Summary Report

APBON 9th Web Seminar

1. Date: 9th September, 2021
   Time: 15:00-17:00 in Japanese Standard Time
   (13:00-15:00 in Cambodia, Thailand, Indonesia, Vietnam), (11:45-13:45 in Nepal)
   (14:00-16:00 in Malaysia, Philippines, China)

2. Location, Participants
   - Webex Meeting Room
   - 19 participants (15 participants and 4 from secretariat) from 7 Nationalities
   - MC: Dr. Muraoka (Gifu University)

3. Program:

Opening and Announcement:

Secretariat of APBON (Ms. Neagari: Biodiversity Center of Japan)

- Greetings from Ms. Neagari from APBON Secretariat
- Welcomed all of the participants to join this 9th APBON web seminar
- The agenda and rules of the meeting were proposed
- Introduced today's MC

Presentation1:

Dr. Alice Hughes (Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences)

"The importance of OneHealth to people and biodiversity"

Summary of presentation

In this session, Dr. Alice gave a presentation about the importance of OneHealth to people and biodiversity. The presentation started with the definition of OneHealth, and she explained why it's important. She said it's important to remember that the majority of zoonotic outbreaks in the past have zoonotic origins. That includes pandemics such as SARS-COV2 that are still ongoing, there are far beyond just COVID but include things like HIV aids which started off for SIV (Simian Immunodeficiency Virus). So she emphasized that we need to understand what driving spillover and how we can reduce

that risk in future. The route of spillover was also introduced here and pointed out that the interactions between those three (animal wildlife, human livestock and viruses) that is what OneHealth. She also talked about the bat and badgers and TB, bats and Hendra as examples. She emphasized that taking to OneHealth approach is absolutely essential, if we want to minimize the risk of disease spreads into future. So understanding links between species, and species and environment are essential.

Dr. Alice also explained about the bats and CoVs, which says Bat CoVs are not rare, but spillover to human is rare. So understanding risks of when and why spillovers may occur is very important.

In the end, Dr. Alice expressed that the interface between livestock and wildlife is also considerable providing risks of spillover via direct contact, parasites or fluids. And she also said that we need better information on how bats respond to stressors and how we can protect them to maintain a safer future.

Q&A Session

Q: I was curious to find out where these were bats samples and what kind of bats they were? Is it a wide sampling or just one kind of bat?

A: So the bats when I talked about the COVID, they're samples from my institute, we sampled the wildlife species I can send you the paper if you'd like to see it. Porcine diarrhoea virus and they are species that move in to areas used by pigs. So they may be involved with spreading porcine diarrhoea virus to pigs. But only the rhinolophids had coronaviruses and there were a lot or within the same population. From some work that has not yet published at this point, we've also found other coronaviruses in Yunnan province. So it is very common in this region it's obviously very widespread. Something else that I didn't mention the rhinolophids are one of the tricky groups of bats. Some other work we've been doing has been trying to classify cryptic species because up to around 70% of species are not currently described. There's a lot of cryptic species out there so we need better data on species identification and when people are doing things like viral studies they really need to also do it barcode on the bat to make sure that they are identifying the correct species. At the moment, even if you look at the early samples of Sars-CoV2-Like viruses in bats, the initial species *Rhinolophus malayanus* was initially identified as the wrong species. They only identified it correctly when they were forced to use the DNA barcode. So we need better data on the wildlife and domestic animals to see what interactions look like.

Q: I think many people are interested in connection between habitat destruction on bats,

and also special structure what distribution of livestock and bats. Scientists are not sure how those three factors contribute to spillover, so we need more a comprehensive assessment of negative importance of three factors, and distance special structure of livestock and bat habitat and human use of bats for food. So do you have any particular idea to assess relative contribution to these three factors?

A: It's a really good question. The case of corona-virus that hasn't yet been done but it has been looked at in case Hendra and Nipah where there were very direct interactions. Studies so far that have said they have done it but have not done it. They basically overlaid unrelated GIS layers and generally displayed poor understanding of things like bat specific ecophysiology. So the paper came out a few months ago now, but they were bat-livestock interactions very simplistically because they had very low resolution data. Echolocation calls, their wing structure is adapted for specific environments and habitat densities, they do not move outside those landscapes.

