4th International Conference on Integrated Natural Resources and Environment Management (INREM 2023)

"Future-Proofing Sustainable Ridge-to-Reef Transformations through INREM"

21-23 November 2023
Century Park Hotel Manila, Philippines

CONFERENCE REPORT

The 4th International Conference on Integrated Natural Resources and Environment Management (INREM 2023) is organized by

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TABLE OF CONTENTS

THE CONFERENCE LOGO

The logo for the **4th International Conference on Integrated Natural Resources and Environment Management** (INREM 2023) depicts the salient elements of this year's theme, *Future-Proofing Sustainable Ridge-to-Reef Transformations through INREM.*" It captures the holistic, multi-dimensional, and interconnected approach of INREM as an invaluable framework in ensuring the sustainability of transformational adaptations to preserve the integrity of ecosystems from ridge to reef while simultaneously promoting societal development.

The logomark consists of a single image made from three distinct elements that either flow into or are contiguous with one another, symbolizing the interrelatedness of natural and human systems. The mountains and the green and brown waves represent terrestrial systems, particularly upland ecosystems, that seamlessly flow into and join the blue waves that represent coastal and marine ecosystems. The mountains are adjacent to and the waves are contained within a silhouette of a city and humans engaged in various economic activities in the form of a cross-section of a globe, which portrays economic development that is contingent upon the integrity of natural environments in the same way that environmental health depends on sustainable growth. Taken together, the logo depicts our collective aspiration for a balanced, dynamic, and co-dependent relationship between human and natural systems that can be sustained in perpetuity.


INREM 2023
4TH INTERNATIONAL CONFERENCE ON INTEGRATED NATURAL RESOURCES AND ENVIRONMENT MANAGEMENT
OSE V. CAMACHO, JR.
HANCELLOR
ARKS


Century Park Hotel


INREM 2023
4TH INTERNATIONAL CONFERENCE ON INTEGRATED NATURAL RESOURCES AND ENVIRONMENT MANAGEMENT

OVERVIEW OF THE CONFERENCE

Significant initiatives in advancing and mainstreaming integrated natural resources management, such as the United Nations 2030 Sustainable Development Agenda, UN Framework Conventions on Climate Change, and UN Convention on Biodiversity, have brought forth transformations in the global landscape. Sustaining these transformations requires proposing and implementing sustainable solutions using interdisciplinary, multidisciplinary and trans-disciplinary approaches for the agriculture, aquatic, environment, and natural resource sectors.

In order to package and promote the rich experiences in future-proofing and sustainable development through integrated natural resources and environment management (INREM), the University of the Philippines Los Baños - Interdisciplinary Studies Center for Integrated Natural Resources and Environment Management (UPLB-INREM) led the organization of a three-day international conference with the theme "*Future-Proofing Sustainable Ridge-to-Reef Transformations through INREM.*"

The 4th International Conference on INREM (INREM 2023), embarked on the following objectives:

1. Facilitate sharing of ideas and experiences on resilience-building, sustainable development and integrated management of agriculture, environment, aquatic and natural resources in the Asia-Pacific region;

2. Synthesize knowledge on integrated natural resources and environment management (INREM) of lake and river basins, landscapes and seascapes, small islands, and rural-urban areas and their interrelationships; and

3. Institute a network of professionals and practitioners/communities of practice among INREM stakeholders in the Asia-Pacific region.

More than 200 participants composed of early career and experienced researchers, professionals, practitioners, students, and other INREM stakeholders from state universities and colleges, research institutions, national and local government units, and civil society. The participants came from diverse regions including the Philippines, Indonesia, Vietnam, Japan, India, Ghana, Ethiopia, Germany, Netherlands, United Kingdom, and the United States.

The three-day conference featured nine (9) plenary sessions on various themes, including natural resources and environment management as the backbone of resilience; seascapes focusing on oil spill disasters; forest landscape governance;

building sustainable and resilience future of small islands; rural-urban linkages; environment and economics research; social decisions/socio-ecological systems; capacity development at multiple scales; and transformative education for INREM. There were eleven (11) parallel sessions for a total of forty-eight (48) research papers, and two special sessions for early career researchers presenting ten (10) undergraduate and four (4) graduate research papers.

In addition, there were twenty-two (22) poster presentations covering a wide range of topics, including policy and governance; socioeconomic analysis; biophysical assessment; pollution and environmental degradation; ecosystem-based adaptation and disaster risk reduction; and coastal and marine resources.

