

ICAS Expert Voices Initiative Interview - Mr. André Aquino - May 2023

ICAS Blue Carbon & Climate Change (BCCC) Program



Watch the Full Interview (YouTube): www.youtube.com/watch?v=HrxwpCZghqA

About Mr. André Rodrigues de Aquino: www.worldbank.org/en/about/people/a/andre-rodrigues-de-aquino

About the ICAS Expert Voices Initiative: www.chinaus-icas.org/media/expert-voices-initiatives/

EXECUTIVE SUMMARY

On May 25, 2023, the Institute for China-America Studies (ICAS) Expert Voices Initiative (EVI) conducted an interview with Mr. André Rodrigues de Aquino, a Lead Environmental Specialist from the World Bank, on the theme of “Cooperation Between Developed and Developing Countries on Blue Carbon Projects.” The interview was hosted out of Washington, D.C. by Zhangchen Wang, ICAS Blue Carbon and Climate Change (BCCC) Program Research Assistant, while Mr. Aquino spoke remotely from Jakarta, Indonesia.

During the nearly one-hour interview, the host asked Aquino for his views and insights on issues regarding blue carbon damage and degradation in developing countries, challenges facing blue carbon protection, the sustainability of blue carbon development, and the future of blue carbon projects. Aquino responded to all the questions of interest that ICAS and its global audiences submitted while sharing his insightful assessments and valuable experiences. Through this interview, the audience can have a deeper understanding of the current status of blue carbon protection in developing countries, especially in Indonesia, where Aquino resides. Additionally, Aquino talked about the protection and development of blue carbon ecosystems in general, especially mangroves, in developing countries, the problems they are specifically facing, and potential solutions to those problems.

Aquino first described the conflicts of interest encountered in blue carbon ecosystem protection.

- The economic development needs of coastal residents often have a negative impact on the blue carbon ecosystem. For example, the shrimp farming that many coastal communities rely on could incidentally have devastating effects on mangrove forests.

Aquino then talked about the serious consequences of blue carbon degradation and proposed some solutions to reverse the situation.

- A number of coastal communities in northern Java, Indonesia, had to relocate their entire community further inland specifically because of the loss of local mangroves.
- Luckily, through the Mangroves for Coastal Resilience Projects and other similar programs, Aquino's team at the World Bank and many other working groups are gradually reversing the worsening trend of blue carbon ecosystem degradation.

Next, Aquino was asked about the challenges facing blue carbon protection and restoration projects. He divided challenges into three major categories: technical challenges, funding problems, and social issues.

- Regarding technical challenges, he mentioned that restoring the natural conditions in which mangroves and other blue carbon ecosystems can thrive is very difficult. Many developing countries do not yet have adequate technical support, and Aquino believes that technical problems can only be solved by attracting more funds to invest in blue carbon projects.
- To raise more funds, he believes that there must be more incentive policies to attract developed countries and countries with surplus funds and technology such as China to participate in these projects.
- On the question of whether a global financial institution like the World Bank is the best solution to the problems of funding, Aquino suggested that there is no one best solution and that money from different levels—international, national and private—should all be encouraged to participate as circumstances differ with each region.
- In terms of social issues, Aquino said that one of the biggest problems is that the need for mangrove protection often conflicts with the normal life of local communities since many communities sit within planned conservation areas.

Following that, Aquino was asked about his opinion on the role of sustainable development.

- He suggested that blue carbon must generate its own commercial value in the future. Only in this way, Aquino explains, can the blue carbon protection works get rid of external dependence and start to develop in a sustainable way.

Last, Aquino explained that he is generally optimistic about the future of blue carbon protection.

- He said that as more and more countries and people—especially the new generation of young people—start to pay attention to these issues, blue carbon development will definitely have a brighter future.

TRANSCRIPT

Interviewer: Zhangchen Wang - Blue Carbon & Climate Change (BCCC) Program Part Time Research Assistant, Institute for China-America Studies

Interviewee: André Rodrigues de Aquino - Lead Environmental Specialist, Sustainable Development (SD) Program Leader for Indonesia, and Timor-Leste, World Bank

This interview was conducted by ICAS EVI on May 25, 2023 (EDT) via Zoom.