So the types of analysis that have generally been done have not used appropriate data. Some analysis we've started to try to do with is also have been looking like species demography. We know the across the year risks are going vary, these species are shift between caves during different parts of the year. Females typically will use maternity roost where they were born. During that part of the year they will set actually segregate and only those individuals will use it. So they're using different parts of the landscape at different times. In terms of the eco-physiological stress obviously periods by there is scant food, for example during the wet season where their foraging period limited is going to be more stressful in the winter.

Something that we are just starting to try to unpick is how does landscape management and these seasonal stress events interact to increase things like the viral load with the viral incidents in different species. As yet quantitative assessments have not been done but they are urgently needed. Something interesting like observed from 14 years or so when I working in Asia, almost every rural area if you go to caves you will find evidence. It's very common than even last year during the pandemic my students were finding hunting occurring at some cave sites. What we are probably seeing now though is it's becoming something that is much more recreational which means that we don't know how long people will continue these activities for.

So if you've grown up eating bats in your village and then you go to a big city for a couple of years to study and then you come home and you eat bats with your family, are you still immune? Have you still retained that immunity? Because it happened and that immunity is decrease when you go back to university the next term you may actually get the disease. So understanding all these types of factor is really important and we

don't have a good idea yet. That's also very interesting it's in the case of corona viruses, if you look at publications from 2018, 2019 there were probably papers for showing these types of corona viruses are in bats. It was not seen as a big issue until the pandemic happened. And even after study was initiated the year before the pandemic because it was something that we thought would be interesting to look at before we observe the risk. So we need better collaborations between immunologists between virologists between conservation scientists so we can better understand how these factors link, and actually have integral to OneHealth approaches to maintain species health. Because at the moment it's happening in parallel and if you look at almost every virological researcher, those people don't know how to handle the bats. So their assessments of how we manage ecosystem is really bad.

Q: You are in a very wonderful position to assess those factors, so I'm very much looking for we could find in future. And I'm thinking that some simple models are spillover process would be helpful, do you have any model?

A: So we have not made one yet, but the analysis I showed from Africa which was done by another group when they were looking for Ebola, is something we've been thinking about applying we just want to make sure we have date of the correct resolution because as long as the problem is that when a model is done badly the people who are interpreting it wouldn't have faith on that. So we need to make sure that it is accurate enough that any types of error would not have negative implications. So it's something that we are starting to work on now we are collecting the data for but we don't have as yet. One of the major issues is that, for example my institute have about 42 bat species and before we increase cryptic species that we are trying to describe now. All of those species have different risks and different profiles, so trying to integrate that type of data it's challenging to do well but it's a work in progress. I can send a link of ebola paper though because they did some interesting stuff but will looking at how we could do something creative.

Q: How we can deliver your findings or insights to the concept? I mean corporative idea with AOGEO or of course you reserve this in APBON of course, because I saw many geospatial information from your analysis and data and I also read your email that touching something that we need kind of corporate corporation with AOGEO to filling the data gaps. So maybe this could be one of the topics that we will discuss in the next month APBON workshop but any idea and quick response will be welcomed.

A: I think that would be a great idea. I do a lot of spatial analysis myself, because I

think using spatial approaches is a fantastic way to give research context to understand the interactions between species and environment. And I think something APBON is great site to understanding the ecosystem from the ecosystem point. I think by working more with AOGEO we can interpolate that so we could try to get things that get more generalizable or connect data in a way that we can understand the systemic processes of underline the patterns we see. And I think that that would be a real potential and many of the people had incredible on-site data. How do we make the most of that data so we understand the implications is more important.

Presentaton2:

Dr. Angela Quiros (Akkeshi Marine Station, Field Science Center for Northern Biosphere, Hokkaido University)

"Blue Carbon Ecosystem Services and the social vulnerability of fishing communities."

Summary of presentation

Dr. Angela said she was honored to be invited by the APBON seminar series to give this presentation on her research, which is the part of collaborative program between Japan and Philippines and Indonesia called Blue CARES.