DAY I
(November 21, 2023)

OPENING CEREMONY

Dr. Juan M. Pulhin, chair of the UPLB-INREM welcomed the participants to the 4th International Conference on Integrated Natural Resources and Environment Management (INREM 2023) on 21 November 2023. Dr. Pulhin highlighted thatINREM 2023 was important as it marked the first post-pandemic gathering and officially established UPLB INREM as the affiliate hub of UPRI. In relation to the conference theme, he explained that the pursuit of sustainable development needs a scientific approach that generates viable solutions with an evidence-based, forward-thinking perspective, and that the path towards a resilient and sustainable future can be forged through the integration of scientific knowledge, collaborative efforts, and shared commitment to environmental stewardship.

In the opening remarks given by UPLB Chancellor Jose V. Camacho, Jr., he cited that the conference theme resonated strongly with UN Sustainable Development Goals and UPLB's AGORA Research Agenda. He found the theme grounded on the understanding that achieving sustainability needs a systemic approach, especially when it comes to environmental and ecosystem management considering the interconnectedness of the uplands, ridge ecosystems, to coastal ecosystems. He added that INREM 2023 was a venue for sustainability dialogue and encouraged the participants to work together toward a future-proof and sustainable environment paradigm for our reefs and ridges.

The heads of two conference partners, the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) and the Philippine Council for Agriculture, Aquatic and


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WELCOME REMARKS

Natural Resources Research and Development of the Department of Science and Technology (DOST-PCAARRD) gave inspirational messages.

Mr. Immanuel Gebhardt, GIZ Philippines Country Representative, highlighted that knowledge exchange is vital in the conference and paves way to shared understanding and exchanges among the researchers and practitioners. In relation to the conference theme, he said that ridge-to-reef is an integrated approach showing the interconnectedness between natural and social systems because in the end, it is not only the natural resources that matter but also the social context.

Dr. Reynaldo V. Ebora, executive director of DOST-PCAARRD, in a video message, shared his thoughts about the conference theme and the conference. He said that the theme encompassed the challenges and opportunities ahead for INREM stakeholders and that for PCAARRD foreseeing these challenges meant its mission has changed from aspirational to imperative. Charting a path on sustainable practices and scientific innovation towards creating healthier environments and communities also involve anticipating challenges such as habitat loss, declining biodiversity, and the looming effects of climate change. He added that the collective wisdom of conference participants would become a powerful force for positive change transcending beyond discussions and sharing of ideas.

Following the welcome remarks and inspirational messages was the Keynote Message of the Secretary of the Department of Environment and Natural Resources (DENR). Sec. Maria Antonia Yulo-Loyzaga was introduced by Associate Professor Marlo D. Mendoza, Dean of the UPLB College of Forestry and Natural Resources (UPLB-CFNR).

Sec. Yulo Loyzaga pointed out that the kind of science needed for the future that we want, is a science that takes a village. The village must be composed of individuals who are intellectually and spiritually generous with their work and with their passion. She emphasized that each of the village members needs to be each other's "katiwala" in order for us to do the kind of transdisciplinary work in terms of integrating our natural resources management efforts. She highlighted that to achieve the goal of sustainable development transcending future generations, we must foster strong collaborations – from local and international, across diverse sectors and disciplines. On the part of the DENR, the crucial role of academe in crafting climate-resilient development plans for our country is recognized, hence, the DENR has organized multi-sectoral advisory councils. She concluded that DENR is looking forward to new collaborations as well as initiatives to build a constituency for resilience, noting that the country's rich and diverse natural resources provide an opportunity to present nature-based solutions to the climate crisis.

LAUNCHING OF UPLB-INREM AS AFFILIATE HUB OF UP RI

One of the main events of the INREM 2023 was the launching of the UPLB-INREM as an affiliate hub of the UP Resilience Institute (UP RI), which was officially approved in the 1379th Meeting of the UP Board of Regents on 3 April 2023, where key officials of the UP System, UP RI and UPLB shared their insights.

Dr. Alfredo Mahar Francisco A. Lagmay, executive director of the UP RI talked about the resilience hubs that the UP RI has established across the Philippines, to harness the expertise in universities in facilitating resilience building in the communities. He said that in order to address the increasing impacts of climate change, there is a need for anticipatory planning across all sectors. Planning for resilience and disaster preparedness must be comprehensive and should not be simply planning for evacuation centers.

Chancellor Camacho for his part affirmed UPLB's recognition of the pressing need for interdisciplinary approaches to address the present complex environmental challenges, by bridging gaps between different fields of study. He added that UPLB-INREM's affiliation with UPRI underscores collaborative efforts across campuses to address the country's resilience challenges, positioning UPLB at the forefront of resilience research.