Note: This transcript, the text verified by ICAS staff using the full video recording, was created with the full intention to stay true to the direct words and meanings of the speakers while being formatted in a comprehensible, helpful manner for the audience.

Zhangchen Wang: Good morning. Good afternoon. Good evening to our global audiences. My name is Zhangchen Wang. I'm a Blue Carbon & Climate Change Program researcher with the Institute for China-America Studies. The Institute for China-America Studies is an independent and non-profit think tank based in Washington, D.C. And today we are having an expert voice initiative, also known as EVI. It is a series of on-camera sit down interviews with leading experts on important issues in the U.S.-China bilateral relationship. Today's EVI is hosted by the Blue Carbon & Climate Change, also known as BCCC Program. You can find more information about both the EVI and the BCCC on our Institute for China-America Studies website. So today we are delighted to have Mr. André Rodrigues de Aquino to join our discussion, and we will talk about the cooperation between developing and developed countries on blue carbon projects.

Mr. André Rodrigues de Aquino is the Lead Environmental Specialist, Sustainable Development (SD) Program Leader for Indonesia, and Timor-Leste at the World Bank. He is currently based in Jakarta, Indonesia. Mr. Aquino has almost 20 years of experience in natural resources management and environmental issues. You can also find Mr. Aquino's bios on our website too.

So very welcome to our discussion today Mr. Aquino. We're very delighted to have you today.

André Aquino: My pleasure. Nice to be here. Thanks.

Wang: Okay. So I would like to start today's discussion with some more general questions. So I think the importance of blue carbon needs no further explanation. So we are sitting here today with the consensus that blue carbon plays a very important role in carbon sequestration and the protection of coastal environments. Unfortunately, I think today the international community has not yet paid enough attention to blue carbon. So I just wanted to start today's conversation by talking about the consequences of not protecting blue carbon. So based on your experience, Mr. Aquino, how serious is the problem of blue carbon degradation in, especially developing countries, specifically Indonesia, where you spend most of your time?

Aquino: Great. So thanks again. Very excited to be here and address your program. So maybe just to kick us off some clarification on terms. What I will be speaking about when I talk about blue carbon, right? Basically, the way we have been trying to conceptualize this here at the World Bank, blue carbon refers to mangroves, so coastal forests, right? The tropical coastal forests and seagrass, which are marine ecosystems, much less known than mangroves, but holding significant amounts of carbon. So as you said, I think the importance of these ecosystems do not need to be reemphasized. But I think it's important to say that blue carbon is "carbon". That is not something different than carbon in forests, for instance, right? But in this case we are talking specifically about coastal ecosystems. And the reason why I pre-phased that, that is because I think that the answer to your first question is general. I think carbon in biomass is living biomass, right? Where the forests or in the oceans is critical and we are losing a lot of it, which is going into the atmosphere.

So blue carbon, just like forests in general, tropical temperate forests, are critical to maintain our climatic balance. Mangroves are being lost around the world, mostly because of conversion to other land uses. It has been the same here in Indonesia. It was the same in Brazil, for instance, mainly for shrimp cultivation. So aquaculture of shrimp. So as you can see here, there's an element of global demand, right? So as it is the case with a lot of environmental degradation and or habitat conversion issues, here we have a market problem. So you have a price for shrimp, you'll have returns for shrimp farming, and you do not have that for standing mangroves or you have less, right? Particularly market value, you have less. And then the result of these is conversion for other land uses. And another cause of loss of mangrove...and I'll speak a lot about mangroves, less than...less about seagrass. Most of carbon is really mangroves. They are the cause of loss of mangroves, these urbanizations, conversion into infrastructure and so on. So these are, like, some of the important causes of mangroves loss. Thanks.

Wang: Yeah. It's obvious that there has been conflict between our modern developments and the protection of blue carbon or all kinds of ecosystems. So I'd now like to ask a follow up question, which is, based on your experience, after all these losses, after all these conflicts, what are some of the consequences? So what will happen after losing all these low carbon ecosystems? What's the impact to our daily life? Like we have to convince people because we are not interacting with blue carbon trading. How do we convince them that this is an important issue?