In this session, she talked about Blue Carbon and Ecosystem Services within the context of small-scale fisheries in mangroves and seagrasses Busuanga Island, Philippines. She shared a social ecological approach to assess blue carbon ecosystems, and used mixed methodology to assess the quality of blue carbon ecosystems and the social economic context of the communities that rely on them. Using these multiple sources, she explained that we can inform quality policy decisions at the local scale which are scalable to the national level and beyond

Her presentation started with the introduction to blue carbon and ecosystem services, then the Philippines context, and the Vulnerability framework, the methods and results, and the take home messages.

Through the above explanations, the conclusions of her presentation are summarized as:

-Vulnerability criteria can help address multiple SDGs at once, while tackling natural resource management issues.

-4 policy prescriptions for Busuanga Island

(For more details, please refer to the presentation materials.)

Q&A Session

Q: I understand it from your presentation that the tourism and also the exposure to social changes are kind of risks to the blue carbon ecosystems, also I 'm thinking that how do you reset climate change for example rising sea water temperature could affect blue carbon ecosystems or to some ecosystem services to the local communities. Do you have any idea about it?

A: That's a really good question because most of the vulnerability studies that I have seen have looked at variability of habitat of communities to climate change impacts and these impacts were mostly physical impacts, like sea surface temperature, increased storms, higher tides etc. And the difference with this study is that it doesn't consider exposure at that scale. Other studies have found that exposure to adjacent barangays within the same municipality are the same, so for our study, exposure variables such sea surface temperature or increased storms would have the same level among the barangays studied. But my exposure variables were the impacts of human actions such as tourism and urbanism. So, I really want to look at impacts of peoples' behavior and human development, rather than these physical aspects.

But to answer your question, Busuanga Island is pretty small and within the context of the sea surface temperature, all of the Busuanga barangays will experience that same exposure to a climate change impact such as this because it's such a fine-scale study. However, if we were to do a similar study all over the Philippines or regionally in South East Asia the answer is yes, the different sites would have different exposure values for sea surface temperature etc. But at least for our site it's too fine scaled a study, so they all have the same exposure level anyway.

Q: If you aim to inform decision makers or some governments for the conservation of ecosystems, your ideas are based on exposure to these human activities and then your findings coupled or integrated with the impacts of such physical stressors so that you could have integrated knowledge which will be quite useful for decision makers for conservation of blue carbon ecosystems from much more aspects.

A: I agree that incorporating these fine-scale data to larger scale data would be informative but one thing I wanted to add which is I believe one of the key findings of this paper is that even within one island, there are significant differences in both the use and the quality and quantity of these ecosystems, and so we can't really generalize but what I think this can show is that because there's so many other coastal communities all over South East Asia , we cannot generalize them to say "this is how they will act", so I think that will at least help the decision makers just to be aware of

the fact that ecosystem service delivery is partial, and it is patchy.

Q: I appreciate your comments. Because whenever I joined the meetings of the GEO, they always discussing the importance of in situ data and local knowledge. But they are all thinking about some physical aspects of the earth system or ecosystems. So our ideas or insights based on the local community ecosystems would give more kind of meaningful knowledge for the decision making processes.
A: Yes, it's very patchy. This type of data is difficult to get, you actually have to talk to every single person, go to their house. Furthermore, the landings of small-scale fisheries are largely invisible fisheries. But as I showed at the start of the talk, they make up equal amount to the commercial fisheries. It's very hard to find records of them. So you have to go out yourself and make friends with the locals, get catch diaries to get this data over periods of time.

