster life cycle, faster maturity, faster incubation of the virus, now it has the leisure to bite people. And once it bites people especially if pregnant women, then they will cause this catastrophe called microcephaly for their unborn child. That's why we have a problem with Zika because of warmer conditions.

On August 12, 2016, the United States declared the Zika outbreak in Puerto Rico as a public health emergency. During that time, in San Juan, Puerto Rico, a lot of pregnant women, up to fifty (50) pregnant women were actually infected by Zika virus. And in Puerto Rico, according to the Center for Disease Control, they are worried about it returning to Puerto Rico with all the chaotic conditions there now. I was able to talk with some relatives in the Caribbean and in the States. They say that if you want to be pregnant you should avoid going to the southeast of the United States, especially to the Caribbean because of this reason. Before, scientists were perplexed what was the effect of Zika on pregnant women. Of course, you have heard before that the microcephaly or small head of the children in Brazil came from contaminated drinking water. But actually it was proven that the cause of microcephaly among unborn babies was actually Zika. Now microcephaly is a clinical finding of a small head (micro is small, cephaly is head) compared with infants of the same sex and age or gestational age if measured at birth. Of course, it's a head circumference. This can be actually measured through ultrasound even prenatally and the child will have a neuro-developmental disorder and this is suffered for life. Now this can be detected again through imaging or at birth. Through January 2016, ten thousand four hundred forty-one (10,441) suspected and two thousand three hundred sixty-six (2,366) confirmed Zika virus associated infections have been reported in Brazil, and sadly up to this point they are still grasping for measures to control this epidemic and to control this scare among pregnant women in Brazil.

Second to the last slide. Now, why is there microcephaly with Zika virus infection? So what we know now is from the Center for Disease Control. If you take a look at that small brown thing there like a paddle, it's actually a neural progenitor cell (NPC). Now, that is an embryologic term that we have.

Now let's just say that NPC is the foundation of your brain. *Lalaki yan.* (That will grow bigger.) Your fully formed brain comes from the NPC. Without the neural progenitor cells and their neuronal network, *walang mangyayaring* brain (the brain will not form). Now, when there is a Zika virus infection, they are up there, together with placental insufficiency, low oxygen together with infection and inflammation. It will lead to some catastrophe which actually cause cell death, cell death of the neural progenitor cells and their neuronal progeny and this embryologic structures that serves as a foundation for your brain, for organ development, will actually manifest as retardation of the growth of the brain, thereby, producing what we call microcephaly. So that is as far as we know according to the Center for Disease Control. Of course, it took time for them to know that, but as far as science and medicine are concerned, this is the accepted theory. And so, it's a must that if you want to be pregnant you should be careful not to be exposed to the Zika virus.

So for my last slide, climate change also increases the risk of many waterborne infectious diseases, and this actually happens here in our country. Let's mention some–cholera, dysentery, hepatitis A, typhoid fever, *E. coli*, cryptosporidium, campylobacter, and, of course, I would like to highlight leptospirosis. Every now and then we have flooding. Anywhere in Marikina, in Quezon City, in Cavite, even in Tacloban and people are not so aware that they could have leptospirosis. Now leptospirosis comes from leptospires from rat urine and we all know that the rats are everywhere and anywhere. Now, if there is constant flooding, leptospires can join the water, it can survive in the flood, and once it's able to penetrate the skin of the individual it will cause a disease called leptospirosis. And there's a severe type of leptospirosis that once this is not treated, it will lead to a condition called kidney failure, and, eventually, it will lead to hemodialysis or peritoneal dialysis, and of course, sadly, death. Thank you very much.

ATTY. MAYO-ANDA:

Thank you. Your Honors, may we be allowed to ask questions?

PANEL CHAIR CADIZ:

Thank you, Dr. Jadloc, for such… enlightening presentation.

DR. JADLOC:

You're welcome.

ATTY. MAYO-ANDA:

I would like to know from you, Dr. Jadloc, if you're aware of studies in the last ten (10) years on public health emergencies arising from higher temperatures and other climate impacts in the Philippines?

DR. JADLOC:

It is not quite common in the past ten (10) years, but since the onset of Yolanda and with the participation of the many INGOs who came into the area like in Tacloban, each of them actually had their assessment, had their evaluations and most of them were actually conducting assessments from the damage and for the devastation. But as to the research documenting the impacts of climate change on health, I don't know yet of one that is going on or has been finished in Tacloban. But there is a very good study from the Asian Development Bank. It was published prior to Yolanda in 2011. It actually was done in three (3) countries–Nepal, Indonesia and the Philippines, entitled, "Accounting for Health Impacts of Climate Change," published in 2011.

Now when I browsed the study, I realized that in that effort they were trying to investigate the many approaches and the studies being conducted relevant to climate change and health. As an analysis from their studies, they said that implementing adaptation investments in the health sector is a significant component of an overall climate change strategy. But in that study, they were able to prove that most researches conducted and their approaches were done in a reactive manner. Meaning if there's an outbreak of cholera, if there's an outbreak of dengue, they will investigate whether this is climate change-related or related to global warming, and they identified the sectors which actually can be addressed in that kind of scenario, sectors like water, agriculture, and of course management of disasters. But they were able to have a conclusion that these approaches is not as effective if you are going to talk of long term, than doing researches that are preventive.

So there. Actually their recommendation is a climate change adaptation strategy that focuses on preventing the projected health impacts of climate change. It is likely to be more effective in the short, medium, and long term rather than a strategy that is reactive. Well, of course, it's not bad to react to certain situations especially during disasters. But if they're saying, if you want to make this component a significant strategy to address climate change especially in the human side, you have to do studies and researches that are focused more on the preventive side.

So I read more into that study and I'm so happy that in that study they gave us formulas on how to estimate the burden of diseases as well as costing. For example, in the next ten (10) years, how much are you going to spend to

prevent an outbreak of cholera? How much are you going to spend to prevent an outbreak of dengue? There is a formula like that and in that study, they actually gave a step-by-step process, eleven (11) steps, on how to come up with an approach on estimating the burden of disease specifically on the impact of climate change on humans. So that's the only study that I can share to you at this time, Ma'am.

ATTY. MAYO-ANDA:

Thank you, Dr. Jadloc. I would like to know further in relation to that study, that's Asian Development Bank?

DR. JADLOC:

Yeah, yeah. That's ADB.

ATTY. MAYO-ANDA:

Were there any specific recommendations identified that are specific to the Philippines?

DR. JADLOC:

Yeah, actually alongside with that, they were pushing for researches to be conducted into this issue and one thing that bothered me was for you to really understand the impact of climate change on health, it has to be with a specific designated time and it's not short-term. It could be five (5), ten (10) years, and even then, they said it could be twenty (20) years because we know climate change is not just weather related. Climate change and weather disturbance are not the same. So when we talk about impacts, we're talking of short term, medium and long term. So when we say long term study, it boils down to the funding. So of course, the more robust your study is, the more long-term it is, the more funding that you'd actually need, and I hope these organizations like ADB are willing. They put in the recommendations on how they can partner with organizations who are willing to do this. And, of course, you have to comply with their research's protocol and their funding protocols. It's there, in that study.

ATTY. MAYO-ANDA:

Thank you Dr. Jadloc. You mentioned of a Chikungunya observation after Yolanda because we gathered that you're working in Tacloban City.

DR. JADLOC:

Yes, yes, Ma'am.

ATTY. MAYO-ANDA:

Were there specific documented cases? Has there been any monitoring undertaken by DOH in that area on those specific cases?

DR. JADLOC:

Yeah. To set the record straight I was not in Tacloban when Typhoon Yolanda came or struck. I was in the United States. I was attending a convention in Atlanta, Georgia. I left Wednesday and Yolanda came Friday but my kids were there. We were watching CNN in Atlanta and we could see how Yolanda was battering Tacloban. It was so intense. Of course after the convention, we could go home to our kids but it was a moment also to reflect on how nature can actually pay us back. I arrived in Tacloban one (1) week after Yolanda. It was so hot, the roofing of my in-laws were taken out. Basically, we were sleeping while seeing the stars at night and whenever the rain would come, we would pack our things, go to the room because you know there was no roof.

But I would like to point out what I said a while ago, that in my twelve (12) years of practice, I haven't encountered Chikungunya even in Tacloban. But after Yolanda, in that span of three (3) months, all of my nephews and my nieces had Chikungunya infection, and even my wife had Chikungunya infection. And when you say that you had Chikungunya infection, this is actually a syndrome of fever, muscle pains, with normal platelet. That's how you clinically differentiate it from dengue. If you are encountering dengue, the platelet will go down, the hematocrit will go up; but in Chikungunya, there is almost no derangement of your blood profile. Now for my nephews and nieces there was no problem. After one (1) or two (2) weeks, they were able to resume their work. But for my wife she got the Chikungunya and the clinical syndrome for three (3) months. She is a surgeon, she is an obstetrician. And literally she was in pain when using her hands…almost unable to use her hands in surgeries because of the pain and arthritis brought about by Chikungunya and that really affected her productivity. And we even went to

St. Luke's from Tacloban just to make sure that she didn't get any connective tissue disease like lupus. I mean those are very technical diseases, and it then ended up that she just got Chikungunya.

But what my emphasis here is it can actually give you that morbidity and that discomfort and disruption of your productivity for three (3) months with that Chikungunya alone. And that we believe that this *aedes aegypti* vector came from the environment, which was brought about by Yolanda, and this is not exclusive to our family. Even my friends, majority of my friends who were in Tacloban, living in Palo, they actually experienced Chikungunya. It became (as common as) *pan de sal* (salted bread). It was ordinary for people to have Chikungunya after Yolanda.

ATTY. MAYO-ANDA:

Is Chikungunya still an ailment taking face in Tacloban?