Aquino: I think looking at some pictures of the coast of northern Java. So Java, here in Indonesia. And it gives us ample reason to act and act quickly. So you have a number of coastal communities that have had to relocate their whole lives, their worship places, their cemeteries, their schools, their lives further inland because of loss of mangroves. So basically, you had significant removal of mangroves in the coast, in the northern coast of Java. Now, compounded with the effects of climate change, including sea level rise, you really have this dramatic situation where people cannot live in their homes anymore. So I think, I mean the whole scale degradation, infrastructure loss, livelihoods loss is a very strong dramatic effect of mangroves loss. In addition to these and more globally, loss of mangrove contributes to emissions of greenhouse gasses with the consequences we know, right? So add to climate change and you have biodiversity loss.

You have some species that are adapted to live in the mangroves. In Indonesia, for instance, we have the proboscis monkey. I think for our listeners it'd be nice to just Google it—proboscis monkey. It's a pretty amazing primate that lives only in mangroves forests, right? You have birds from mangroves. So the loss of mangrove leads to the loss of some of our key species with, again, all the consequences of biodiversity loss. One more thing very important for fishing nations like Indonesia, loss of mangrove causes loss or reduction in productivity of fisheries, commercial fisheries. Many of the commercial fish that people, companies, fish at some stage of their life or their life cycle, they spend time in the mangroves. Either they spawn, they grow, they are protected in mangroves. So we used to say that mangroves are fish nurseries, they nurse fish. So another consequence is a decline in fish.

Wang: Thank you. Thank you for your detailed observation and explanation. That's indeed, it sounds like a tough situation. So then we need to move to our next important topic, which is protection. Obviously, there needs to...something needs to be done to protect those beautiful habitats and essential and critical habitats for the earth and for us. So can you provide us with some examples of blue carbon protection projects, especially in developing countries and also, like I, we noticed that you're also working on a program called Mangroves for Coastal Resilience Projects in Indonesia. Can you also give us more detail about the programs? What's your assessment on these types of projects? Do you think they are successful at the moment?

Aquino: Oh, right, yeah. Thanks for giving me the chance to talk about our mangroves work. Mangrove Coastal Resilience is a very large project. It's very ambitious.

So Indonesia has the largest mangrove coverage in the world. It's the country that has the most mangroves size and also richness [in] species. So it's really ground zero for mangroves. And the World Bank, we have partnered with the government of Indonesia to provide funding, large scale money for mangroves conservation and restoration. So for our listeners, restoration here we are talking about basically bringing back mangroves where they have been taken out or improving the quality of existing mangroves. So let's say you have a mangrove area that has been degraded, trees have been cut, the hydrological flows have been deteriorated...so restoration means bringing that back as much as possible. So this project is being implemented by the government of Indonesia and it has a very ambitious goal of restoring, bringing back 75,000 hectares of mangroves. That's the largest attempt in the world to restore mangroves.

How? How are we doing this? How are we planning to do this? It's fundamentally by working with local people, people that live close to the mangroves. It is about giving them incentives. It is about involving them in caring for and bringing back these mangroves. And this involves basically providing livelihood opportunities or business opportunities around mangroves. In Indonesia, people have been very creative in using mangroves for different purposes, even painting. I mean, you have some paints that can be extracted from mangrove seeds and in the fruits. Fisheries. Tourism. People love walking around the mangroves. So this project seeks to involve people, communities, local governments in protecting and restoring mangroves at a very large scale. I think the point about scale here is very important.

And you ask me about projects around the world. There are many, there are many. There are many initiatives, initiatives with one community within one city or one village. And we have very successful initiatives in places in Africa particularly. I mean, there are some initiatives in Senegal that have been quite, quite successful. But the challenge of doing this at scale, not one community but 500 is big and that's what we are working with the Ministry of Environment and Forestry of the Republic of Indonesia to try to solve.

