

## 1) Name of the meeting

Asia-Pacific Biodiversity Observation Network (AP-BON) Working Group (Working Group: WG2) in the 7th Global Earth Observation System of Systems (GEOSS) Asia-Pacific Symposium

## 2) Purpose

AP-BON WG aims to review the current situation of biodiversity observations of terrestrial and aquatic ecosystems in Asian-Pacific region to pave the way for introducing the cutting-edge techniques for observation and modelling. We thus try to clarify what are needed as observing targets and also discuss to find feasible ways for observation. At the end of meeting, we have a discussion on “integrated study in Cambodia”, which is a cross-cut theme of 7th GEOSS AP.

## 3) Data

Tuesday, 27 May 2014 (Symposium period: 26 May 2014 -28 May 2014)

## 4) Venue

Meeting room 106, 10F, Kokusai Fashion Center (Sumida-ku, Tokyo)

## 5) Participants

44 participants from 8 countries (6 from Asia and 2 from Pacific) and 2 international organizations

## 6) Agenda

09:30-09:45 Registration - Morning Coffee

09:45-09:55 Opening address Dr. Yahara (Co-chair of WG2, Kyushu Univ., Japan)

09:55-10:00 Welcome address Mr. Reiji Nakayama (Director, Biodiversity Center of Japan, MOEJ, Japan)

09:55-14:05 Session 1: What we could know with current observation techniques

09:55-10:00 Session introduction Dr. Ishii (Co-organizer WG2, JAMSTEC, Japan)

10:00-10:40 “Coral reef in a changing world: Climate change and land-based pollution issues”  
Dr. Hiroya Yamano (NIES, Japan)

10:40-11:05 “Effects of land-use change on watershed discharge and nearshore reefs of Palau”  
Dr. Yimnang Golbuu (Palau International Coral Reef Center, Palau)

11:05-11:30 “Satellite Remote Sensing Applications for Monitoring Marine Environments in the Asia-Pacific Regions” Dr. Eko Siswanto (JAMSTEC, Japan)

11:30-12:00 “A new earth observation tool using multiple stable isotopes: an example of eutrophication diagnosis in Lake Biwa, Japan” Dr. Takanori Nakano (Research Institute for Humanity and Nature, Japan)

12:00-13:00 Lunch Break

13:00-13:25 “Coastal pollution and its control strategy in Funafuti atoll, Tuvalu”  
Dr. Masafumi Fujita (Ibaraki Univ. Japan)

13:25-14:05 “Managing agricultural & port derived pollution in the Great Barrier Reef-success and failure”  
Dr. Jon.Brodie (James Cook Univ., Australia)

14:05-14:15 –Short Break-

14:15-15:25 Session 2 Country/Regional Reports (Chair: Dr. T. Nakashizuka)

14:15-14:25 Dr. Chan-Ho Park (National Institute of Biological Research, Korea)

14:25-14:35 Dr. Dedy Darnaedi (Indonesian Institute of Sciences, Indonesia)

14:35-14:45 Dr. Sheila Vergara (ASEAN Centre for Biodiversity, ASEAN)

14:45-14:55 Dr. Yu-Huang Wang (Taiwan Forestry Research Institute, Taiwan)

14:55-15:05 Dr. Keping Ma (Chinese Academy of Sciences, China)

15:05-15:15 Mr. Mangal Man Shakya (Wildlife Watch Group, Nepal)

15:15-15:25 Dr. Eun-Shik Kim (Kookmin Univ., Korea)

15:25-15:35 Coffee Break

15:35-16:35 Discussion on the integrated study in Cambodia

16:35-17:25 General discussion of WG2

17:25-17:30 Closing remarks (Dr. Nakashizuka, Co-chair of WG2, Tohoku Univ., Japan)

During the session 1, 4 presenters reported addressing the observation techniques in the morning, and 2 presenters reported the same theme after lunch break. The following session 2, 7 presenters reported the country/regional report. Then, the discussion on the integrated study in Cambodia and the general discussion of WG2 were taken place. The main point of the presentations and the discussions are described in the below.

#### 1) Opening

##### i. Opening address Dr. Tetsukazu Yahara (Kyushu University, WG2 Co-Chair)

He expressed the appreciation for the participation in WG2. The brief overview of AP-BON and information web page of the AP-BON 5th meeting, which was held in the last year, was introduced.