DR. JADLOC:

Yeah… yeah… yeah.

ATTY. MAYO-ANDA:

Until now?

DR. JADLOC:

Until now. In fact, I checked a while ago, just to make sure. In the Department of Health, January to June 2018, this year, there has been an increase of cases by five percent (5%) compared to last year–2017. So it is an increasing trend, the Chikungunya. It never went away. And I also checked the statistics of dengue. It's actually a saddleback statistics; it's now endemic. Before, dengue was just in the rainy season, but now it's actually year round. If you want to check these statistics of DOH, just visit doh.gov.ph. You could see that there is actually saddleback trend and it's high now. It's high compared to last year. You can check the statistics of the DOH.

ATTY. MAYO-ANDA:

Thank you, Doc. I am just curious with that data. Is there any DOH report with an analysis of these cases, not only in Tacloban but also in other parts of the country, if you're aware?

DR. JADLOC:

Yeah, it's available in their website. You just click respiratory illness– Chikungunya, dengue and they will give you this information. It's actually in a bar graph and they give you this graph and it's very easy to understand. It's there. If you want to know the five (5) years statistics, or ten- (10-) year estimates, it's there.

ATTY. MAYO-ANDA:

Thank you, Dr. Jadloc. Your Honors, if the Commissioners would like to ask some questions.

PANEL CHAIR CADIZ:

Commissioner Karen Dumpit, do you have questions for the witness?

COMM. GOMEZ-DUMPIT:

Actually, I was going to look at the site of DOH but I was wondering, we were talking a while ago, that perhaps maybe we can also invite DOH to just also, be a resource person in this case. But I'd like to also thank Dr. Jadloc. I hope your wife is fine.

DR. JADLOC:

Yes, she's good Ma'am.

COMM. GOMEZ-DUMPIT:

And we're really interested in finding out the increase or decrease in incidence of diseases brought about by mosquitoes, the *aedes aegypti* and other diseases. And perhaps we can also trace the study that was conducted by ADB, that was 2011 right?

DR. JADLOC:

Correct. Correct, Comm..

COMM. GOMEZ-DUMPIT:

So *baka mayroon pang iba na*… There may have been other studies, similar studies that have been undertaken by not only ADB but perhaps the World Bank and other institutions that can take a look at the impact on health by climate change. Thank you.

PANEL CHAIR CADIZ:

Commissioner Gana?

COMM. PIMENTEL-GANA:

My curiosity was just picked with the slide that showed about the Zika virus, no? So you said that after three (3) days the mosquito… the egg…

PANEL CHAIR CADIZ:

The life cycle?

COMM. PIMENTEL-GANA:

Yeah, the life cycle. You said that because of climate change and all, the life cycle has actually become shorter but the cycle also of the disease of the infection being developed in the mosquito becomes faster?

DR. JADLOC:

The incubation?

COMM. PIMENTEL-GANA:

The incubation.

DR. JADLOC:

The incubation of the virus inside the mosquito will become fast.

COMM. PIMENTEL-GANA:

Yes.

DR. JADLOC:

And the first three (3) phases from egg, larvae, to mosquito was shortened.

COMM. PIMENTEL-GANA:

Yes. Now, I was just wondering, you said there that when the mosquito bites somebody that is infected by the Zika virus, but it doesn't on its own...

DR. JADLOC:

No… no.

COMM. PIMENTEL-GANA:

So you were saying that it becomes a vector?

DR. JADLOC:

Yes, Ma'am, it's just a vector.

COMM. PIMENTEL-GANA:

So it's just a vector. Yeah. Okay.

DR. JADLOC:

A vector has no virus by itself at birth.

COMM. PIMENTEL-GANA:

Yeah. So how does this Zika virus (rather) the human get infected by the Zika virus? Does it have something to do with the environment, or the climate, or what?

DR. JADLOC:

That's what they believe, Ma'am. They believe that humans are also harbingers of this virus and it's actually the vectors who are able to transmit this faster into our larger population now, especially in Brazil. But there are humans who actually harbor this virus, especially in that specific location in Brazil.

COMM. PIMENTEL-GANA:

Ah, okay. Thank you.

DR. JADLOC:

Yes Ma'am.

PANEL CHAIR CADIZ:

Father Walpole?

I have no further questions for the witness. Thank you very much.

ATTY. MAYO-ANDA:

May I ask that he be excused?

PANEL CHAIR CADIZ:

Yes.

ATTY. MAYO-ANDA:

Thank you, Dr. Jadloc.

PANEL CHAIR CADIZ:

Please present your next witness.

ATTY. PAUDAC:

Good afternoon, Your Honors. We are presenting our next witness or resource person, Mr. Glenn Stewart Hodes.

PANEL CHAIR CADIZ:

Please swear in the witness.

CLERK OF THE INQUIRY:

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

MR. HODES:

Yes, I do.

CLERK OF THE INQUIRY:

So, Mr. Witness, please state your name, citizenship, and address.

MR. HODES:

My name is Glen Stewart Hodes. I'm a citizen of the United States and I'm currently working in Bangkok, Thailand.

ATTY. PAUDAC:

Your Honors, Mr. Glenn Hodes is a climate policy and development expert, working on climate finance and green investment mobilization, policy advisory for low carbon, and climate resilient development. He's currently connected with United Nations Development Program (UNDP) as climate policy and finance specialist advising governments in the Asian region, pioneering the development of budgeting and financing strategies to enhance

resource mobilization and management efforts in support of climate action. But for today, Your Honor, we are presenting Mr. Hodes to share his expertise on the subject of valuing climate change impacts, its role as a risk multiplier for agricultural livelihoods, and policies for promoting more accountability to close gaps in financing and implementing appropriate responses. Your Honors, may I be allowed to ask questions to identify documents that Mr. Hodes submitted?

PANEL CHAIR CADIZ:

Please proceed.

ATTY. PAUDAC:

Good afternoon, Mr. Hodes. How do you want to be addressed? Glenn Hodes? Mr. Hodes?

MR. HODES:

Mr. Hodes.

ATTY. PAUDAC:

Okay, Mr. Hodes. I do have here four (4) documents. One is a "Statement of Glenn Stewart Hodes," dated August 13, 2018, consisting of six (6) pages, previously marked as "ZZZZZ." Kindly go over it. Another one is a document entitled "Curriculum Vitae of Glenn Stewart Hodes," consisting of three (3) pages, pre-marked as "AAAAAA," and another, an "Addendum, Publications Addendum of Glenn Stewart Hodes," consisting of two (2) pages pre-marked as "BBBBBB." And finally, a printed PowerPoint presentation of Glenn Hodes entitled "Valuing Climate Change Impacts: Its Role as A Risk Multiplier for Agricultural Livelihoods and Policies for Promoting More Accountability to Close Gaps in Financing and Implementing Appropriate Responses," consisting of four (4) pages, previously marked as "CCCCCC." Do you confirm that you submitted these documents to this Honorable Commission and to this representation?

MR. HODES:

Yes, I hereby confirm those are the documents submitted.

ATTY. PAUDAC:

On Exhibit "ZZZZZ," the "Statement of Glenn Stewart Hodes," there appears a signature above the name on page six (6), above the date August 20, 2018. Whose signature is this?

MR. HODES:

I confirm that is my signature.

ATTY. PAUDAC:

Do you confirm and affirm the Statement you submitted to be yours?

MR. HODES:

Yes, I can.

ATTY. PAUDAC:

Thank you. Mr. Hodes, you may now start your presentation.

MR. HODES:

Thank you, ladies and gentlemen, and esteemed members of the Commission. I am very honored to be part of this historic Inquiry, the third of a series of inquiries, and I am acting as an independent resource person with expertise in climate change policy and development, with over fifteen (15) years of experience working across many different countries in the developing world as well as having about two (2) or three (3) dozen publications and research articles also on this subject. I'm here today at the request of the organizers and the Petitioners to present my views on three (3) subjects. The first is how climate change acts as a risk multiplier. The second is how to promote or how to understand the impacts of climate change in an economic and socio-economic context; so we can understand the value of those impacts. And, thirdly, looking at solutions and accountability mechanisms to determine what sort of actions can be taken by the Commission and by the government to safeguard lives, livelihoods, and property threatened by climate change, both for current and future generations.

So the United Nations has, through various policies and decisions, recognized climate change as one of the seventeen (17) landmark Global Sustainable Development Goals for the 2030 Universal Agenda for Sustainable Development, and as a key threat to not only sustainable development but to achieving poverty reduction around the world, as well as social equality. There are many different impact chains we can say, and interrelationships between different socio-economic development factors. What we can say is that climate change acts as an independent risk but also compounds other risks to achieving these universal sustainable goals, and has a number of negative feedback loops that exacerbates and adds to existing sensitivity of those different risk factors. So for countries like the Philippines that are still, that have rapidly grown and have made a lot of progress in terms of sustainable development goals, and income, and social equality, this is a very important risk factor because of these interrelationships. Probably the most easy to relate to would be the poverty trap.

So there's a significant number of people in the Philippines whose lives are basically one step short of falling back below the poverty trap or poverty line and the impacts of climate change both one-off shocks as well as recurring events and recurring slow onset changes such as increased flooding over time, have the ability to set this large group of the population back to a point where they are again under the poverty line. And we've also heard from other participants in this Inquiry that these groups of people are also highly prone to some of the health diseases and stresses that others have talked to here. But at the same time, they're also highly dependent on the natural resource base of this country which is itself threatened; that biodiversity, the genetic diversity for their livelihoods. So I'm going to talk about some of those issues. I'm sure other people who have come also before this esteemed Inquiry have talked about climate change impacts, so I won't go into too much detail. But to say that there are a range of climate change impacts that are typically present in most countries and in, particularly, in Southeast Asia.