So that's a little bit I mean, there's much more here. There's blue carbon, but in a nutshell, that's what we are trying to do.

Wang: Thank you for your very detailed, clear explanation of what's going on. Obviously...definitely, we need to get more people involved. We need to give them incentives and provide them with funds. But...so...after that I still like to learn a little bit more. Because you, lastly...you mentioned challenges. One of them is how to bring people together in all this, all of the communities. So I believe, I suppose there are also other challenges. So are there any challenges you are facing in these projects, are these projects facing? And what's your biggest concern at the moment?

Aquino: Yeah, by all means. I mean, there are...there are many challenges. I spoke about the scale challenge, involvement of communities, but there are technical concerns. The restoration of mangroves has not been very successful around the world. I talked about good, good examples, but there are a lot of attempts that have not met the objectives. It's difficult. It's difficult because...I mean a little bit now on the technicalities, right? It's difficult because mangrove...you can imagine, I mean, they grow in, under very specific circumstances, right? Mangrove forests, you only have them in the intertidal zone, so where the tides come...so it cannot be too dry. It cannot be too wet. So you can imagine it's a very narrow strip of land in tropical countries. It cannot be directly facing the oceans where you have too much mechanical forces. Right. Because basically that washes away your mangroves.

So recreating the conditions where mangroves can thrive is difficult. So technical. You have a silviculture problem. So a forestry problem. Not all species of mangroves are easy to propagate. You cannot reproduce them. Some of them are very easy as a genus called *Rhizophora*. *Rhizophora* is easy. But then you have others. They are much more difficult. So there is the challenge of not only restoring mangroves but restoring the right type of mangroves with the diversity that you would normally have.

There is a social difficulty. Coastal areas in populated places like Indonesia are places where you have a lot going on. There's a lot of interest happening there, right? It's not like land that has been sitting there waiting for something to happen, right? You have a lot of things happening. You have fisheries happening. You have these structures. You have trade, right? So often, there is conflict over land use in coastal areas. And for you to restore mangroves for some years, you need to let that place be protected, right? So you cannot be having a lot going on there, right? So as you can imagine, also, that causes problems to some people, particularly those whose livelihood comes from the mangroves. So there needs to be some sort of way of compensating or restoring the livelihoods of these people while the mangroves are being restored.

And one last thing, and this is maybe a very Indonesian issue, but I don't think so. I think you have these in other places, too. There's the issue of unclear land tenure, right. So sometimes it's not very clear who is the owner of that land, that piece of land. Then it's hard for you to engage the right people because it's not...it might not be clear who is their lawful legal...land holder. So you see, there are many layers. It's not about only planting trees. There is the whole lot behind it. Thanks.

Wang: Yeah, indeed. That's not easy. Yeah, we do face a lot of problems. They have technical difficulties, they have the social problems, and also money related issues. But then let's spend the next 20 minutes or so to discuss what we can do to deal with these problems. Why don't we start with talking about addressing the technical issues so we know that there are developed countries or countries with more advanced technologies that can do better in terms of the protection of blue carbon. Do you think that these countries can work together with countries like Indonesia or other countries as it needs these tech... technical supports? How can we create, like, maybe, a win-win situation for blue carbon protection among those countries? What's your opinion on this?

Aquino: Yeah. By all means I think here we need all hands on deck. So collaboration is the word of the day. So I think here we have funding, technology, technology in knowledge, right? In markets. And let's talk a bit about each.

Funding. Funding is key. I mean, doing everything and all that I said here will take a lot of money. Now, the government of Indonesia is borrowing money from the World Bank to do this, right? That's not very common. Not many countries are ready and willing to do that. So, I mean, kudos to Indonesia. But even the funding we are mobilizing right now will not be enough. So there needs to be more. So first is the decision about mobilizing funding. How? Well, long, long discussion. So, is mangrove a climate solution? So let's use climate funding. So then this takes us to the discussions about, well, let's make sure that the pledges for climate funding are made true, right? Increasing the overall funding available for climate. Now, the, of course, I mean, the needs are so big. Mangroves is one among a sea of needs, right? But at least if you have more funding in the system, some of it will come to mangroves.