Finally, in a video message, UP President Angelo A. Jimenez said that the initiativein establishing UPRI hubs over the country is both visionary and practical and aligns with the long-standing commitment of UP to be the university of Filipinos. He added that UP must ensure remaining relevant and contributing to national development, addressing the myriad challenges our nation faces. He said: "We are not merely academicians or researchers, we are public servants tasked with translating our knowledge into tangible actions and services for the people – this is our calling. By working together, we can exert a more profound influence in the public sphere and foster national development."

SIGNING OF MEMORANDA OF UNDERSTANDING AND AGREEMENT

Signing of the MOU between DENR and UPLB. The MOU demonstrates the agencies' commitment to working together to attain the goal of a sustainable and resilient natural resources management and environment protection in the country, specifically focusing on the forestry sector. In UPLB, the organizations directly involved here are the Interdisciplinary Studies Center for Integrated Natural Resources and Environmental Management (UPLB-INREM), the College of Forestry and Natural Resources (CFNR) and the Forestry Development Center (FDC).

Signing of the MOA between UPLB and Don Mariano Marcos Memorial State University. The partnership is in relation to the implementation of the E-Asia Joint Research Project "Integration of Traditional and Modern Bioproduction Systems for a Sustainable and Resilient Future Under Climate and Ecosystems Changes (ITMoB)" being supported by the DOST-PCAARRD.

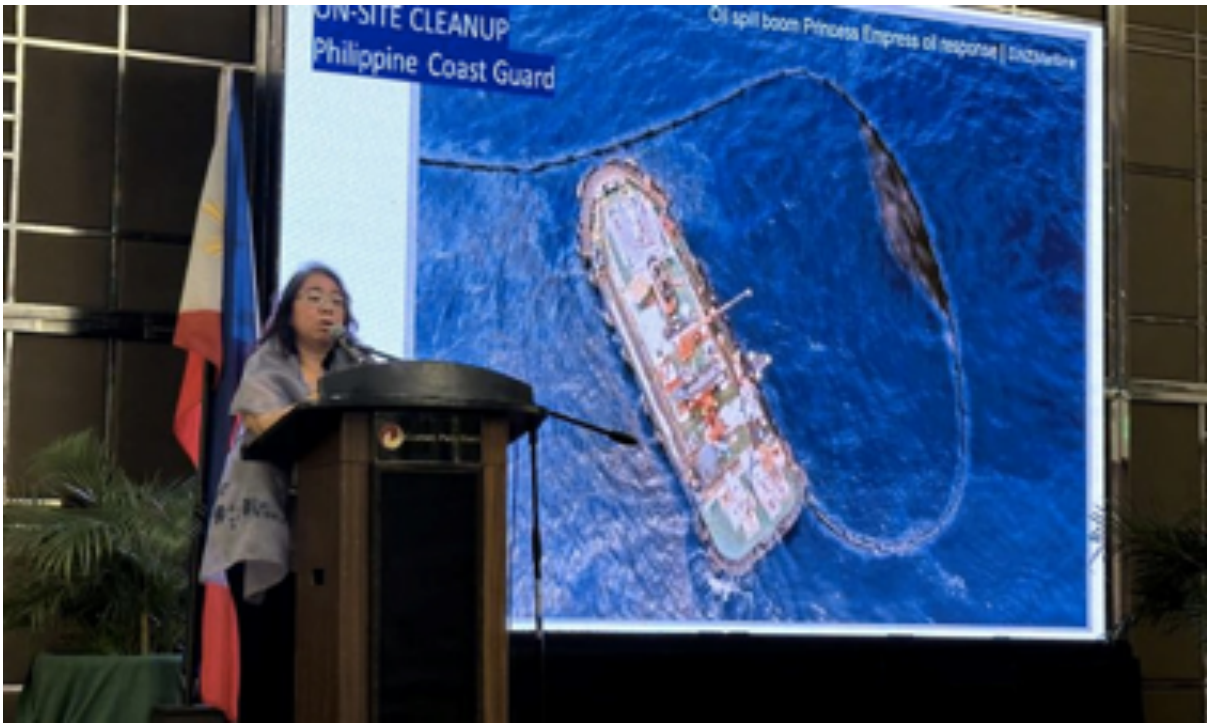
Signing of the MOU between UPLB and Palawan State University. The partnership is in relation to the implementation of the project "Natural Capital Accounting of Coastal and Marine Ecosystems in the West Philippine Sea," project 2 of the "Resource Inventory, Valuation, and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea" or RE-INVEST Program being supported by the DOST-PCAARRD.

Signing of the MOU between UPLB and Western Philippines University. The partnership is in relation to the implementation of the project "Natural Capital Accounting of Coastal and Marine Ecosystems in the West Philippine Sea," project 2 of the "Resource Inventory, Valuation, and Policy in Ecosystem Services under Threat (RE-INVEST): The Case of the West Philippine Sea" or RE-INVEST Program being supported by the DOST-PCAARRD.