The Philippines consistently ranks among the top ten (10) countries most at risk from climate change. So that's looking at various indicators and indices over a long period of time. It's been particularly prone to hydro-meteorological disasters, increased flooding risk, and as many people have noted an increased frequency of storms and climate variability patterns that contribute to typhoons. And because of the high degree of sensitivity of these natural resources and the economic structure of the Philippines which is still in some ways has a very strong connection to agriculture sector, there is a high degree of socio-economic as well as geophysical vulnerability to some of these major impacts. And these various impacts obviously have many different chains of impact on other drivers of growth and development. Obviously economic activity, obviously productivity as we've heard, but other issues such as food security, access to water, physical health, as well as psychological well-being.

Now, in 2009 the Asian Development Bank conducted a study looking at what was the approximate economic cost of climate change in the ASEAN region. It looked initially at four (4) countries including the Philippines as well as Thailand, Vietnam, and Indonesia and at that early stage in 2009 it estimated that roughly five point seven (5.7) percent of annual GDP would be lost from the impacts of climate change by the end of the century. In addition to that regional study, the World Bank has also recently come out with a report for South Asia this year which identified heat stress and heat stroke as the most significant factor for South Asia for reduction of productivity particularly in the agriculture sector. And UNDP also supported the National Council for Sustainable Development and the Ministry of Economy, of Finance in Cambodia to look at modeling the economic and fiscal impact of climate change in Cambodia.

And although Philippines is not Cambodia, there are a number of similarities. They are both ASEAN countries, they are both rapidly developing, they are both coastal, and they have a very high degree of dependency on agricultural production particularly when you get to lower levels of the income strata in society. And this report that came out this year, showed that GDP growth would be reduced in absolute terms by two point five (2.5) percent from the impacts of climate change by 2030, and almost ten (10) percent, in fact nine point eight (9.8) percent by 2050.

So when looking at these numbers in context, of course, we must look at what are these numbers representing. Well generally, there are three (3) different types of sources of this reduction in economic output that's captured in these studies. The first would be the direct damage to assets and infrastructure, so for example a hospital that is washed away in a storm or a typhoon. The second would be the loss of productivity as a result of the various climate change stresses and shocks. So we've heard already from the farmers in the Philippines who have drastically reduced their number of working hours per day because of heat stress, but also in urban areas we can imagine the workers in Manila who are unable to do their duties because of this severe asthmatic condition. So those would be the second type of activities measured in these studies. But the third would be some other lower income and indirect effects from reduced output and activities. So this would also look at for example, lower yields from fishery production as a result of changing species and biodiversity loss and the reduced functioning and health of ecosystem services.

So there are other effects such as extreme cases where climate change is causing internal displacement and migration. And that can also lead to other macroeconomic impacts and social costs to address those sorts of issues as well as thinking about the indirect impacts on important sectors for the Philippines such as tourism. So the disappearance of coral reefs, for example,

and other pristine habitats linked to climate change will have a direct and indirect impact on the ability of the Philippines to become a primary tourist destination and for that to support its economic growth. I've been asked specifically to talk about agriculture sector and its vulnerability. I'm not an agriculture expert but UNDP has been working together with the FAO, Food and Agriculture Organization, together on integrating climate change into agriculture sector planning, and I'm associated with this program which has been working in a number of countries globally including the Philippines.

So my testimony includes citations from the FAO, the International Food Policy Research Institute as well as the Lopez Center which had done a very good climate change assessment report last year on impacts in the Philippines. And all of these different reports mentioned in my Statement strongly highlight the particular level of vulnerability of the agriculture sectors in the Philippines. Because almost a third of the labor force in the Philippines and as much as eleven point three (11.3) percent of the current GDP in the Philippines is linked to this sector. Some of the things that are being experienced already include variable output and reduced overall output of maize because of temperature stress and water stress. There are predictions for very large reductions in maize production.

In communities that are dependent on coastal and marine resources and fishery stocks, they are also in different places noticing declining yields and production as well as a loss of species. And for people themselves, obviously the poorer segments of society in this particular agricultural communities they tend to be also more reliant on staple food products for their consumption. They tend to have a higher daily consumption of protein from fish. So their nutritional well-being and their overall consumption of food is also more sensitive to reductions in this area and their income is also very highly elastic to price changes.

So what these studies have also modeled and shown is that these staple food products are likely to increase in price due to higher degree of scarcity and reduced output and availability of these staple food products. So there would be a significant direct socio-economic impact there that has been modeled. That was and for example, the 2015 IFPRI study which showed the economic loss of the Philippines from changes in food production and consumption being roughly around one hundred eighty-six billion (Philippine) pesos (PhP 186,000,000,000). So that gives you an idea of how climate change might affect the agricultural value chain in particular.

Now, I'd like to talk a little bit about the role of climate change and human rights. I think, for me, this Inquiry is really about putting a human face on all of these numbers. What is the human dimension of such a great magnitude of economic and welfare loss? And so, we have heard today and the last days, over how communities on the ground and how people at the local level are

embracing these issues. Because climate change impacts not only affect ecosystems and natural resources, physical infrastructure, settlements, and livelihoods but they very directly affect the choices and the resources available for humans to lead lives of dignity. At the most extreme level that is their right to life, but in other cases that is their right to health, right to water, their right to have food on the table, their right to decent shelter. And so, it is not surprising with these very personal and intimate rights that the U.N. has increasingly placed a stronger emphasis on the relationship between climate change and human rights.

And there, my presentation includes a statement from the Special Rapporteur on Human Rights and the environment describing the irrefutability of the connection between climate change and human rights as well as the fact that even recently, there has been an increased effort to suggest that there is a strong duty that governments have to promote public trust and to take climate change on board as a particular issue that should be taken up by human rights institutions and other accountability institutions within government.

So that, I believe is a good way to frame my last slide, which is, what sort of things can we do about this? And what particular role, you know, might the Commission play in this process? Well, again, in the context of the overall 2030 sustainable development goals, one important take-home message that we have is that no one shall be left behind in this process. And the most climate-change vulnerable population groups in the Philippines would certainly be in that category of being highly threatened to be left behind in the SCG goal process in part because of their high degree of vulnerability to the threat of climate change. So as the Philippines and other countries around the world work to frame their responses to the 2030 agenda, it important to recognize that governments have committed universally to a global duty of care to address climate change. It is independently one of the major Sustainable Development Goals with strong linkages to several other of the goals. But the SDG agenda also calls upon business to integrate climate change as a risk to sustainable development results and calls upon business to provide resources and innovative thinking to address these problems.

So for me there are a number of different solutions that I've identified from a policy point of view. My first and most important point and that I'd really like to get into questions from the Commission on this is that the Philippines actually does have quite a number of positive foundations to build upon, not least of which is its policy framework. There is a good policy framework for climate change in the Philippines. For example, the National Climate Change strategic policy and plan actually has a very clear link to human rights. At least two (2) of its of four (4) strategic pillars talk about food security and human security and the government's progress towards those and its expenditure towards those climate change policy priorities are tracked and monitored by the Climate Change Commission and the Climate Expenditure

Tracking System. So there is already some degree of transparency that can be built upon.

The second is that the Philippines signed the Intended National Determination or Intended Nationally Determined Contributions, excuse me, to the Paris agreement or INDC. And this was signed and ratified and that actually I'm going to read a quote from that because I think it's very important. "This NDC" and I will quote, "acknowledges that public financing will prioritize adaptation to reduce vulnerability and risks to the community at the same time providing a policy environment that will enable participation of the private sector to optimize mitigation opportunities and reduce business risks towards a climate-smart development." So that overarching vision is an important way for the Philippines to move forward and take in solutions. And I've mentioned in my Statement some opportunities I think for the government and the Human Rights Commission to work to facilitate and accelerate a consolidated approach at the local level to building resilience to climate change.

Building again on some existing frameworks, for example, there is a community- based monitoring system that has been set up. For example, there is also a bottom-up budgeting approach which strongly relies upon local participation in the identification and the allocation of priorities for climate change. But more can be done. For example, developing robust guidelines for corporate social responsibility that would ensure a certain percentage of turnover is dedicated towards climate change resilience at the community level. And developing a more consolidated monitoring and reporting framework so that the government and corporations together can show and demonstrate genuine investments into actions that build resilience at the ground level of the most vulnerable population groups, particularly the farmers and the fisherfolk that I've mentioned who are at the frontlines of climate change.

So I believe there's also a number of things that can be done at the regulatory level. Not only in terms of placing a monetary value on emissions and ensuring that money that is collected from that whether in the form of taxation or permit charges is recycled and used towards climate change adaptation measures. But also ways to promote that companies active in the Philippines or that are listed on the Stock Exchange in the Philippines comply with certain measures to show that climate change is being factored as a material risk not only an environment risk, a business risk, an operational risk to business continuity to liability, and to a number of other risks including worker safety. So these are some of the suggestions that I'm happy to elaborate more in the questions and answers. And I thank you very much for your attention.

ATTY. PAUDAC:

Thank You, Mr. Hodes. Your Honors, may I be allowed to ask just one question?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

In the interests of time I will just be asking this question. I'm more interested on your presentation as to climate change as risk multiplier. Can you please expand on that? And how does this concept of climate change as a risk multiplier help this Honorable Commission identify climate-related harms in the course of this National Inquiry?

MR. HODES:

Thank you, it's a great question. I would probably answer that in terms of an analogy. If you can think about mobility as being important to everybody's everyday livelihood and also to increasing welfare. Now, we all have risks every day from driving on the road. For example, there's a certain probability we might get into an accident. And if we think about climate change as being a discrete risk but also one that influences other things, for example weather-related issues might cloud the visibility of our car, we might then be more likely to get into an accident by that. And in a more extreme case, a severe climate related disaster like a landslide could wipe out the road entirely. It could kill us or it could disrupt the flow of goods and services on that road and not enable us to set out to accomplish our economic activity for that day or to get to a hospital when we're in a crisis.