Then there is the issue of blue carbon, blue carbon itself. I mean, normally when we talk about blue carbon, we are talking about carbon payments, right? Carbon markets and things like that. And we can discuss this a lot. That's my background. Carbon market, and yes, they will play a role, but I think we need to be careful not to put all of our hopes in blue carbon payments because of many difficulties with carbon in general, right? There's a lot of expectations, I would even say maybe hype about carbon payments. But when we go look really and the

concrete experience is not so many. I mean, again, if you...if you ask how many blue carbon projects you have around the world, it's not a huge amount right? But...so funding is one area.

Then technology. Here I think we could do very interesting things, you know, like, mobilizing the best technology to determine where to restore. And this is something where our knowledge has increased a lot, right? I...using remote sensing to know like in real time where we are losing mangroves or where the most suitable conditions for mangrove restoration are? Doing this in a dynamic fashion because the coastal areas are very dynamic. Right? Then you have sedimentation happening... So technology about planting, I mean, can we then join hands to develop new techniques to restore our mangroves quicker and at the larger scale? Can we develop new technologies for propagating all these different species of mangroves? Right. So I think here having like a joint program of research, it could be very, very useful. I think. I mean, that's something you guys could help posterity.

Then, markets. I mentioned at the beginning that to a large extent mangroves have been the forests because of demand of shrimp. A lot of the shrimp being exported. It exported it where? I do not know. But having policies in the buying countries, right? That favor sustainability can go a long way also in sending the signals that continued deforestation for commodity production is not good business. That's something, in my opinion, maybe you the institutes, right, could explore more because a lot of these actually goes to China, right? So to what extent could there be more movement in the Chinese market to ensure the traceability of what they are purchasing? And ensure sustainability. And of course, I mean, that's way beyond mangroves, right? The meat that goes to forests, palm oil, soybeans, all of that, right? I think this is a very important agenda item. So as you can see a lot of countries need to collaborate on.

Wang: Okay. Yeah. Thank you for your insightful observation. Yeah. We got the problem of funding. We need to do more. We got to again, technology where we can cooperate as well. And then marketing issues where we can make something out of the blue carbon. Why don't we jump back to the funding issue a little bit? So I think money is a big problem for not only blue carbon. That's all kinds of climate issues. So we have all kind of...the leading, not only governmental officials but also experts, talking about how we need more money, we need more funding for these issues. Luckily, during last year's COP 27, we had this great, historical Loss and Damage Fund, which is designed to assist developing countries face crises brought by climate change. But on the other hand, we also have the critiques that these kinds of Loss and Damage Fund are just so-called empty baskets that does not really have an actual impact on addressing climate issues. So I'd like to hear your assessment on these kind of multinational cooperation as allocating funds for blue carbon, and also other climate programs.

Aquino: Yeah, look, I don't know much about the Loss and Damage Fund, specifically, so I cannot comment on that. But as I mentioned, climate finance in general, the 100 billion annually of pledges for climate mitigation adaptation has not yet been fulfilled. So that is an important potential source of funding for blue carbon. And so, yeah, I mean, this is under the UNFCCC as well as the Loss and Damage Fund.

There are...there are many windows right now of how climate financing is distributed, but in general, growing that type of funding is key. But again, it's not going to be enough. So it is very important to mobilize domestic funding. It is important to mobilize the carbon markets in all this...I mean, climate financing alone, the traditional climate financing, ODA, official development assistance, is not going to be enough, not for blue carbon, not for tropical forests, not for biodiversity loss.

So the issue about the large scale funding is enormous and private sector capital mobilization is key. And again, I think emphasizing this is very important. The funding to restore is...we will need a lot of funding to restore, but we need to concentrate on stopping the losses first, right? So it's more cost efficient for you to avoid the problem, then remedy it later. Moreover, we cannot ever remedy it completely, right? I mean, when we restore a mangrove,

it's not going to be the same as it was before in terms of its ecological...ecosystem functions. So funding for the maintenance of existing ecosystems, including blue carbon, is fundamental. And again, climate funding is a key part of this.