PLENARY SESSIONS

PLENARY SESSION 1:
Seascapes Focusing on Oil Spill Disasters

Dr. Laura T. David



During the first plenary session, Dr. David, director of the University of the Philippines Marine Science Institute (UP MSI), focused on assessing the archipelago's overall preparedness for disasters such as oil spills. The initial response to oil spill disasters involved generating dispersal patterns to predict the areas with a high probability of "dispersal." According to her, there should be combined validation through satellite remote sensing, utilizing images from ESA/ NOA/Greenpeace, as well as on-ground validation including sampling coastal areas based on trajectory predictions, revealing areas with significant oil contamination (e.g., mangroves, beach forests, and areas with rocky substrate). She shared that the absence of data on the pre-incident state of natural habitats further complicates the assessment of damages and losses.

She highlighted the importance of technological developments that do not only address issues, but also improve the capacity of local stakeholders and institutions to better manage their environment and natural resources, including the Philippine waters. Technologies such as the ARRAS and Fish-I were cited as examples of modern tools that can bridge the gap between technical experts and the local people. She stressed the importance of readily available, relevant, accurate and

updated data for monitoring and rapid assessment that would improve the people's readiness and ability to adapt to issues.

Lastly, she pointed out the need for interdisciplinary collaboration for the national protection of natural resources, particularly in the quantification of the country's natural resources, as well as in the development of national policies. She added that engagement of dialogues for national protection of the country's resources is an imperative step towards environmental conservation in the country.

During the open forum, the need for a Coast Watch Center was discussed, especially considering the coastal and environmental nexus. The potential integration of findings of MSI into a Coast Watch Center for the Coast Guard, the benefit of a decision support tool, the Coast Guard's role in this center and other potential policy implications were articulated. There was also emphasis on the DENR enforcing policies related to the environment, particularly focusing on the ridge-to-offshore aspects, highlighting the importance of recognizing the Philippines as an archipelago. Correspondingly, this requires resources and initiatives by relevant authorities.

PLENARY SESSION 2:
Natural Resources and Environment Management as the Backbone of Resilience

Dr. Alfredo Mahar Francisco A. Lagmay

In his plenary presentation, Dr. Lagmay discussed how climate change is one of the major threats to the country's environment and natural resources.. Among the many climate change mitigation and adaptation strategies, he discussed Ecosystem-based approaches, which is also known as Ecosystem-based Adaptation (EbA), for this plenary talk. These includes a variety of activities that are aimed towards increasing the resilience and decreasing the vulnerability of people and the environment to climate change.

He said that for efficient and effective management solutions bear fruit, it is important to conduct planning in its design and implementation. Furthermore, all sectors need to be involved as these are all interconnected to one another. In addition to this, he explained that planning should not only involve the collection of past data, but also the analysis of future projections for risk assessment and management. To this UP RI, where he is the executive director, contributes by tapping experts to help communities plan and be resilient. For example, they aid local government units (LGUs) in the creation of comprehensive land use plants, local

climate change action plans, zoning ordinance etc. It is estimated that the UPRI has helped 30 to 40 cities/ municipalities.

He further stressed once more that planning is key and necessitates the involvement of all sectors. There needs to be a holistic and interdisciplinary approach to building resilience. He added that the climate change lens is important to be used. In the case of probabilistic risk assessment, climate change causes extreme weather events to be worse than the previous years. Thus, planning can not only rely on old hazard maps, but also maps that show different future scenarios. If every sector creates plans with a climate change lens then communities can become more prepared for future climate change impacts. It is through systems approach that communities become better and more resilient.

In risk assessment and management, he discussed the importance of considering future projections. It has been observed that major climate events have been stronger than what past data shows. Survivors always say that it is their first time experiencing such an event. Thus, it is important to examine the trend and include the analysis of future projections in management decisions.

PLENARY SESSION 3:
Integrated Natural Resources Management in the Context of Small Islands

Dr. Osamu Saito

In response to the growing threat that natural loss poses to the global gross domestic product, Dr. Saito said that the Kunming-Montréal Global Biodiversity Framework (KM-GBF) is one such response. It set 23 goals for stopping natural loss. In the Philippines, they need to update the strategies, plans, and programmes to match KM-GBF's goals. It is vital to protect wildlife and use natural resources in a way that doesn't harm the environment.