So I think if we think of that analogy as saying that this climate change is multiplying and compounding and exacerbating a risk that already was there, there's a certain risk that we might get into an accident or not reach our destination. So I hope that analogy helps to frame the idea. You know, as I've said, disentangling all of those different risk impacts and the interrelationships between different (factors) is a bit complicated and studies have been underway to do this in the Philippines and other countries. And that process of investigation and research will help to also identify priorities for action and priorities for investment, not only by the government but also by the private companies that also wish to take part in climate action.

ATTY. PAUDAC:

Thank you Mr. Hodes, and that will be all for the witness, unless you do have questions, Your Honors.

PANEL CHAIR CADIZ:

Thank you very much. Commissioner Gwen Pimentel-Gana?

COMM. PIMENTEL-GANA:

A comment and a question, I guess. Thank you, Mr. Hodes for pointing out actually the interrelatedness of the issue of business and human rights and with climate change. For me, it's a very important thing and thank you for pointing out also the framework that is already existing in the Philippines through legislation and policy. And I was just wondering, and you were saying that agriculture remains a major economic activity and very vulnerable. So would you have a study that would show how agriculture has actually been affected since maybe 1990s up to now, to 2000, I mean this year and so on? So would you have any study on the matter how agriculture has been affected?

MR. HODES:

Yes, as I mentioned there have been specific studies looking at food security risks and agricultural impacts that have been conducted here by the Food and Agriculture Organization as well as IFPRI, International Food Policy Research Institute. Other aspects are taken up by the climate change assessment reports and vulnerability analyses that have been undertaken by the Lopez Foundation. And in addition, the ministry itself that handles agriculture, the Ministry of Agriculture is undertaking as well currently some analyses of priority areas for adaptation options in these sectors and particularly looking at fisheries as a strong focus. So there will be, I mean, there is already and there will be, I think more and more information dedicated to the impacts and vulnerabilities for agriculture, available in the Philippines specifically. Yes. Yes.

COMM. PIMENTEL-GANA:

So where… or can we get those studies?

MR. HODES:

We can provide by email reference. Some of them are referenced in my Statement but we can provide electronically.

COMM. PIMENTEL-GANA:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Dumpit? Dr. Walpole?

Alright, I just have a few questions, Mr. Hodes. I appreciate the fact that your paper and your testimony today actually put forth certain suggestions which this Commission, this Inquiry Panel, can adapt as among its set of recommendations. And I am particularly interested in your discussion on climate financing, specifically how investment funds… how funding can be put to encourage compliance by private corporations or to encourage them to come up with more climate-friendly programs and policies. And you mentioned a system adopted in Colombia that was designed to promote climate-friendly standards for corporate citizens. Could you elaborate more on this and its success rate? When was this implemented and what is the impact that this policy has created?

MR. HODES:

Right. Thank you. Actually, in the example I mentioned in Colombia, it is more about bringing a cohesive view of investment in climate action. And so that, there's a single platform to monitor, report, and verify on that including private investment. So it's a way also of matching supply and demand and a way of tracking not only public spending but investment going into those areas. And it's relatively new so I don't think we have enough experience but it does seem to be a very promising way of bringing the different strands together, in a way that also ensures that private investment is genuinely being used to support local level and locally determined priorities based upon participatory approaches, such as the bottom-up budgeting process and the involvement of highly sensitive and climate vulnerable groups like indigenous people and women. So I do think that is a model that could be quite interesting here.

In terms of the governance regulations and guidelines, I might say for example, the Bangladesh Bank which has used a number of different

instruments including what was called Mandatory Credit Quotas or Targeted Refinancing Line. These are basically incentives that the Central Bank uses to ensure that lending and credit and operations by businesses promotes investment in specific categories, specific asset classes. For example, water efficient agricultural production technologies, drip irrigation, green energy. So those types of instruments and monetary tools can also shape and define how companies will be able to have access to funding in order to pursue low-carbon development and low-carbon investments.

But also these guidelines can shape and define what kind of incentives, companies have to invest in adaptation at the community level, and to mainstream those guidelines into corporate responsibility reporting and basically operational licensing matters as well. So it's quite interesting work coming out of Bangladesh. That area is actually fairly new, some of those regulations but there's a lot there that the Philippines can also learn from. As well as other emerging markets that I've mentioned like the Johannesburg Stock Exchange, and a number of countries even Thailand where I'm from, is also trying to develop a sustainable stock exchange where there are specific incentives for companies to include climate change as a key risk in their reporting and as a disclosure requirement. But on a positive side to create incentives to acknowledge and provide rewards for companies, by acknowledging these steps that they've taken to invest in greening their supply chain and in promoting community-based adaptation resilience as part of their day-to-day business operations.

PANEL CHAIR CADIZ:

And you also mentioned that more and more institutional investors in other parts of the globe are being required to look into the carbon footprint of their clientele. Could you elaborate a little more on this requirement being made and on compliance? Well, I imagine that it would be easier to make the institutional investors comply.

MR. HODES:

Yes. Many of those have been initiated in developed countries like in France, in Japan, and also recently in the London Stock Exchange. There is a requirement that companies must conduct some kind of carbon footprinting analysis before they're able to be listed and there's a lot of variation in terms of what that means, because there's different levels of depth and detail about what kinds of emissions are reported. Some of them are just direct use, or like for example, car usage or flights. You know the direct footprint of company operations, the direct fossil fuel consumption of companies in their operations, but more challenging, and, in some cases like in France, they are moving

towards encompassing other indirect activities associated with the production. And I'm sorry, not just the production but also the downstream consumption of the products of these companies. So that tends to be much more serious in terms of the level of emissions, in terms of the quantum of emissions but also provides a higher degree of transparency around the true carbon footprint of these companies.

So in terms of compliance they are the examples cited in my Statement where these are mandatory requirements. But in addition to the mandatory requirements, there has been for some time voluntary reporting requirements which is the Carbon Disclosure Project, the Global Reporting Initiative, and other international standards for companies to report on their climate change footprint. And to do that not at an ad hoc or in an isolated way, but increasingly in an integrated fashion to again recognize that this climate change is not necessarily considered a discrete economic or a discrete environmental risk, but really is a holistic issue of risk and one that really needs to be addressed as a cross-cutting and very immaterial environmental social and governance risk that companies face to their business.

PANEL CHAIR CADIZ:

I have no further questions. Thank you very much, Mr. Hodes.

MR. HODES:

Thank you very much. It's been a pleasure.

ATTY. PAUDAC:

May the witness be excused, Your Honors?

PANEL CHAIR CADIZ:

The witness is excused. So we have your final witness for today?

ATTY. MAYO-ANDA:

Good afternoon again, Your Honors. Our last witness for today is Sophie Marjanac from Client Earth.

PANEL CHAIR CADIZ:

Please swear in the witness.

CLERK OF THE INQUIRY:

(Inaudible sounds)

MS. MARJANAC:

I do.

CLERK OF THE INQUIRY:

Kindly state your name, your citizenship, and your address.

MS. SOPHIE MARJANAC:

My name is Sophie Marjanac. I'm Australian and the address of Client Earth in London is 274 Richmond Road A83QW.

ATTY. MAYO-ANDA:

Our witness, Ms. Sophie Marjanac, is for the purpose of enabling her to share the findings of two (2) studies. One study refers to the "Acts of God Human Influence Integration" and another study is entitled "Extreme Weather Event Attribution Science and Climate Litigation: An Essential Step in the Causal Chain." Ms. Sophie Marjanac is a lawyer. She works on climate and financial accountability projects of Client Earth. Your Honors, Client Earth is a global environmental legal charity which is based in various offices in the world and one of the objectives of this global organization is to commission research into law practice and administration of justice in connection with the environment including direct or indirect impact of any human activity in the environment and also to disseminate the useful results of their research. And before I proceed, Your Honor, may I be allowed to ask the witness certain questions?

PANEL CHAIR CADIZ:

Please, go ahead.

ATTY. MAYO-ANDA:

Good afternoon again, Ms. Sophie. Can I call you Sophie?

MS. MARJANAC:

Yes, please do.

ATTY. MAYO-ANDA:

Okay. Yes, thank you. I have here with me five (5) documents. The first document consisting of sixteen (16) pages, could you please take a look at this document it refers to a Statement of Ms. Sophie Helena Marjanac.

MS. MARJANAC:

Yes, that's my witness Statement.

ATTY. MAYO-ANDA:

Now on the last page of this document, there is a signature, could you please identify the signature?

MS. MARJANAC:

Yes, that's my electronic signature.

ATTY. MAYO-ANDA:

Your Honors, please this has been previously marked as Exhibit "DDDDDD" until Exhibits "DDDDD-15" and the signature as "DDDDD-15-A". The next document, Ms. Sophie, is a Curriculum Vitae consisting of two (2) pages. Kindly take a look at that document?

MS. MARJANAC:

Yes, that's my CV.

ATTY. MAYO-ANDA:

Okay. Now with respect to this document, the second document Your Honors has been previously marked as Exhibit "EEEEEE" and "EEEEEE-1". Do you confirm and affirm that the contents of this document are accurate?

MS. MARJANAC:

Yes, I do.

ATTY. MAYO-ANDA:

Now the third document refers to a Journal of Energy and Natural Resources Law consisting of thirty-five (35) pages. Could you please take a look at this document?

MS. MARJANAC:

Yes, that's an article that I drafted and that was published in April of this year.