Wang: Indeed, that's a very sensible assessment. So, basically, two parts. Firstly, we always need more funding or more money to be spent on this. And secondly, we need to do more protecting than restoration after everything is already damaged. So, to follow up, that's...actually I have two questions. So let's start with the first one. Since you talk about we always need more money, so maybe we should be looking at the different channels of funding. So since you are from the World Bank, do you think that financial institutes like the World Bank are actually a better solution to developing countries in terms of financial support? And also you mentioned earlier there has been money invested in Indonesia in terms of blue carbon protection. So can you also give us some maybe successful examples of the World Bank in developing countries in terms of financial support?

Aquino: Okay. So the World Bank, well, the issue of climate change is...is a critical issue for the World Bank. The World Bank has been ramping up its activities to address climate and making more funding available for this. We have cooperative commitments on how much funding we need to allocate for climate actions and that is increasing, right?

So at present we are the largest funding source for climate actions around the world and we do this by mobilizing several sources of funding. So there's funding from the World Bank itself, IBRD. So IBRD concessional loans, we mobilize IDA. IDA is International Development Agency grants or concessional loans. We manage grants from other donors through trust funds and we are also very active in carbon markets. So, we try to...we try to establish large scale funds that pay for carbon credits, not really carbon credits but emission reductions more generally. So the World Bank has been trying to tap into a very different source of funding to mobilize additional financing for this topic.

Now, I mean more broadly, right? What other financial institutions can do. One thing I believe is very interesting and has a lot of potential is the domestic institutions, is mobilizing funding from domestic banks and pension funds. Indonesia has a very sophisticated large financial markets, right? So mobilizing part of that financing for this goal is very important. And we have been working with the government to look into that.

Now, I think a key overall question today is...is how can we monetize the ecosystem services that mangroves provide. And carbon is the one that is most advanced right. So blue carbon is the one that is most advanced, but it's not only blue carbon, right? I mean, there's also biodiversity, there's fisheries. I mean, there are some interesting discussions about how the fishing industry could provide some funding for mangrove restoration. I mean, these are still theoretical, but these are these are possibilities. So I think the funding from the World Bank is not only like to find these direct activities, but it needs to be used in a strategic way to mobilize more funding, right?

Wang: Okay, thank you. Just to follow up this question, you mentioned there's not only the financial institutions, also domestic or, for example, fishery, more subnational, not necessarily on the national institutions that also support these kinds of protection or development. So do you think that the actions from subnational levels can also contribute more to this protection? Or do you expect, like, them to facilitate a multinational corporation? Because, for example, there are higher education institutions, there are private companies from China, from, for example, Australia, also studying blue carbon. And they have the incentive to actually...to do more and some of the private companies also have the incentive because they need something like, for example, carbon credits. So do you think that these kinds of subnational activities are also helpful in terms of a multinational corporation?

Aquino: Okay. So if I listen to your question correctly, on one side, we're talking about subnational governments like provincial state level, city action. And then, on the other side, we're talking about private sector engagement, right? Yes, I think both are critical. Subnational government is key. These projects that I mentioned here in Indonesia is...it's initially going to be implemented in four provinces in East Kalimantan, North Kalimantan in Borneo Island, and then in Sumatra in the Riau in North Sumatra provinces, right. The role of engagement communities is critical for the success of mangroves, of blue carbon activities. In subnational governments are the ones that can make that happen, right? That can foster, that can enable that. So their role in coordinating and engaging the stakeholders around mangroves is critical, fundamental. We spend a lot of time on this here in Indonesia.

One of the things that the government of Indonesia is doing is the establishment of provincial level mangrove coordination bodies, that brings all the different stakeholders that have a stake in mangroves, the fishing industry, mining, offshore mining, agriculture, aquaculture communities, right, to discuss these issues...so critical is their engagement.

On the company's side. Yes, I think that's the...that's where things are moving, right. I mean, it's the increase in engagement of these corporations in funding. But I think here we need to differentiate what's happening because there's so much happening. And it is a bit confusing, right? Corporate social responsibility is one thing. Carbon credits is something else. Investment is yet something else. And I think there is a space more or less for everything here. But they're very different, right?