Q: What do the fulltime fishers do? Is there alternative livelihood beside fisher?
Another question is, is the Barangay community fishery healthy? And does the climate change have an impact on the protected area?
A: Thank you so much, your questions were great. I'll just address them one by one. When I did the household interviews, I asked the head of the household percentage contribution to your household income. I didn't ask for a value and I didn't ask for a number of hours, so this is just in the local persons head, OK, so fishing makes half my income but actually I have a small farm and I raise pigs and chickens, and my wife has a little store, so fishing would be 50, farming would be 30~40 and 10% would be like a little commercial something on the side and so that's how we calculated livelihood. In these coastal communities actually these alternative livelihoods are farming, they are involved in transportation, maybe they have a store or they have a fish processing sideline. Another thing and especially in Coron municipality, it was tourism that has that contributed to the household. So I believe that these diverse livelihood approaches really help the locals, so the barangays did not have absolute high sensitivity for social economic variables.

Maybe was a portion of respondents which were full time fishers and we divided them into fisher versus gleaner, fishing in boat, gleaning, which means walking around picking up your food during low tide. Barangay is the coastal community, it's not the fisheries territory, just a village. And protected areas in Busuanga Island are mostly focused on coral reef area, as they do in other places. But now the local government is

starting to have some protected areas, this cover seagrass and mangroves, though it's not fully developed yet; they're working on it.

In terms of variables related to climate change as part of this vulnerability assessment, I did not include any because I thought that all the Barangays in the villages received that same exposure. And I didn't include any variables to show how the fish catch was decreasing or about illegal activities, and I think those are really good variables to add for sensitivity. Thank you for that idea for other vulnerability assessments I think those parts are quite important, but from my in-depth interviews people have said that their catches were decreasing.

Q: I was wondering what are the key recommendations; very simple questions for conservation intervention in the area, because it this is very detailed and crowded work. So I was wondering if there has been any interventions or recommendations for the area and how this will be integrated into the decision making at the local and also at the nation skill?

A: Thank you so much that's a very good question. One of our key partners, they are also co-authors of this paper is the NGO C-3 Philippines. And one conservation intervention they've done already is mangrove rehabilitation and caretaking, and training of the locals; they do that in a few of these Barangays.

The next step for this type of work is when I'm allowed to go back to the field, is to workshop with the local decision makers, and each of these Barangays showing them their vulnerability score. Because Filipinos like friendly competitions, sharing these scores will make it more interactive or fun, and we can have positive suggestions. And I think giving this information to the local mayors and also the governor at the more regional level is important. A solid suggestion is to invest more in the education, because some of these Barangays have no high schools, and we can improve that by adding high schools or improving their roads in between barangays, so they have access to neighboring high schools. Simple things like that, I know the NGOs are leading the way for a lot of these conservation efforts, but to also encourage other groups to be more active in the area and I think that will have improvements both on the local and the national scale.

Adding on that, some of the data collection was done by local policymakers and for example C-3 mangrove caretakers. We use their catch diaries or they recorded the catches of other fishers from the landing point where they went. So I think that with

some of this type of research where you really get involved with the community and then share the results with the community afterwards, when we have a chance, hopefully we can improve the situation.

General discussion and Information exchange

-The information and details of 13th APBON Workshop (19 October) were shared.

-The information and details of 14th AOGEO Symposium (10-12 November) were shared. It requires inputs from all task groups of AOGEO including APBON, so the draft concept of inputs will be share by Dr. Muraoka later.

-Side event will be held on 25th November 2021 during the "GEO Week 2021". 3min for each task group will be needed in this side event.

-The outline of the 13th APBON Workshop was discussed as below.

The 13th APBON Workshop

APBON Asia Pacific Biodiversity Observation Network

Date/Time: 19th October 2021, 11:00 – 16:30 JST (tbd)

Objectives:

- ☐ Scoping collaborative work plan of APBON in the next ca. 4 years (~2025), which is the first half of APBON's strategic plan toward 2030.
- ☐ Preparing inputs/deliverables to the 14th AOGEO Symposium (10-12 November 2021) for discussing biodiversity-related issues and for scoping 2023-2025 AOGEO Implementation Plan document, and a short presentation at the GEO Week 2021 side event (AOGEO highlight).