ATTY. MAYO-ANDA:

Okay, this document Your Honor, has been marked "FFFFFF" until "FFFFFF-34" and this has been contained in the ex parte manifestation Your Honor submitted last June 27, 2018. The next document Ms. Sophie, refers to a PowerPoint presentation consisting of thirteen (13) pages entitled "Extreme Weather Event Attribution Science and Climate Change Mitigation."

MS. MARJANAC:

Yes, that looks like my Powerpoint presentation.

ATTY. MAYO-ANDA:

Okay. Now this has been previously marked, Your Honors, as Exhibit "GGGGGG" until "GGGGGG-12" and the last document refers to an eight (8)- page document entitled "Climate Change Effects on the Worst Case Storm Surge: A Case Study of Typhoon Haiyan." Please take a look at this document.

MS. MARJANAC:

Yes, this is a study that I did not write but that I refer to in footnote thirty (30) of my witness Statement.

ATTY. MAYO-ANDA:

Now do you confirm and affirm that these documents were submitted to the Honorable Commission and to this representation?

MS. MARJANAC:

Yes, that's correct.

ATTY. MAYO-ANDA:

Okay the last document, I'd just reiterate Your Honor as Exhibit "HHHHHH" until Exhibit "HHHHHH-7" has been submitted as well to this Commission and I understand that you have provided a copy as well. Thank you.

PANEL CHAIR CADIZ:

Before you proceed, just for the record, I would request the Clerk of the Panel to confirm the markings that have been put on the record.
Alright. You can proceed to examine your witness.

ATTY. MAYO-ANDA:

Thank you, Your Honors. Ms. Sophia you may now proceed with your presentation.

MS. MARJANAC:

Thank you very much and I'd like to say it's a great privilege to participate in this very important National Inquiry. I am an Australian legal practitioner and have been employed by Client Earth in its London office since 2015. And in June of this year, I was asked by the Petitioners to act as a resource person in this National Inquiry. Primarily I was asked to outline the contents of two academic articles that I authored. One which was published last year and the second article just manifested for the Honorable Commission was published

in April of this year. These two articles discuss the new and emerging science of extreme weather event attribution and its relevance for climate change law and litigation. In the first part of this presentation, I propose to summarize the contents of those two (2) articles and at the outset I would like the Commission to please note that I am not a scientist. I am a lawyer and I don't profess to have any scientific qualification.

Therefore, my explanation of the science of extreme weather event attribution is simply based on my review of event attribution studies and discussions that I have held with expert scientists working in this field. I was also asked by the Petitioners to provide other information that may be of relevance and interest to this Commission, and to that end the second part of this presentation will consider how the risks of climate change will impact the legal duties of the respondent companies to this Petition that is the Carbon Majors and their directors. I'll also discuss how the expectations of the financial sector regarding climate action by the Carbon Majors is rapidly changing. And to conclude the presentation today, I will turn back to some recommendations and suggestions made in our Amicus Curiae Brief which applied the United Nations Guiding Principles on Business and Human Rights to climate change and suggest some recommendations that the Commission may like to consider as part of this Inquiry.

So firstly turning to the science. The science of extreme weather event attribution is relatively new, around just over a decade. And it was developed by scientists to respond to questions from the public about whether human-caused climate change had caused or worsened specific extreme weather events such as droughts, storms, or floods. Event attribution science relies on the same models that are used in traditional climate science which studies change at the global level and global scale; however, it studies extreme weather occurring at a local and regional level. And for this reason, we said in our articles that extreme weather event attribution science really studies the way that many people in the world will actually experience climate change in their lives. And that is through increasing extreme weather events, increasing drought, heat wave, storms, and floods.

This science may, therefore, be of interest to this National Inquiry because the extreme weather that's predicted to increase as a result of human-caused global warming will directly impact the enjoyment of human rights by Filipino people and people around the globe. So the very first event attribution study was published in 2004. And it studied the influence of greenhouse gas emissions on the 2003 European heat wave and that heat wave was unprecedented in its scope and led to a large number of heat related deaths across Europe. It's crucial to note, that scientists state that they prefer not to answer the simple question of “Is this event climate change?” and rather the more scientifically correct question is, “how has climate change made this

event stronger or more likely to occur?" And why that is, will become clearer as I explain the basics of the methodologies used.

So event attribution science relies on existing climate models which simulate processes in the Earth's atmosphere. So although there are several approaches, the primary approach is to compare the changes in the observed record over time with climate models simulating the real world with a counterfactual world. That is a world in which the Industrial Revolution did not occur and human greenhouse gas emissions were not a relevant factor in creating climate and driving weather events. So essentially, the real world, which is defined through observations or weather records and models, is compared to this counterfactual world - which is the world without human greenhouse gas emissions. And this process allows a scientist to isolate greenhouse gas emissions as a causal factor and then, they can understand how they have affected that particular extreme weather event.

So as we've heard from other experts in the Inquiry, there are a number of factors that scientists called forcings that influence climate and weather. And these include deforestation, aerosol use, volcanoes and human activity, human greenhouse gas emissions, sea surface temperatures, large circulation of air over the oceans, etcetera. And so, this science isolates exactly how just one (1) of these factors and that is human greenhouse gas emissions since the beginning of the Industrial Revolution changed and influenced specific extreme weather events. As this is a counterfactual technique, the results are expressed as risk ratios in the same way that medical evidence is often presented in epidemiological studies.

So to illustrate this just as one can never be sure that a smoker would not have developed cancer had they never smoked; because climate has a range of natural variability, and one can never know what would have happened in the counterfactual world. Event attributions studies express their results as probabilities and not as simple causal statements and that's why it's often extremely difficult to say, this event was caused by climate change. So to illustrate the way that the results are presented, I'll give a few examples. So in last September Hurricane Harvey devastated the South of the United States that caused billions of dollars' worth of damage. One of the most costly hurricane seasons ever experienced. Scientists have now published a peer-reviewed study into the impact of human greenhouse gas emissions on that event and they found that the heavy rainfall associated with Hurricane Harvey was made three (3) times more likely and fifteen (15) percent more intense because of human influence. Although they still found that this was still an extremely rare event.

A more recent study that looked at the recent drought in the Western Cape of South Africa, found that the chances of this event had increased by a factor of three point three (3.3.) And then, interestingly in this study, the scientists went

further and they actually predicted the likelihood of that drought event occurring in a world with two (2) degrees of warming. So at the moment, the globe is already at one (1) degree of average global mean surface temperature rise. So in a world with two (2) degrees of warming, droughts such as the drought recently experienced in South Africa would be six (6) times more likely. So that changes that event from one (1) in one hundred (100) year event, which is the return time, so that's an indication of how likely the event will occur. Of course, that doesn't mean that it will occur every one hundred (100) years, but it changes the likelihood of that event from one (1) in one hundred (100) year event to a one (1) in sixteen (16) year event.

The third study very recently, was undertaken in respect of the recent extreme high temperatures in Northern Europe. And that was just at the end of July this year. And it found that human emissions have made that event at least two (2) and up to five (5) times more likely because of climate change. And that was a rapid study so that hasn't yet been peer-reviewed but it's available on the World Weather Attribution website which is a rapid response system that scientists have set up to answer questions from the public about extreme weather directly in the aftermath of the event. So event attribution science has been systematically and thoroughly peer-reviewed. In 2016 the American National Academy of Sciences published a comprehensive review of the methodologies used. And they found that those statistical techniques used by event attribution scientists were accepted and generally recognized and they essentially validated the robustness of that methodology. They acknowledged that there were certain uncertainties in relation to certain studies and they made comments about methodology, but, however, they essentially validated the basic methodology.

I've also noted in the first bullet there that the American Meteorological Society publishes annually a set of extreme weather event studies from the previous year and this group of studies are representative of the range of the field and the authors of the BAMS Report as it's called, Bulletin of the American Meteorological Society, have noted a rapid rise in the number and quality of event attribution studies each year. And in 2017 for the very first time, they published three (3) studies, that concluded that certain heat related extremes would not have been possible were it not for human greenhouse gas emissions. These studies confirmed that human emissions had taken these heat related events outside the realm of possibility of natural variability. That is this event was not simulated in the counterfactual world without humans. And that's really alarming, but it's interesting because it shows that this event would not have occurred but for human greenhouse gas emissions.

So what does this mean for the law? Firstly, this new science is relevant for a range of actions falling within the definition of climate change litigation. And it's important for a range of actions occurring around the world at the moment. And firstly and importantly, that's because this science provides

evidence of the specific and quantifiable harm to individuals at the regional and sub-regional level in contrast to much global climate change science which is at the global level. This really draws it down to specific events and impacts on specific people at specific times. So that's really important as a piece of evidence in a range of climate change cases.

It's also very important because as I explained and was shown by the results of that study of the South African drought, you can see that what these studies provide is predictive information about how often these kinds of events are going to occur in the future. So not only do we not just have generalized information but we have quite specific information now about what impacts will occur in specific regions and we understand these events better, so we understand the drivers of these weather events better. And this is important for the law because it affects the element of foreseeability. That is, one doesn't just know that in general extreme weather events will increase, rather, one knows exactly how and when and at what frequency. And this foreseeability of harm is an important element as in the establishment of negligence in many legal systems around the world and in the establishment of liability under other causes of action as well as mentioned by Mr. Carroll Muffett yesterday. So therefore legally, event attribution science is also important for actors with legal duties to prepare for and adapt to a changing climate.

So this information is, therefore, important for governments, companies, and other actors charged with protecting people from the physical impacts of climate change. So to take the South African example again, if one knows and if a water manager knows that these droughts are going to be rapidly increasing in frequency, then they need to be adapting their infrastructure. They need to be making sure, that the sort of day zero situation that was recently faced by Cape Town which essentially was, that it was about to run out of drinking water and that it may have needed to switch off the taps. If governments and authorities can foresee that event, then, they may very well have legal duties to adapt to that foreseeable eventualities. And this applies to professionals as well, to engineers and architects, and the way that they design buildings and infrastructure. And it also applies to companies. For example, take the instance, take the example of a tropical storm. An insurance company needs to make sure that it has enough money to pay out increasing claims from increasing storms and hurricanes perhaps in the South of the US. And I note that last year was the most expensive year for US insurers on record.