So one is, let's say investments. We could imagine private sector investment in mangrove restoration. And I think this is something extremely exciting. So you could imagine the financial sector, banks providing funding for restoration. Now, who pays this back? Well, you could imagine that the communities or private sector that is restoring would pay back if the restoration generates money in the future, right? And then this becomes a little bit of a technical problem. We are looking into these as well. How can you restore mangroves but still do shrimp, for instance? We call these silvi-fisheries, right. Silviculture-forestry-fisheries. If you have a restoration that is productive, then you can unlock commercial financing streams, right? And then the role of the financial sector is key. So very important. That's one.

Second, carbon credits. Yes, we talked about it. We talked about it, that there is potential. But the regulations for carbon credits in countries like Indonesia are not clear yet. That's a whole new conversation. But one of the concerns that countries have is if they sell these carbon credits and they have their own domestic obligations of reducing emissions in the case of Indonesia, they have the obligation, the commitment to the international community, to the UNFCCC of reducing up to 43% of their emissions. It's ambitious. And if they sell this carbon, do they need to deduct this from their inventory?

Well, if that is the case, then they have a problem because now it's more expensive for them to reach that target, right? So countries will be very careful about allowing companies just to buy carbon credits. Here in Indonesia, I don't think it's going to happen that easily. Right. So now you have the voluntary carbon market. That's different because it does not generate an obligation for the country. Okay, then. Good. Let's do that.

And finally, you mentioned corporate social responsibility, ESG. Yes. Here in Indonesia, you have a lot of that already. You have the large companies, mining companies, oil companies working with NGOs on mangrove restoration. There's even an alliance here in Indonesia about initiatives where private companies are providing some funding. That's positive but, I think, highly insufficient, right? It's not going to go to scale. And corporate social responsibility is nice, but it's completely voluntary, right? Do we really want to rely on something

completely voluntary for something that is so critical, like protecting our coastline? Probably not, right? But it's a combination of all of those. Yeah.

Wang: Yeah. Thank you. Thank you for your assessment. And I think there are a few things that we touch upon but not really discuss in detail. So we got the issue of how to make...generate profits from this project and how to who should be paying back the private businesses. And also how do we convince people not to damage them in the first place, but to protect them.

I think these issues all concentrated into one big question, which is the issue of sustainability. So how do we tell people that the blue carbon is actually a self-sustaining thing that can generate profits? That's...that...the thing itself is a business. Like, how do we persuade people? That's the situation at the moment. And I saw that on one of your articles you called the Jambi province of Indonesia a successful example of sustainable development. So what are the...can you maybe talk to us about some of the already realized benefits of blue carbon and of similar...of environment protection projects that are making profits? And, in that way, how can we convince people on making them more instances incentivized to get more involved in these protection projects?

Aquino: Yeah. I mean, that's the \$60,000 question, right? It is what we are aiming at. We do not really have full-fledged responses for that. But let me try to give you some ideas here and what we have been looking at.

Okay. First thing is, we need to know their resource very well. And that's where technology helps us a lot, right? Why do we need mangroves? Why have they bought it? Your first question there. I gave you a generic question. Sorry, a generic response. Now, let's say that you ask me. Okay, good. But how can you quantify how much mangroves are reducing coastal erosion? Then I'm going to say, well, yeah, there is this one study here, there is...we need to have this data very well. So first thing is, let's get good data and do economic analyses. One of the papers we did is the economic value of mangroves. So we looked at the different benefits at the local level, at the national level, and then at the global level. And we tried to quantify that. And when you do this, you very quickly realize that the value of mangroves or blue carbon standing there is much higher than the value of converting it to shrimp pond. Well, then why are we converting it to shrimp ponds? Easy, because this value that I mentioned is not marketed. It's not monetized. You do not really have a carbon like a full carbon market. You don't have a market for biodiversity. You don't have a market for coastal protection. So all of these ecosystem services, they are public goods. And then in general, we are not paying for it. And we know from literature what happens in this case is the tragedy of the commons, the overuse and all of that.