Dr. Saito discussed that invasive alien species, habitat loss, climate change, pollution, and overexploitation are some things that stress wildlife in the Philippines. Because of these causes, creative solutions are needed to protect people's health. He added that the project "Integration of Traditional and Modern Bioproduction Systems for a Sustainable and Resilient Future Under Climate and Ecosystem Changes (ITMoB)" was initiated to deal with these problems while simultaneously ensuring the delivery of critical ecological services.

The core objective of ITMoB is to create possible futures that are sustainable and adaptable in the face of changes in climate and ecosystems. The project was made possible by the work of public funding agencies from East Asia Summit member countries.

Further, he said that the Nature Futures Framework was used by the ITMoB project to delve into socio-ecological production landscapes and seascapes across Asia, mainly Japan, Indonesia, and the Philippines. Ninety case studies were collected and analyzed, identifying 348 solutions and 238 threats. The study emphasizes the

importance of considering multidimensional values in decision-making to create a sustainable future. However, evaluating the impact faced limitations, urging a call for consideration in future studies.

Among the success stories he highlighted were the Sado area in Niigata, Japan which was cited as the best example. In the Sado Island case, farming rice and protecting the endangered Japanese Crested Ibis harmonizes together in a way that benefits both the environment and the community. This shows that it is possible to use provisioning services while also protecting traditional landscapes and biodiversity.

He closed by stressing the importance of collaborative efforts, integrating traditional and modern bioproduction systems, strengthening co-design and co- production processes, implementing localized capacity development programs, and building a network of actions and projects are crucial for a transformation toward a resilient and sustainable future.

Forest Foundation Philippines Grants and Partnership Opportunities

The Forest Foundation Philippines (FFP) provides opportunities for research, development and extension through provision of grants and technical assistance to organizations and individuals. They endeavor to empower people to protect and conserve forests. They have made a commitment with its grantees and farmers to strive to protect and sustainably manage the forests for water, land and biodiversity while also fostering forest-related climate action

Four target outcomes of FFP:

Grow Forests – Enhanced forested landscapes that provide multiple ecosystem goods and services

Grow Opportunities – Improved multi-stakeholder engagement through sustainable livelihoods and incentives

Grow Partners – Strengthened cross-sectoral partnerships for sustainable forest management

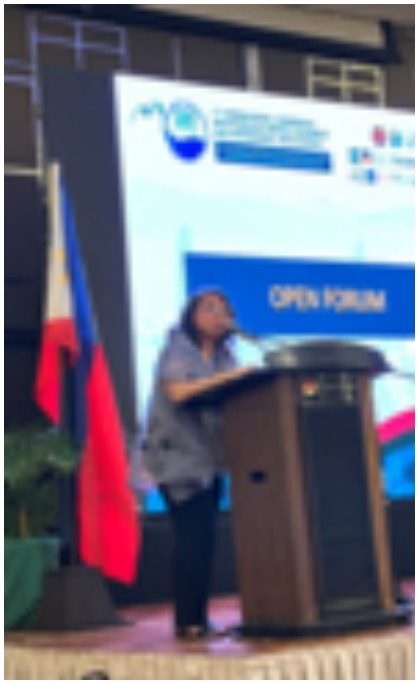
Grow Advocates – Enhanced knowledge management and strategic communications

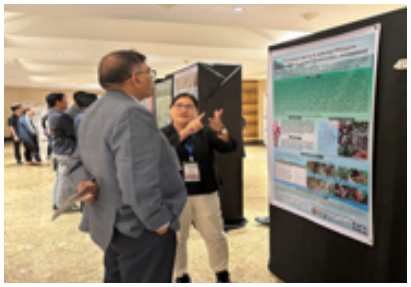
PHOTOS OF DAY 1










DAY 2
(November 22, 2023)

Day 2 started with a brief presentation of highlights of Day 1 delivered by Dr. Michelle Grace V. Paraso, Co-Chair of UPLB-INREM and Professor at the College of Veterinary Medicine.

PLENARY SESSIONS

PLENARY SESSION 4:
Rural-Urban Linkages: Challenges, Opportunities, and the Role of Nature-Based Solutions in Supporting Sustainable Ridge-to-Reef Transformations

Ms. Katrina Loraine Kendall

Ms. Kendall began with a discussion of Nature-based solutions (NbS), a term coined by the World Bank in 2008, is defined by the International Union for Conservation of Nature (IUCN) as "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits". The United

Nations Environment Assembly expanded the definition to incorporate marine freshwater ecosystems as well, not just environmental but social and economics. She said that NbS is an umbrella term that encompasses other terms such as ecosystem-based adaptation. Given this, it can help practitioners design and implement flexible solutions.