So this segues into the second part of my presentation. But the point on the litigation implications of event attribution science is that as these extreme weather events increase, litigation and liability will arise as a result of these increasing losses and it's really important that those people with legal duties to protect people and assets from the changing climate, take note of this new science and prepare accordingly.

And the second part of my talk will look at the implications of this for the private sector and for companies and for private actors. So and the consequences that this may have to the Respondents to this Petition, particularly the Carbon Majors who as we've heard from Mr. Richard Heede are among the largest greenhouse gases gas emitters and contributors to greenhouse gas emissions through their operations and products. So I'm discussing this today as the Commission might be interested to hear about the ways that the financial sector and investors in many of the responding companies are becoming concerned, not only with the risks of climate change to people and human rights, but with the financial risks that climate change poses to specific companies and the economy as a whole. And we'll talk about how the economic impacts of climate change affect the legal duties of the Carbon Majors and their directors. But overall there's been a huge increase in interest in this area among the financial sector actors in the past three (3) years. And the direction of trajectory is clear. Disclosure and expectations of the Carbon Majors are highly likely to increase in respect of climate change in the coming years. However, the link between this financial agenda and human rights is really made and I will attempt to do that today.

So this agenda really began in 2015 with a speech by Mark Carney, the Governor of the Bank of England, where he outlined how climate change was putting investments at risk and putting the financial stability of particular insurance companies at risk. And in this report that I've referred to on this slide, he set out three (3) categories of risk to private companies from climate change. Those were physical risks so that's the risks from extreme weather events that I've just mentioned, transition risks (losses that could occur to companies due to the transition to a low carbon economy in the example there is the collapse of the U.S. coal sector in 2016), and, then, of course, litigation risks. So litigation and compensation liabilities arising from tort claims and we've seen in the last twelve (12) months a wave of tort claims in the US that has made that liability risk very real.

Coming out of Mark Carney's report and the short seminal speech that he gave in late 2015, the G-8 which are the eight largest economies and The Financial Stability Board that's established by the G-8, set up a Task Force on Climate-Related Financial Disclosures called the TCFD and they were an industry-led, an investor-led group that also included some corporate representatives, representatives of BhP Billiton was on the task force. They took over twelve (12 months) to finish the study and they released their final recommendations report last year. And that report suggests that to protect investors and the economy from the risks of climate change, companies should be reporting and disclosing to their investors how climate change will impact their business. And the final report suggests that companies disclose in relation to governance, strategy, risk management, metrics and targets. But really importantly that final bullet that I want to emphasize is that they recommend

that companies disclose a two-degree scenario analysis and that companies tell their investors and shareholders how they will operate in a world in which governments implement the regulation required to meet the temperature goal of the Paris agreement. And that's really crucial for this Inquiry because it shows that companies are already doing a lot of work on how climate change is going affect their business.

So the direction of travel is clear; there are moves around the world and for the TCFD recommendations to be adopted into the listing rules of various stock exchanges. Investors are starting to simply demand that this disclosure be standard and I think that they're moving even beyond disclosure to actual action and mitigation of emissions by these companies. This is important for this Inquiry because that demonstrates that the expectations of investors and financial regulators are increasing. And given that this additional disclosure is the clear direction of travel, it's reasonable to expect the Carbon Majors to disclose how they intend to respect human rights by publishing business plans that describe their operations and activities in a world in which global warming is kept to well below two-degrees (2°) and even at one point five-degrees (1.5°).

So simply put, such a process would not impose too heavy a burden on the companies given that they are likely to be undertaking a similar exercise and the financial implications of climate change as part of TCFD disclosure. So now very briefly turning to our work on director's duties, Client Earth has analyzed the duties of company directors in mainly Commonwealth jurisdictions and essentially the results of our findings are that directors' duties require company directors and corporate directors to act in the best interests of their company, and with reasonable prudence due diligence and skill. So in some jurisdictions, there's an explicit requirement to consider stakeholder interests and their company's role as a good corporate citizen.

So it's clear that the law says that it's not acceptable to fail to manage material climate risks and also that legal duties do not prevent company directors from concealing human rights and environmental impacts in business decisions, and in some cases may actually require them to do so. So this analysis shows that, at least, some of the directors of the Carbon Majors, those that are headquartered in in Commonwealth countries, and I note that these duties are generally global, already have existing legal duties to take account of and manage climate related financial risks including risks arising from more extreme weather. And this is relevant to their human rights responsibilities that these companies have on other instruments including the United Nations Guiding Principles because it demonstrates that company directors are not required by corporate law to pursue profit on behalf of shareholders at the expense of other stakeholders. And then accordingly there is no barrier in corporate law for a finding by this Commission that UN GPs required companies to reduce and mitigate their emissions in order to respect human

rights or at the very least, to carry out a due diligence process that examines the impacts of their direct and indirect emissions on human rights.

So in my opinion, the implications of the legal duties of company directors for the management of climate change remains an open question that may one (1) day be tested in court and this is extremely interesting; because as we know scientific evidence confidently predicts that a world in which warming goes above two degrees (2°) and hits three (3) to four (4) degrees, we know that that will have massive ramifications not only for human civilization but the economy. In fact, there is no profit to be made in a three (3) or four (4) degree world. And, therefore, one may ask, is it in the best interests of these companies for their directors to be investing in fossil fuel projects that take the world above that threshold? And I think perhaps we may see litigation on that point, at some point in the future. But that's my personal prediction.

So briefly to finish, I'd like to outline some suggestions for recommendations that the Commission might like to consider as part of this Inquiry. So in our Amicus Brief we looked at what the UN GPs mean in the context of climate change, so we know that climate change affects the enjoyment of a range of human rights and we've heard it in this National Inquiry. So we assess what the existing framework, being the United Nations Guiding Principles, requires the Carbon Majors to do? What is an effective due diligence process? And what is an effective remedy that can be implemented by these companies to prevent human rights violations and impacts from their greenhouse gas emissions? And we concluded that the minimum standard for human rights compliance by both states and companies should be related to the internationally agreed Paris agreement, which is the form made under the United Nations Framework Convention on Climate Change.

The temperature goal of the Paris agreement represents the global consensus on the absolute minimum required to protect the world from the worst impacts of climate change. Governments around the world have agreed that going above two degrees (2°) has significantly dangerous consequences and impacts. And therefore the Paris agreement should represent the hard legal standard for compliance with human rights law by both states and multinational corporations. And then, accordingly, the responding companies to this Petition should be made to explain how they will operate and how they will mitigate their emissions to align their business plans with that target of well below two degrees (2°) pursuing effort efforts to one point five degrees (1.5°). And this interpretation is the best interpretation in this emerging area of law as it is tied to this internationally accepted and agreed law - a law that has near universal acceptance among nation states.

So in this context we have suggested the following recommendations or findings that the Commission might like to consider. In respect to human rights due diligence process in the context of climate change, this due

diligence process ought to ensure that companies have a strong governance framework; make a commitment to reporting in line with the TCFD recommendations; include a robust analysis developed in consultation with stakeholders, and stakeholders must include those people most affected by climate change or whose human rights are affected by climate change in the jurisdictions in which the companies operate. And then finally, describe how the company will align its business plan with the well below two degree (2°) and one point five degree (1.5°) temperature goal of the Paris agreement and in order to respect human rights and to fulfill their legal obligations under existing human rights law. Thank you.

ATTY. MAYO-ANDA:

Thank you, Ms. Sophie. Your Honor, may we be allowed to ask questions?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Okay. Thank you, Sophie, for that valuable presentation. In your Statement you mentioned about the study on Typhoon Haiyan in 2015. Actually, you mentioned that the maximum storm surge in the Gulf of Leyte maybe worse by up to twenty percent (20%) as a result of human greenhouse gas emission. So what would be the significance of that study for this National Inquiry?

MS. MARJANAC:

So that study was was, in fact, the only event attribution study that I found on Super Typhoon Haiyan of 2013. It was conducted by a group of Japanese meteorologists and it's really interesting study because it looks not at the rainfall associated with the storm, but the storm surge which we know is one of the most destructive parts of these kinds of tropical storms and that was one of the major causes of death with Typhoon Haiyan. And so taking what they knew about the depth of Leyte Harbor, the impact of the increased temperature that increased the ferocity of the typhoon, and then, the scientists modeled the storm surge and modeled Typhoon Haiyan in a range of different conditions and they removed human greenhouse gas emissions from their experiment to isolate that factor and to show how that had changed the event. And they had really strong results. With fifteen (15) out of the sixteen (16) different model runs that they ran, they showed that the human emissions had increased the

strength of Typhoon Haiyan. And overall they calculated that the storm surge was made twenty percent (20%) worse by human influence.

ATTY. MAYO-ANDA:

Because we had testimonies from Tacloban and also Dr. Jonathan a while ago, so did that study make any recommendations?

MS. MARJANAC:

For disaster resilience?

ATTY. MAYO-ANDA:

Yes, for disaster resilience.

MS. MARJANAC:

No, because it was really just a technical study of the weather event. I need to review it again but I think it may, if it did make those recommendations it was just in passing. I think because that wasn't really the expertise of those scientists and they were more meteorologists and technical experts.

ATTY. MAYO-ANDA:

Thank you. Now you also mentioned about the U.N. Guiding Principles and you also mentioned in your slide that corporate directors have legal duties actually to consider human rights and environmental law in making business decisions. But having mentioned about event attribution science, how can companies use event attribution science in ensuring effective human rights due diligence on climate change?