##### ii. Welcome address Mr. Ryuji Nakayama (Director the Biodiversity center of Japan, the Ministry of the Environment)

He expressed the appreciation for the participation of WG2 and the corporation of holding the AP-BON. Hoping that the outcome of this meeting will contribute to the biodiversity conservation in the Asia Pacific region.

#### 2) Session1: Current observation techniques Chairs: Dr. Ishii & Dr. Yamano

##### i. Session introduction Dr. Reiichiro Ishii (Japan Agency for Marine-Earth Science and Technology: JAMSTEC, WG2 co-organizer)

[Overview]

He explained integration of remote sensing and field surveys, and briefly introduced the presentation of session 1.

##### ii. “Coral reefs in a changing world: Climate change and land-based pollution issues”

Dr. Hiroya Yamano (National Institute for Environmental Studies: NIES, WG2 co-organizer)

[Overview]

Coral reefs have been decreasing due to influence of multiple stresses such as sea surface temperature warming, ocean acidification, or sediment discharge. Dr. Yamano explained the impact of sea surface temperature warming and land based pollution on coral, and remote sensing technologies to observe such impact.

The research conducted in Okinawa reported that sediment discharge into the coastal area affects not only cause of coral reefs decline but also reducing the resilience of the coral reef breaching.

For the sustainable land use and the management of coastal ecosystems, building a framework with ecology, civil engineering, and social economics are needed.

[Q&A, related comments]

Dr. Brodie: Comment: We have the same sugar cane issues regarding in the GBR (Great Barrier Reef).

Continue to talk to farmers and you may be able to get cooperation.

##### iii. “Effects of land-use change on watershed discharge and nearshore reefs of Palau”

Dr. Yimnang Golbuu (Palau International Research Center)

[Overview]

Increasing sedimentation by the land use is a worldwide crucial issue for coral reefs. Coral reefs in Palau are also affected by the increased sediment. The sediments of four different watersheds were investigated for the impacts of the coral reefs. The results of the investigation showed that there is a strong relationship between EMP (Earth Moving Permits) and river sediment yield.

In addition, benthic surveys and some coral reef transplants were implemented to assess the impact of sedimentation on coral reef. The results showed that sedimentation and turbidity exerted strong influence on coral diversity than the coral cover. To continue the monitoring and review the current regulation for the control of sediments are needed in order to conserve the coral reefs.

[Q&A, related comments]

Dr. Vergara: Most monitoring methods in ASEAN region uses coral cover as indicator, but you have suggested coral diversity. There is not much expertise on coral taxonomy, do you have training opportunities (for the researchers)?

Dr. Golbuu: Even just the genus level information is very useful. In the near future, it may be possible that sediment resistance reefs could be dominant.

Dr. Ishii: The four different watersheds were studied, are there any other factors?

Dr. Golbuu: Size of catchment, flow, population, forest covers are also investigated, but significant relationship was only EMP.

Dr. Yamamo: History of land development in Palau, any specific event that caused significant sediment discharge?

Dr. Golbuu: Recently, road construction causes huge amounts sediment discharge, especially affected by unpaved roads.

iv. “Satellite Remote Sensing Applications for Monitoring Marine Environments in the Asia-Pacific Regions” Dr. Eko Siswanto (JAMSTEC)

[Overview]

To understand the changes of the coastal ecosystems, several kinds of monitoring of primary production of Phytoplankton have been studied. Comparing three kinds of monitoring (in situ, model, satellite) were conducted in order to see their efficiency using the impacts of typhoon or red tide data. Dr. Siswanto explained that decreasing discharges from the land increase primary production of Phytoplankton or the impacts of the water temperature changes due to typhoons or ENSO (El Niño and the Southern Oscillation).

The Remote sensing is a useful tool to discern marine ecosystem changes and driving factors. However, there still exist some gaps in a certain area/field therefore the Remote sensing has not been fully utilized. A regional collaboration (data sharing) in the Asia-Pacific region is highly required in order to better utilizing of the remote sensing observation.

[Q&A, related comments]

Dr. Qinxue Wang (NIES): About Red tide in the South China Sea, what is relationship between discharge, chlorophyll-a, and with other nutrients?

Dr. Siswanto: We found positive correlation between discharge and chlorophyll-a, but we didn't have satellite data on nutrients.

Dr. Qinxue Wang: I think nutrients are involved in the discharge.

Dr. Siswanto: The limiting factors are mainly light and water temperature.

Dr. Yu-Huang Wang: In situ data, I want to know the composition of the phytoplankton.