11:00 – 11:30 (JST)	**Session 1: Scene setting [30 minutes]** • Opening remarks • Objectives, expected outcomes, working hypothesis
11:30 – 13:30 (JST)	**Session 2: Breakout group session [2 hours]** • Identifying knowledge to respond to national, regional, and global needs (e.g., national reporting to CBD; NbS; joint climate-biodiversity targets; post2020; 30by30) • Brainstorming design of collaborative research and synthesis (e.g., refining EBVs for Asia-Pacific; etc.) • Analyzing data availability and accessibility • Next steps Terrestrial WG | Freshwater WG | Marine WG
13:30 – 14:30 (JST)	Break
14:30 – 15:30 (JST)	**Session 3: Group reporting and joint discussion [1 hour]** • Reporting group discussion findings & outcomes • Discussion/planning joint-WG research (e.g., landscape approach: land-river-coast)
15:30 – 16:15 (JST)	**Session 4: Collaboration with partners and plans for stakeholder engagement [45 minutes]** • Collaboration plan with Key Biodiversity Areas (KBA) • Collaborating with Task Groups of Asia-Oceania GEO for nexus study, filling data gaps, etc. • OECM (to be planned for a future web seminar)
16:15 – 16:30 (JST)	**Wrap-up and closing [15 minutes]** • Summary • Next steps

-It was introduced that there are 2 parts to contribute from APBON here, and one of the special sections is focusing on the biodiversity for understanding climate change and disaster risk reduction. And the draft was shared as well. The second one is the discussion of task activities section which will held on day 2 of 14th AOGEO symposium.

The 14th Asia-Oceania GEO Symposium

Date/Time: 10 – 12th November 2021, 12:00 – 16:00 JST

Venue: Online

Theme: Envisioning AOGEO in 2022 and beyond

	9-Nov	DAY 1	DAY2	DAY3
	Tuesday	Wednesday Nov 10	Thursday Nov 11	Friday Nov 12
12:00		Welcome remarks Scene settings	TGs activities status report & next implementation plan for 2023-2025 TG1-TG9	Special Session 2: Earth observation for Pacific islands (tentative)
12:30		Country reports		
13:00				
13:30		2023-2025 GEO work programme: Guidance for development of implementation plans		Break
14:00	CB Meeting	Break	Break	Special Session 3: Earth observation for Climate change
14:30		Special Session 1: Biodiversity for adressing climate change & disaster risk reduction	TGs activities status report & next implementation plan for 2023-2025 TG10-12	
15:00			IPS activities status report & next implementation plan for 2023-2025	
15:30			TG cross cutting discussion session	Closing Session
16:00			Statement meeting	
16:30				
17:00				

Day 1 (November 10)

14:30 – 16:00 **Special Session 1: Biodiversity for addressing climate change & disaster risk reduction**

Session Chair: under coordination

Speakers: under coordination

- Keynote speech outlining the contributions and importance of the biodiversity for the addressing climate change and disaster risk reduction.
- Presentations and discussions on the showcase and need of EO data and information on biodiversity contributes to address climate change and disaster risk reduction.

Asia-Oceania region contains high biodiversity which provides various ecosystem services including natural resources, environmental regulations, and cultures, but they are susceptible to drastic climate change and human impacts on ecosystems. This session focuses on learning the challenges in biodiversity issues under climate and societal changes, and identifying needs of biodiversity and ecosystem observations, data and knowledge sharing, and stakeholder engagement to address climate change mitigation and adaptation, and ecosystem-based disaster risk reduction by focusing on biodiversity and ecosystem services. The findings will be delivered to further planning in cooperative activities in the region as well as with GEO Work Programme.

Draft session structure Concept to be fixed tomorrow at AOGEO Coordination Board

Session moderators: Hiroyuki Muraoka and ###

14:30 **Introduction**

14:35 **Keynote presentation (20 min):**

- Dr. Hiroya Yamano, Director, Division of Biodiversity, National Institute for Environmental Studies, Japan (confirmed)

14:55 **Challenges, needs and opportunities (10 min for each):**

- From Pacific islands and countries (tbd)
- From Asia-Pacific Biodiversity Observation Network (tbd)
- From GEO BON (Dr. Petteri Vihervaara, confirmed)

- NbS
- OneHealth
- Landscape concept
- Interdisciplinary approach (with AOGEO)

15:30 **Discussion**