She explained that urban-rural linkages have many different linkages and dynamics. It refers to the flow of people, goods, information, capital, and services. Rural communities benefit from things such as the flow of energy and employment. On the other hand, urban centers benefit from the flow of food and water. Many cities have issues with food security, heat, sea level rise, growing disparity between urban and rural environments leads to compounding pressure on biodiversity. Thus, it is important to ask questions such as how do we ensure that development activities are conducted in a way that is good for people and not bad for nature? There is an opportunity to improve our situation given our vast knowledge to incorporate sustainable practices to support sustainable development through NbS. NbS can support sustainable development – promote social equity, human rights and development.

Majority of global risks arise due to damages in the environment, wherein some of these challenges have the same drivers and solutions due to their interconnectedness. She highlighted that NbS could help in providing transformative solutions that address several issues at the same time reduce exposure and vulnerability to risks. NbS is a way forward towards coordinated solutions as it unifies and recognizes synergies. Furthermore, it can serve as a guide to policy makers and unify multilateral agreements.

Despite the positives of NbS, it is not perfect. NbS has a number of different risks and there have been cases where it has been misused. Thus, it is significant to be able to conduct proper research in its planning and development stage. She closed by stressing that one such way of doing so is by ensuring that it is inclusive and incorporates Indigenous People and local communities in its development and implementation.

PLENARY SESSION 5:
Promoting the Sustainability of River Basins through Integration of Local, Provincial and Regional Development Plans

Dr. Rex Victor O. Cruz

Dr. Cruz narrated the current problems of the Philippines: deforestation resulting from unsustainable agriculture, unregulated urbanization, and industrialization. Fragmentation of development plans, he continued, is recognized as a problem in river basin management. In order to achieve sustainable and resilient watersheds

amidst differences in the interests of stakeholders in utilizing lands within river basins and the complex interconnectedness of its natural and managed ecosystems, he highly emphasized and recommended the use of Ridge-to-Reef/Watershed Ecosystem Management (R2R/WEM) approach has become a must in doing local land use planning initiatives. Horizontal and vertical integration of local development plans and programs of LGUs and NGAs can be facilitated through the suggested approach. He outlined the three basic steps in applying R2R/WEM:: 1) Delineating watersheds and identifying what uses benefit the watershed; 2) Sectoral planning; and 3) Integration of plans.

Among the challenges he discussed in using the R2R/WEM include capacitating local planners, improving the availability of datasets and maps, reforming policies, and establishing a mechanism of collaboration and integration among LGUs and NGAs. These challenges are imperatives that should be acted upon and "changing mindsets" may reinforce the solutions to these challenges. At present, the team of Dr. Cruz have made efforts in La Union and Laguna to institutionalize the R2R/WEM approach in provincial development planning.

The open forum after his presentation revolved around making an effort to educate, advocate, and raise awareness about integrating R2R/WEM approach in local planning. Critical here are inter-agency collaboration and exchange of information through communication and education so that parties concerned appreciate the approach and actively participate in the initiative.

PLENARY SESSION 6:
Environment and Economics Research Forum

The plenary session featured four (4) presentations on four (4) projects currently being implemented by the UPLB-INREM with support from the DOST-PCAARRD.

Developing Natural Capital Accounts for Coastal and Marine Ecosystems in the West Philippine Sea

Dr. Canesio D. Predo

Dr. Predo began by discussing how ecosystem services losses of coastal and marine ecosystems are under threat have to be fully accounted for in pursuing effective and sustainable management and utilization of the country's natural capitals. He discussed Ecosystem accounting, also called Natural Capital Accounting (NCA), serves as a tool that measures changes in stocks and conditions of natural capitals. Ecosystem accounting is also used for evidence-based policy- making. He believes that the results of the study can offer a systematic approach to environmental and natural resources monitoring, provide a scientific basis for sustainable policy decisions on natural resources utilization and environmental planning, and facilitate the improvement of livelihood and generation of other economic opportunities. Dr. Predo recommended that additional research is needed to fine-tune NCA methodologies, thereafter, capacity building of stakeholders must be done to build the ecosystem accounts.

Developing a Payment for Ecosystem Services Mechanism for Sustainable Water Provision: The Case of Barrobob Watershed, Northern Philippines

Dr. Asa Jose U. Sajise

Dr. Sajise explained that the project piloted a mechanism for the payment for water ecosystem services in the Barrobob Watershed in Nueva Vizcaya. He outlined how that through the use of this market instrument, water supply is expected to improve. He said that this is a relatively novel approach in environmental conservation. The pilot project implementation ensured that the mechanism is grounded in science, economics, and institutions – the three pillars of the Payment for Ecosystem Services (PES) mechanism. Dr. Sajise further claimed that the pilot study was critical to gaining valuable insight for the development of a national PES policy, stipulating the creation of PES mechanisms throughout the country.