Dr. Siswanto: My colleague is looking into that local algorithms, but (do not know the detail) I can not answer it.

Dr. Yu-Huang Wang: The risk of high chlorophyll-a and red tide could be happen the same tendency?

Dr. Siswanto: First, high chlorophyll-a can be an indicator, but using satellite data, be careful about high sediments on the coastal area.

v. “A new earth observation tool using multiple stable isotopes: an example of eutrophication diagnosis in Lake Biwa, Japan” Dr. Takanori Nakano (Research Institute for Humanity and Nature)

[Overview]

Using stable isotopes as observation tools, some surveys were conducted to detect water quality in the Lake Biwa. The results of the surveys showed that human activities caused water quality worse, especially agriculture affected eutrophication of the lake.

Researching for the society, cooperation with local communities is necessary. Holding brief sessions in the local communities were taken place and researchers and the locals communicated through making local water quality maps. Collaboration with scientists in various fields and society are important for the future. Therefore, the research method in cooperation with the local residents is contributing to the creation of trans-disciplinary science with local capacity building.

[Q&A, related comments]

Dr. Brodie: Since 1960s, the change of the agriculture have caused increasing Nitrogen or Sulfur?

Dr. Nakano: Around the Lake Biwa, there were many inland lakes, but after 1950s, those lakes were disappear. Then, nutrients have flowed into the Lake Biwa directly.

vi. “Coastal pollution and its control strategy in Funafuti atoll, Tuvalu”

Dr. Masafumi Fajita (Ibaraki University)

[Overview]

The coastal of Tuvalu is formed by mainly foraminifera (Calcifying organisms). However, the coastal ecosystem is being destroyed by the impacts of human activities or global warming. Because of those, foraminifera is decreasing. Dr. Fajita introduced the status and mechanism of the coastal pollution and the control strategy for coastal pollution in Funafuti atoll.

The field surveys were conducted in Funafuti atoll. The results of the surveys showed that the cause of the pollution was mainly drainage from the septic tank of homes. Japan has experienced and recovered from water pollutions. Referring to the past Japanese experience such as regulations or technologies concerning water quality, some experiments, which are removing heavy metals or organic matters from domestic septic tanks, were implemented. In addition, Dr. Fujita suggested capacity building and establishment of water management organization.

[Q&A, related comments]

Dr. Yamano: Putting some bacteria in the septic tank, does it cause any issues?

Dr. Fujita: Using attached media to prevent bacteria runoff from the tank.

- vii. “Managing agricultural & port derived pollution in the Great Barrier Reef – success and failure” Dr. Jon Brodie (James Cook University)

[Overview]

The coastal region of the Great Barrier Reef (GBR) has been changed coastal forests to agricultural lands over the past 200 years. Due to the changing land use along the GBR, sediments or pesticides were increasing, and because of those, the coastal ecosystems have degraded. Dr. Brodie introduced the history of the GBR control managements.

Some of those control managements for agriculture or livestock industry to conserve the coastal coral reefs have been partially successful. However, the port developments have poorly managed and those control managements are not working well. To better coastal management, continuing efforts for the terrestrial runoff management and enforcing the Marine Park zoning are necessary.

[Q&A, related comments]

Dr. Vergara: Quite sad about the GBR, because we expected that the GBR management will be a successful case study for the coastal management. What are the lessons for us from the GBR management?

Dr. Brodie: For conserving the GBR ecosystems, to incorporate watershed managements with marine protected area managements such as fishery management is important.

Dr. Ma: I think climate change is a major cause of the coral reefs decline.

Dr. Brodie: The major cause of the coral reefs decline was sediments. In the future, climate change will be cautious.

Dr. Nakashizuka: I remember that your colleagues are studying for restoration forest along the river. Does it effect to protected areas?

Dr. Brodie: I have rarely data. To protect riparian area from the impacts of cattle erosion is probably important.

- 3) Session 2: AP-BON Country/Regional Reports Chair: Dr. Nakashizuka

- i. South Korea: “K-BON: Observation and Research with Civil Scientist”

Dr. Chan-Ho Park (NIBR: the National Institute of Biological Resources)

[Overview]

Some of K-BON activities and their contribution to biodiversity conservation were presented. Announcement was made on CBD COP12 which will be held in South Korea this coming October.

[Q&A, related comments]

Dr. Motomi Ito (University of Tokyo): Are K-BON data shared among citizens and international communities?