MS. MARJANAC:

So I think not just companies but all actors with duties to keep people safe from our changing climate should be paying close attention to event attribution science. Event attribution science really needs to be integrated into the catastrophe models and the disaster models that many people are using. So companies may well look at this in terms of how they protect their own assets, but from a human rights perspective they also need to. And, as a result

of their direct and indirect emissions, they also need to be looking at how through a human rights lens those impacts are being mitigated. And so in terms of adaptation plans, I think it's important that a range of actors, not just the Carbon Majors take this new science into account.

ATTY. MAYO-ANDA:

Thank you, Sophie. That'll be all, Your Honors.

PANEL CHAIR CADIZ:

Commissioner Pimentel, do you have questions? Dr. Walpole?

Okay. I just have a few questions, because this is such an interesting topic that you have raised, something that I've heard for the first time today, which is that, according to a nascent science called event attribution… This science has been applied to other fields other than the field of extreme weather events? Would you know other areas where this nascent science has been applied already?

MS. MARJANAC:

No, although the methodologies are standard statistical techniques comparing the probabilities of an event in the real world versus a counterfactual world. But really, the science was developed to explain how human greenhouse gas emissions change the intensity and strength of extreme weather. So specific extreme weather events.

PANEL CHAIR CADIZ:

But if you mentioned the term "probabilities"… so it talks of the probability of a certain event happening? Or does it kick-in after an event has happened and you're trying to determine the probability of certain factors contributing to the happening of that event?

MS. MARJANAC:

Yes, that's right. So it's supposed factual analysis. So after an event the scientists will look at, for example, a rainfall event being perhaps a half meter of rain in (3) days would be very extreme. So essentially that specific event, they defined the event that's occurred. So say that the quantity of rain caused

flood or flooding they define the event afterwards and then they look back at the historical record at how often such an amount of rain fell within in a three-day period, for example. And then they run climate models to see how often that event comes up in the model so that simulates rainfall in that region. And then they can see how likely that event is in the real world, and what the return time for that event is. So how often it's going to occur? And then they compare that against the world without human greenhouse gas emissions so that they can see how the emissions have made that that event more likely.

PANEL CHAIR CADIZ:

But it's a post-mortem determination?

MS. MARJANAC:

Yes, but then there's some predictive elements because, for example, in that study of Cape Town, they ran the same experiment with an additional greenhouse gas emissions and additional warming caused by those greenhouse gas emissions. And so, they have a predictive element because they said well if global mean surface temperatures or temperatures in this region were two degrees (2°) on average warmer, then how does that impact the model? How does that impact the simulation of the drought? And so, you have a predictive impact as a result of that particular study as well. So you have a predictive result.

PANEL CHAIR CADIZ:

I'm having difficulty grappling with those statements. If it's a post-mortem thing, you're saying that the findings, in regard to a specific event made post-mortem, can be used in predicting future events?

MS. MARJANAC:

Because the result shows that…

PANEL CHAIR CADIZ:

No, no… yes or no, first.

MS. MARJANAC:

Yes.

PANEL CHAIR CADIZ:

Alright. Then explain, please.

MS. MARJANAC:

Because the result will tell you how much more. How the likelihood of that event is changing with different levels of greenhouse gas concentrations in the atmosphere. So although the objective of the study is to understand what caused that particular event that's just happened, that disaster that's just occurred, because it tells you more about how greenhouse gas emissions influence that event. You can extrapolate from that how that event will change going forward, and how that event has been made, the likelihood and risk profile of that event is changing through time.

PANEL CHAIR CADIZ:

I'm trying to make a simple analogy in my mind where this nascent science might be applied or analyzed. For example, a plane crash. After the plane crashes, then… investigators come in. They do a postmortem, and then they determine what was the cause of the crash, and they would probably say these are the likely factors that contributed to the crash. But if you apply this as a sort of science for the owners of the company, how does that work? How do I hold the airline company liable or responsible if the determination happens after… I mean, are you setting up a standard where you're telling the airline company that you should have known that these things would happen. Well, it's like what they call "Monday morning quarterbacking" or… please make a distinction between "Monday morning quarterbacking" and this predictive science of event attribution.

MS. MARJANAC:

What does Monday morning quarterbacking mean?

PANEL CHAIR CADIZ:

I'm sorry. I'm very sorry. You know… watching football and then there's so many good analysts after the game... "they should have done this or that"... after results of the game have already been determined.

MS. MARJANAC:

Typically we didn't find in our studies that any company could be made liable for an event. Well, the purpose of event attribution science is to explain and to understand why an event occurred and how humans influence that event, how human emissions influence that event. What it studies is all human released greenhouse gas emissions since the beginning of the Industrial Revolution. It doesn't tell you who released those emissions or whether they would be legally liable for them. That's a totally separate inquiry for which you need to rely on perhaps the evidence of Mr. Richard Heede that discusses who emitted those emissions.

It only analyzes the event that occurred and how all human emissions influence that event. And then our research looked at what this additional information and this improved foreseeability of specific risks might mean for people that need to adapt and prepare for climate change. So if the information is out there that this drought, for example, is more likely to occur, then, one might expect Water Authority in South Africa to prepare for that event to make sure that it has enough water to be resilient. And we've said that if it knew that this increasing drought risk was increasing at this exponential rate, this rapid rate, then, under a number of legal theories that people who are affected by that drought might expect or try and hold that water company for example liable for failing to provide them with basic and essential services.

PANEL CHAIR CADIZ:

Okay. Going back to my analogy about the airline company… so, I'm sorry if I take time here because... part of the Petition is really finding responsibility of the Carbon Majors, although, as I said earlier, as a side note, that we do not have the jurisdiction to award damages, being a Human Rights Commission and not a court... but we have the mandate to determine responsibility and make it known to the public, if the evidence so are.

But, anyway, going back… So you're saying that this new science of attribution is stable enough and its methodologies have been validated, and confirmed, and supported by the scientific community, because it has been elevated to a certain level of certainty? Its findings, although not absolute, may be used as a standard against which the behavior of corporations can be

ranged against or evaluated, and may be the basis of a finding of negligence or lack of due diligence?

MS. MARJANAC:

No. I don't think that's quite what I'm saying. I think that the science is simply trying to explain what is happening in the physical world and how human greenhouse gas emissions are changing events. The liability question is totally separate and would depend on what kind of case one was trying to bring. So the science just sits on its own that's just additional information that the scientists have put out there; and we extrapolated generally about what that might mean for the future, looking at liability. So because that information is now in the public domain, one might expect that people, infrastructure managers, and others ought to act on that information to try and protect people from those reasonably foreseeable risks.

So in terms of the liability of the Carbon Majors for their historic emissions, I think that's a separate sort of question to what we really focused on in our two (2) papers which was potential liabilities for future events going forward. Where people don't and those actors with duties don't adapt and don't become more resilient and don't prepare for these worsening weather events. The sort of backward looking liability was touched on in the article but it wasn't really a focus of the article. And so, to that extent, whether it's a standard, I think that this science is one relevant factor that ought to be taken into account by decision-makers and people that do have duties to, for example, disaster risk managers ought to be looking at this science and incorporating it into their decision-making processes. And that's the kind of negligence claim that I was referring to in the evidence.

PANEL CHAIR CADIZ:

Alright. I'm going to proceed to a different area of your discussion.

Were you implying earlier that one of the climate change financial risks faced by the Carbon Majors today includes litigation risks… damages that might need to be paid by these companies in the future… arising from climate change litigation?

MS. MARJANAC:

Yes, that's right. That's the third category of risk that was referred to in the Bank of England's report and in fact some of the responding companies, many of the responding companies to this Petition actually disclosed that risk to

their shareholders in their annual reports. And particularly in the last twelve (12) months because there's been such a wave of tort claims in the United States the companies have actually said to their shareholders, "There is a risk that we could be found liable in some of this litigation and have to pay out for our past historic emissions." So they do recognize that, that is a financial risk to their companies.

PANEL CHAIR CADIZ:

And you also mentioned earlier that this is part of the financial risk… non-litigation cost, the financial risk of investors migrating to other more climate-friendly companies. For example, Carbon Major A has its own set of investors and Carbon Major B, who might be more mindful of environmental friendly programs, might attract the investors from Carbon Major A, and that is a financial risk also? I was just imagining… migration of investors from Company A to Company B, simply because Company B is perceived to be more climate-friendly or environment-friendly?

MS. MARJANAC:

Yes, I think that that is a possibility and I think that perhaps that does happen amongst some in the investment community who have analyzed the risk associated with these companies and have made decisions to exclude certain companies based on those risks. So there are some investors who undertake an integrated approach to considering ESG issues and other materially financial issues and some of them, too, would, I think, exclude certain companies from their holdings based on various climate related factors.

PANEL CHAIR CADIZ:

Even if it meant an immediate reduction in the short-term on their return on investment. For example, shifting my shareholdings from A to B might mean a ten (10) percent reduction on the profit of my shares in the near future, but if you're thinking long term… less risks.

MS. MARJANAC:

From my understanding, I'm not an investor, but from my understanding it is possible to make equivalent and sometimes greater returns with portfolios that do exclude certain high carbon stocks. But there may be those investors who take a more explicitly ethical approach and who may accept sacrificing returns as a consequence of excluding certain types of companies.

PANEL CHAIR CADIZ:

Yeah. As a matter of fact, I think I came across a study in one of the Scandinavian countries where this was the finding. Millennial investors were willing to sacrifice shareholding profits if it meant protecting the environment. Anyway, that's just a side comment.

Are there other questions? Okay. Commissioner Pimentel?