Advancing the Science of Payment for Water Ecosystem Services (P-WES) Towards the Development of a National Policy

Assoc. Prof. Marlo D. Mendoza

Despite the fact that the Philippines began implementing PES and/or PES-like schemes in the early 2000s, Assoc. Prof. Mendoza said that most of these initiatives were short-lived and the policy that will institutionalize it in the country is still lacking. He discussed how P-WES project looked at the PES and PES-like initiatives and found that government and private groups take the lead s on this innovative approach to watershed management. He highlighted how the project addresses the need for a national PES policy that would harmonize existing policies, complement management interventions and institutionalize PES in the country.

Integration of Traditional and Modern Bioproduction Systems for a Sustainable and Resilient Future Under Climate and Ecosystems Changes (ITMoB)

Dr. Juan M. Pulhin

Dr. Pulhin discussed how climate, demography, and land cover changes are posing challenges to sustainable food production and resilience building. He discussed how the project highlights the potential to improve science-based and multi-stakeholder decision-making by integrating science and indigenous knowledge for ridge-to-reef governance. The ongoing action research found that modern bioproduction systems make use of technologies that favor the resiliency and sustainability of agricultural systems, but the challenge is how to strike the balance between urbanization and the development of bioproduction systems, and ensuring that synergies and trade-offs among ecosystem services result in optimal bioproduction systems combinations.

Discussed during the open forum are the following possible offshoot projects from the ongoing initiatives of UPLB-INREM:

ONGOING PROJECTS	POSSIBLE FUTURE INITIATIVES
Natural Capital Accounting of Coastal and Marine Ecosystems in the West Philippine Sea	1. Advocating the project outputs to be considered in the System of National Accounts 2. Further research on fine-tuning NCA methodologies 3. Capacity building on natural capital accounting from the local level to the national level to demonstrate how it can be used for conservation as well as damage claims
Research for Development: Payment for Ecosystem Services Outcome for Sustainable Water Provision (R4D: PESO SWaP) in Barobbob Watershed, Nueva Vizcaya, Philippines	1. Scaling up of PES at the national level, through a national PES policy 2. Pursuing local implementation and increased awareness about PES as an option for conservation
Assessment of Payment for Water Ecosystem Service (P-WES) Initiatives Towards the Development of a Philippine PES Protocol	1. Increasing the involvement of the private sector in P-WES initiatives 2. Policy Advocacy for the institutionalization of P-WES
Integration of Traditional and Modern Bioproduction Systems for a Sustainable and Resilient Future Under Climate and Ecosystems Changes (ITMoB)	1. Local policy advocacy – at present, there is an ongoing draft of a local resolution adapting the outputs of this project 2. Scaling up ITMoB at the national level

PARALLEL SESSIONS

PARALLEL SESSION 1A:
Resilience-Building and Future-Proofing Strategies in a Multi-Stressed Scenario in the Province of Albay, Philippines (APN Science-Policy Forum)

Session Chair: Dr. Rose Jane J. Peras
Documenters: Marielle R. Baliwag and Sheerah Louise C. Tasico

Presentations:

1. Institutional Capacity and Qualitative Visualization of Impacts in a Multi-Stressed Case: A Complementary Approach Towards Resilient Communities and Future-Proof Institutions in the Quinali A Watershed

   Maricel T. Villamayor, Associate Professor, Department of Social Forestry and Forest Governance (DSFFG), CFNR, UPLB
2. Flood Hazard and Risk Assessment of Quinali A Watershed

   Arge Louise Joy S. Esquivel, Science Research Specialist II, Nationwide Operational Assessment of Hazards (NOAH) Center, UP RI
3. Multi-hazard Assessment Using Geospatial Analysis in Quinali A Watershed

   Jerico E. Mendoza, Chief Science Research Specialist, NOAH Center, UP RI
4. Monitoring of Land Cover Changes and Landscape Fragmentation in Quinali A Watershed, Albay Province

   Gifford Jay L. Agudo, Junior Research Assistant, NOAH Center, UP RI

   Josephine E. Garcia, University Extension Specialist III, Institute of Animal Science, College of Agriculture and Food Sciences, UPLB

Key takeaways:

1. Albay is considered a "disaster paradise." Its geographical location makes it vulnerable to a multitude of challenges including biophysical and institutional fragmentation.
2. The landscape is characterized by uncertainties. It is crucial to build resilient communities and have future-proofing measures.
3. There is a need for a participatory approach - collaborating with experts and capacitating communities.