Dr. Park: Data are available for citizens but not yet for relevant international networks such as Global Biodiversity Information Facility (GBIF). International data sharing is expected in near future.

- ii. Indonesia: “Country Report on The Seventh GEOSS Asia-Pacific Symposium:”

Dr. Dedy Darnaedi (Indonesian Institute of Sciences)

[Overview]

A presentation was made on AP-BON related activities in Indonesia and their progress. An evaluation of biodiversity level of forest ecosystems in different locations revealed that biodiversity loss including forest degradation and species loss is still ongoing on most islands. Indonesia-BON is not yet established due to limitation in funding, expertise, technology, etc. Transdisciplinary efforts and international cooperation are necessary to support achievement of the Sustainable Development Goals (SDGs).

[Q&A, related comments]

None

iii. AP-BON: “The 5th AP-BON Workshop”

Dr. Sheila Vergara (ASEAN Centre for Biodiversity, co-chair of WG2)

[Overview]

An overview of the 5th AP-BON workshop was reported. In the 5th workshop, assessment of gaps in biodiversity information, information sharing, etc. were discussed. Technical issues such as on how to ensure completeness and accuracy of information, as well as administrative issues such as lack of incentives, funding and systematic reporting were highlighted. It was revealed that Asia data contributes only about 3% of GBIF. Furthermore, recommendation was made on contribution to IPBES by regional red list, Key Biodiversity Area maps, regional Essential Biodiversity Variables (EBVs), etc.

[Q&A, related comments]

None

iv. Taiwan: “Spotlight on TaiBIF National Activities”

Dr. Yu-Huang Wang (Taiwan Forestry Research Institute)

[Overview]

Some of the national activities of Taiwan Biodiversity Information Facility (TaiBIF) were introduced.

TaiBIF, in coordination with other national portals such as TaiBNET, TAiBOL and TaiEOL, establishes an integrated national data base. Its website is prepared both in English and Chinese to promote information sharing among citizens. Also, Facebook is used for reporting by the citizens.

[Q&A, related comments]

None

v. China: “Long-term monitoring on Chinese Forest Biodiversity (CForBio)”

Dr. Keping Ma (Chinese Academy of Sciences)

[Overview]

An overview of China Forestry Biodiversity Monitoring Network (CForBio) and its activities were introduced. One of its main activities is forest dynamic study using Forest Dynamics Plot (FDP).

Other activities include Biodiversity Ecosystem Functioning project in China (BEF-China), publication, etc. CForBio aims to coordinate with other various networks through Asia Biodiversity Conservation and Database Network (ABCD-Net).

[Q&A, related comments]

None

vi. Nepal: “Nepal-BON (N-BON)” Mr. Mangal Man Shakya (Wildlife Watch Group)

[Overview]

Past and present activities of Wildlife Watch Group (WWG) and how it came to participate in N-BON were presented. Since its establishment in 1993, WWG has been working on monitoring of illegal trade of wildlife. After 2010, its activities are focused on expansion of AP-BON through promotion of N-BON and assessment of impact of climate change.

[Q&A, related comments]

None

vii. South Korea: “Issues of Consideration for the Promotion of the AP-BON”

Dr. Eun-Shik Kim (Kookmin University)

## [Overview]

After introduction of K-BON activities in Korea, an overview of Global Forest Watch (GFW) which allows users to access forest monitoring data was presented. GFW was established under cooperation of more than forty organizations including Google.

For promotion of AP-BON, socioeconomic support in addition to biological and ecological one is important. Governance, infrastructure, monitoring and contribution to society are essential. Contribution to IPBES through AP-BON is specifically important and consideration of the following was proposed.

1. evaluation based on observations
2. generation of knowledge as products of observations
3. policy support based on generated knowledge
4. capacity building for human beings and the society

## [Q&amp;A, related comments]

Dr. Brodie: Monitoring seems to be focused on forests but are you considering of expanding it to coastal and marine areas? It is necessary to examine links between these and terrestrial ecosystem.

Dr. Kim: Yes. At the moment, monitoring centers on land, however, it will eventually be expanded not only to coastal area but also to marine area.

Dr. Yahara: GEOSS 10-Year Implementation plan ends in 2015 and post plan starts next year. In the next step, emphasis may shift from observation to coordination with social systems. Also, IPBES focuses not only on evaluation of biodiversity and ecosystem services but also on interaction with social systems. Therefore, linkages to socio-economy will be important. Future Earth (FE) is making consideration of solution oriented science.