So here lies a basic thing. How do we monetize these values that these ecosystems have? Okay, that's theoretical. Now we go into practice. One is carbon markets. And again, you need to know how much carbon you have there. So all this research here, blue carbon, the blue carbon research is increasing a lot. We know much more. We know how carbon deteriorates when you...when you degrade mangroves and so on. So realizing carbon markets is one.

Second is increasing the value of the use of mangroves. Can we promote mangroves industries like tourism, like fisheries, adding value to fisheries like these mangrove products?

Third, payment for ecosystem services. Can we provide some continued funding to these communities that live close and spend their time protecting the mangroves? Can we provide some funding to them for doing that? This can be very effective. Where does that money come from? That's the question now. Honestly, this would not cost a lot of money. And we.. like again. And if we compare to the benefits of maintaining mangroves, it would be much higher. But we don't have that. And then I think last it is ensuring that the benefits are being received, captured by the right people. Because sometimes you have private benefits, let's say, shrimp ponds. You have one person, one family making that money. But the cost of the degradation is shared with everybody in that community, right? So

how do we rebalance that? And then again, I mean, when you make payment schemes, you need to be sure that those protecting those facing the cost of protection are benefiting.

And that's the Jambi case. That's where we are working at the provincial level to try to bring an incentive mechanism paid for reduced emissions to the province of Jambi as a whole. We also have that in East Kalimantan. And in this project we are looking at the way of doing that also for mangroves by monetizing blue carbon. And there's going to be a pilot in North Kalimantan, the province of the North Kalimantan where the province is monitoring, measuring carbon, blue carbon and we'll try to get payments and the idea is that then these payments go back to those communities, to those people protecting, restoring the ecosystem.

Wang: Yeah, that's a really great observation and explanation, I think very informative. I really learned a lot. I think it's almost an hour and today's conversation is almost coming to an end. So before we end today's great discussion, I just want to ask one final question, which is about the future and also give people more hope of what we should be doing in the future.

So I just want...I just wondered if you can share, based on your past experience, some successful experiences that you already had on mangrove or blue carbon farming in general. Is this kind of protection project, and this experience...are they universally adaptable in the rest of the world? And also I'd like to just ask you in general, what's your assessment of the future of mangroves? And blue carbon ecosystems in general?

Aquino: Yeah, I think there's hope. I mean, young people, young generations are realizing the importance of taking care of our home, Earth, right? And that with this realization, I hope there will be willingness to engage, to provide funding, to do more research. And this will create momentum to support those people, those communities, those local governments that hold these resources like blue carbon.

So that's the hope. It's that institutions, like yours, they are trying to create more awareness about these issues. They will manage to inform the minds of decision makers, companies, consumers, and it slowly reflects into new choices and behaviors that allow us to protect blue carbon, tropical forests, endangered species. I think that's the biggest hope. I mean, it's the realization that business as usual for the future generations is not an option.

There is another path here that is very hopeful, in my opinion. If you get the incentives right, things change. There's nothing written in stone about degradation of mangrove or forests. They are being driven by very rational choices and they are economic. And we know how economics works. So it's a matter of using the economic instruments we already have to reverse this. But this means then that we need to change our assumption that ecosystem services are free, that they are given. And shift financial resources to that. But we need to shift them at the much larger scale than we have done so far, right? And again, the hope is that the new generation, young people that realize this we will be willing to make these changes, the shifts. So we count on you guys.

Wang: Yeah. So I totally agree. Yeah. On behalf of the young generation, their view, we are definitely more aware of the challenges we are facing and also in terms of economic incentives, aggression, rationales. I think it is definitely...people are paying more attention to how to incentivize the population from these aspects to get people more engaged.

Yeah, it's been a great conversation today. Thank you very much again for joining us, for sharing this valuable information and assessments. I really learned a lot. Thank you very much again for joining us and really looking forward to talking to you again, and in maybe another access event in the future. Thank you.

Aquino: Thank you, Zhangchen. Very nice talking to you and great initiative. Thanks so much. Bye-bye.