COMM. PIMENTEL-GANA:

It just entered my mind while they were talking about examples. Bringing closer to home, the Typhoon Haiyan, can you apply attribution science to it because it's already happened? And you can now answer the question how has climate change made this event stronger or more likely to occur again? So can we, by studying Typhoon Haiyan, come up with recommendations as you said for policymakers, and, maybe, risk managers to actually take into account what happened in Typhoon Haiyan and applying attribution science. Is that possible? Is that how it is done?

MS. MARJANAC:

I think that's possible and so the study that was manifested today with my evidence did look at the storm surge and specifically examined how Haiyan occurred and the drivers and the way that that storm evolved and its impact. So I think that, yes, theoretically, that is possible but that one study is the only one that I found on Typhoon Haiyan.

COMM. PIMENTEL-GANA:

I was just following your discussion on attribution science. I'm just trying to understand it also. Okay, thank you.

PANEL CHAIR CADIZ:

Father Walpole.

DR. WALPOLE:

May I just clarify on this because this study is, I understand, of great importance. It identifies statistically what the opportunities are. Now, it's another thing to turn around and apply attribution. That's what will be taken up by other areas of research but what came out of this is that if we are concerned about this problem in the Philippines, typhoon Haiyan was twenty percent (20%) greater than it would have been without the greenhouse gases. So what this science is doing is taking out the greenhouse gas and showing what the impact, how that impact would have been reduced, yeah? So it can't do it in one sense before the science but you're also showing in that study which is a statistical analysis which many people in the world won't accept– that if we go to two degrees (2°), it then is six (6) times more likely to occur. Was that it?

MS. MARJANAC:

I think that kind of technical conclusion might need to be taken up with the authors of that study.

DR. WALPOLE:

Yeah.

MS. MARJANAC:

Because I'm not quite sure how they, how exactly the modeling works in that case and whether there is that sort of relationship.

DR. WALPOLE:

Yeah. Okay so we go back to the research program. But that is its projection within a range I assume of probability.

MS. MARJANAC:

When one assumes the implication may be that as greenhouse gas emissions increase, that these the intensity would also increase. But that they would need to confirm that because I'm not sure about the dynamics of that one.

DR. WALPOLE:

And then, where it has to be taken and worked out in terms of a more global question of accountability, yeah? So you're moving from one area of geophysical, biophysical analysis, to statistical analysis to another realm if you like.

MS. MARJANAC:

So these I should point out that this kind of evidence has not yet been used in litigation. I think that in the U.S., the city of San Mateo did mention of an attribution science in in its pleadings, but I'm not aware of any other active litigation that has tested this new science.

PANEL CHAIR CADIZ:

Commissioner Dumpit?

COMM. GOMEZ-DUMPIT:

Maybe if we can invite the scientists who did the simulation just to be able to understand the science around it because it's quite significant that we can draw from what they have found out that if there was no greenhouse emissions it would be twenty percent (20%) less in terms of intensity and perhaps the damage that Haiyan caused would probably be a lot less as well including the lives that were lost during the typhoon and then after the typhoon as well. Because that has to be counted as well, not just during the time that the Philippines was being hampered by this monstrous typhoon but after. That's the problem as well. And that the loss of lives after the typhoon would certainly be also a direct cause of the typhoon itself. And then, of course, to add to that is really the fact that we are already vulnerable, the poor are already vulnerable. So maybe we can contact the people behind this study.

PANEL CHAIR CADIZ:

I take it as a suggestion from Commissioner Dumpit to the counsels for Petitioners… if you can present an expert witness, a scientist himself or herself, who is in the practice of the science of attribution… That might be helpful.

ATTY. MAYO-ANDA:

Thank you for the suggestion, Your Honors. We will confer with the team and the Petitioners and we will endeavor to respond to that request.

PANEL CHAIR CADIZ:

Yeah, but I think separating the discussion of the science of attribution… sufficient evidence has been presented. Forget about attribution for a while… climate change has, in fact, increased the frequency of extreme weather disturbances, occurrences, as well as the intensity, which definitely impacts human rights.

Are there other questions? Dr. Walpole? No more?

We would welcome interventions from other witnesses and resource persons behind counsels, because I see that there's a robust discussion going on.

ATTY. MAYO-ANDA:

Can we excuse the witness first?

PANEL CHAIR CADIZ:

The witness is excused.

ATTY. MAYO-ANDA:

Thank you, Ms. Sophie. Your Honors, please, you raised an important point. We would like to recall to the witness stand to clarify certain points, Mr. Carroll Muffett in relation to the line of questioning that you actually raised a while ago.

PANEL CHAIR CADIZ:

Is that all right, Mr. Muffett? Okay, you've been sworn already yesterday, and you're still under the same oath.

MR. MUFFETT:

Thank you, Mr. Chair and members of the Commission. I wanted to add a few additions to Sophie's outstanding testimony in response to questions that rose in your follow-up conversations. As you alluded while the science of climate attribution is a relatively new science, though as Sophie attested one where the methodologies are increasingly agreed as robust and sound, it follows on similar sciences that are very well established. And you gave the example of an airplane. You know, that's actuarial science. Actuarial science has been used for more than a century by insurers and others, and you know it begins with a baseline assumption. We know this is the foundation, this is what the world looks like and says this is what the world looks like with the addition of this new factor. This new factor makes it more likely, more intense, that's the change. And so that approach, that scientific approach to assessing changes in risk and its assessing changes in damage is quite well established and well respected in a variety of fields.

The one that is most analogous is, in fact, the field of epidemiology where the same science applies. Where there is an understanding here of what our natural baseline is, and with the addition of this insult, with the addition of this toxin, or this harm these consequences are X percent more likely or X percent more severe. And that is what we are seeing in the context of climate attribution– our understanding of the natural baseline, our scientific understanding of the natural baseline is now sufficiently robust and sufficiently agreed that we can then look at and calculate this insult, this harm has changed the baseline in this way, in the same way with we would say the addition of this toxin has made this disease or this harm this much more likely or this much worse.

And I think this analogy to epidemiology is important in another way. And this goes to the point that Sophie made that climate change made the storm surge in Typhoon Haiyan twenty percent (20%) higher. Now, we know from epidemiology that twenty percent higher (20%) or twenty percent (20%) more of something doesn't necessarily mean that the impacts are only twenty percent (20%) worse. Well, you know, in classic toxicology, there is an assumption that the dose makes the poison. That the harm increases incrementally with the exposure. But what we find in epidemiology increasingly and certainly in the climate context is that risks are non-linear. And I'll give you an example from the experience of New York with its own hurricane. The difference in the storm surge there of just a few millimeters made the difference between the storm washing into the streets and flooding into the subways and causing billions of dollars of damage. In the same way, if you look at the impacts of Typhoon Haiyan, that difference of twenty percent (20%) might have been the difference between the storm in one area wiping out a community garden or wiping out a school. So those differences of millimeters in terms of height can be measured in terms of massive loss of

human life or massive loss of property. And so, this is one of the things that I want to highlight is that, the climate is a case in which the dose does not make the poison.

Small differences in the percent in the height of the surge or in the strength of the winds can make profound differences in the scale and scope of the harm. And that brings me to the final point that I want to make, that is again analogous to toxicology and epidemiology, is that the law has now become very comfortable with allocating responsibility based on the increased likelihood of a harm or the increased intensity of a harm and so where a drug or a toxin has been shown to make the occurrence of a harm more likely, courts have become very comfortable in allocating liability and responsibility on those grounds. And so we feel we have established these harms were foreseeable even if they're precise degree was not foreseeable. You know now that the harms that have been experienced are the foundations for saying, by making this storm more likely or more intense, we have a foundation for holding you as a company responsible.

The final point I would make is obviously one of the breakthrough studies that I alluded to in my own Statement was led by Dr. Brenda Ekwurzel of the Union of Concerned Scientists who demonstrated precisely how extreme climate events can be and are being attributed to the Carbon Majors themselves. And my understanding is that Dr. Ekwurzel may be on the invite list for a future hearing and I think she'll bring profound expertise.

PANEL CHAIR CADIZ:

Thank you very much for that intervention.

Counsels, do you have other matters to bring up?

ATTY. MAYO-ANDA:

Yes. Thank you Carroll. We just would like to respectfully manifest, Your Honors, that all the statements where the witnesses have actually put their signatures are original. So they have all the documents with the Honorable Commission, have the original signatures of all the witnesses and also we confirm that Dr. Brenda Ekwurzel will be a future witness.

PANEL CHAIR CADIZ:

Future… in New York? In London?

ATTY. MAYO-ANDA:

Yes. New York in the September hearings, Your Honor.

PANEL CHAIR CADIZ:

September 27.

ATTY. MAYO-ANDA:

Yes.

PANEL CHAIR CADIZ:

Was that part of your manifestation… submission already?

ATTY. PAUDAC:

Not yet, Your Honors. But we already have spoken or communicated with Dr. Brenda of the Union of Concerned Scientists, also a colleague of Dr. Peter Frumhoff. So we will endeavor to present on our New York hearing, Your Honors.

PANEL CHAIR CADIZ:

Okay, so we look forward to hearing her testimony.

Are there other matters, Atty. Fernandez, before we close?

CLERK OF THE INQUIRY:

Your Honor, we have provided the dates and the venues for all the succeeding hearings through the Facebook page of the Commission on Human Rights as well as through other means such as advisories. We have also sent out the notice of the fourth round of Inquiry hearings to be conducted on 27 and 28 September in the Continuing Legal Education room of the New York City Bar Association at 42 West, 44th Street, New York. All questions and inquiries may be sent to nicc.chrp@gmail.com. That is all, Your Honor.

PANEL CHAIR CADIZ:

Alright, it's been a long but fruitful day. If there are no more matters to be raised by any of the Parties, we will call this Inquiry to an adjournment. Thank you very much.

[Bangs gavel]

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