As such, importance of AP-BON is increasing and it is expected for AP-BON to integrate various regional activities related to biodiversity.

Dr. Kim: That is why it is necessary to prioritize AP-BON actions. ( Eun-Shik Kim )

## 4) Discussion for the integrated study in Cambodia and General discussion of WG2

This session was facilitated by Dr. Yahara, the co-chair, and Dr. Ishii, the co-organizer. Draft Tokyo Statement was read out and case study of Cambodia which was the theme for the former was introduced. The participant commented to Draft Tokyo Statement, while discussing the integration of various studies taking Cambodia for case study.

Dr. Yahara: Efforts for Cross cutting and interlinkage of SBAs (Societal Benefit Areas) are expected for each country. Please consider how we can link biodiversity and ecosystem observation with disaster science or hydrology which is common issue both in coastal and freshwater systems.

Dr. Nakano: There are many hydrological monitoring stations, do you have any idea to integrate those monitoring stations?

Also, there are different kinds of hydrological information and biodiversity information. Is there an effort of making links among these information? This should be a proposal from APBON to AWCI (Asian Water Cycle Initiative).

Dr. Ma: We need the statement to guide people to identify key challenges in the framework of GEOSS, and try to guide people toward solutions. Importance of transdisciplinary is addressed in the draft, besides this I think we should put following some key challenges; 1) Networking among existing networks, 2) Data sharing, 3) Capacity building in Asia in particular and 4) Promotion of science and policy interface.

Dr. Vergara: I would like to add introduction of our session in the recommendation. Past AP-BON session focused on terrestrial, but now we are trying to include coastal and marine and therefore this session has been emphasized. In addition, mention about new technology we learned today in the recommendation.

Dr. Ishii: In recommendations, we will include expansion of focus to marine and coastal and new technologies mentioned. We can also recommend data and site sharing among other WGs, but data sharing and site sharing have always been recommended for a long time. It is important to continue to claim but may be better if we recommend for specific region.

Dr. Ito: I agree with Dr. Ishii, it is important to share data among different sectors. However, before that,

biodiversity communities including AP-BON cannot achieve data sharing, even we are in same field. We should work together to integrate biodiversity data first.

- Dr. Yahara: As for Cambodia case study, we still need more solution oriented discussion. For example, forest loss in Ton Le Sap is quite serious, we have never discussed solution and local people still use wood for energy. Such kind of issue is looking solution.  
As for Dr. Nakano's question, we have visited both hydrological observation sites and biodiversity observation sites, thought it is not easy to integrate the observation methods and to share the observation sites because each site is designed for specific research.
- Dr. Ishii: Maybe some barriers prevent data sharing and site sharing in Cambodia. But in Malaysia, it has been done based on lot of efforts of scientists and relevant people. Comparing with successful case and difficult case, we can identify the possible barrier against realization of data sharing
- Dr. Vergara: I could share ASEAN situation. We have information sharing platform in Bureaucracy in ASEAN region and focal points are assigned in each country. An issue is how the focal points manage data at national level so that data comes to regional level.
- Dr. Brodie: We have same problem in Australia. Many scientists tend to keep data in common store until published. But data sharing after published is encouraged. Especially government research institutes are encouraged to publish research result on the assumption of data publish, even though they don't have the culture of publishing.
- Mr. Shakya: Data sharing at regional level sometimes can be political issue depending on government relationship. For example, study on ecology of tiger habitat was planned to be done in India, but due to some political reason in India, the project was sifted to be conducted in Nepal even we have less tigers than India.
- Dr. Kim: About 3rd para 6th line of the Tokyo statement "these efforts should be conducted ... such that they produce integrated and actionable information on temporal spans...", I would like to add "knowledge", not only "information" because knowledge is next step we might need, and also add "spatial scale" not only "temporal spans".
- Dr. Nakashizuka: As for Tokyo statement, we will have co-chairs meeting after this session to convey the comments to the GEOSS secretariat.
- Dr. Yahara: Next AP-BON workshop will be held from 4<sup>th</sup>-5<sup>th</sup> Oct. in Korea just before CBD COP12 from 6<sup>th</sup> Oct. And we also plan to do side event at CBD COP12. CBD COP12 will be good chance to discuss the progress toward achievement of Aichi Target and also we will extend our discussion of AP-BON.

##### 5) Closing

Closing remarks (Dr. Nakashizuka, Co-chair of WG2)

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[END]