PARALLEL SESSION 1B:
South-South Exchange on Climate Information Services in Agriculture and Energy

Session Facilitator: GIZ South-South Collaboration on Climate Information Services (SSCIS) Team
Documenter: Mylene M. Claudio

Presentations:

1. Developing Solutions for Scaling Up Climate Smart Agriculture (CSA) in the Coastal Areas of the Red River Delta

   An The Ngo, Faculty of Natural Resources and Environmental Science, Vietnam National University of Agriculture
2. Cultural and Gender Dimensions of Climate Change on Vulnerable Coastal Communities in Ghana: Mitigations and Cautions

   Georgina Y. Oduro, Department of Sociology and Anthropology, University of Cape Coast, Ghana
3. Progressing the Implementation of Long-Term Climate-Energy Strategies through Science-based Methods: The Case in the Philippines

   Jericho Jan E. Andres, Graduate student, MS in Energy Engineering, National Graduate School of Engineering - University of the Philippines Diliman

4. SMS-based Climate Information Service for Yellow Corn Farmers in Isabela Province, Philippines

   Orlando F. Balderama, Professor, College of Engineering, Isabela State University-Echague Campus

5. Apply Digital Shoreline Analysis System (DSAS) for Riverbank Erosion and Accretion Assessment of the Hau River in the Vietnamese Mekong Delta

   Nguyen Luyen Phuong Doan, Researcher, Research Institute for Climate Change (DRAGON-Mekong Institute) at Can Tho University

6. Empowering Climate Resilience: AP-PLAT and Its Innovative Tools Adaptation

   Yuji Masutomi, Section Head, National Institute for Environmental Studies

7. Agroecology Making Ecosystem-Based Adaptation Work in Agricultural Landscapes

   Maike Voss, Advisor for the GIZ Sector Project Rural Development

Key Takeaways:

1. Climate Information Services have a wide range of application and can be made accessible to a diverse set of users through the recognition of local language, acceptance by stakeholders, integration with other government support services, and proper communication of scientific findings that are understandable to users and stakeholders.

2. It is crucial to involve local stakeholders at different phases of the project and should be viewed as actors in the system and not just as beneficiaries and end-users.

3. Dr. Pulhin was able to summarize the session through "SSCIS": Science, Stakeholder Engagement, Communities of Practice, Information, Systemic Perspective, and Societal Impact. These factors are of great importance to ensure the success of climate information services in the country.

PARALLEL SESSION 1C:
Landscapes and Seascapes

Session Chair: Dr. Edgar M. Reyes, Jr.
Documenters: Pia C. Montoya and Joylyn Bon O.L. Yu

Presentations:

1. Uncovering the Challenge: Assessing Deforestation and Forest Degradation in the Southern Sierra Madre, Philippines

   Marie Jessica C. Gabriel, Assistant Professor, IRNR, CFNR, UPLB

2. Groundwater Vulnerability Indicator Assessment of Karst Island Water Resources: Enhancement of the Freshwater Lens Assessment Protocol

   Robert Michael DiFilippo, Assistant Professor, National Institute of Geological Sciences, UP Diliman

3. Mangrove Extent Mapping using Different Mangrove Vegetation Indices and Sentinel-2 for Ecosystem Accounting in Occidental Mindoro, Philippines

   Adrian Pablo V. Sasi, University Research Associate II, UPLB-INREM

4. Traditional Practices and Use of Natural Resources for Livelihood Sustainability in Mizoram, India

   Vishwambhar Prasad Sati, Senior Professor, Mizoram University

5. Visitor Carrying Capacity of Malabrigo Beach, Lobo, Batangas, Philippines

   Donnabel E. Hintural, Science Research Specialist II, DENR-Ecosystems Research and Development Bureau

6. Beach Characterization and Suitability Assessment of Sea Turtle Nesting Sites in Naic, Cavite

   Glenn Bryan A. Creencia, Designated Faculty Researcher, Cavite State University

Key takeaways:

1. Landscapes and seascapes are exposed to a wide variety of social, economic, and environmental issues. Furthermore, the interactions people have in these environments are significant towards shaping an area's future. Thus, contextualization is a significant step in the analysis and development of solutions.

2. The papers presented showed various ways forward toward the sustainable management and development of an area's natural resources. There were also a number of papers that reflected changes in pre- and post- pandemic periods.
3. A multitude of methods were used by the presenters. These ranged from geographic information systems, ground truthing, and focus group discussions.

PARALLEL SESSION 1D:
Small Islands

Session Chair: Dr. Victor S. Ticzon
Documenters: Angelica T. Magpantay and Grace Ann C. Malolos

Presentations:

1. Conservation Priorities for Small Island Ecosystems in the Philippines

   Juan Carlos T. Gonzalez, Professor, CAS, UPLB
2. Land Cover Characterization and Water Quality Assessment of the Sambunotan Watershed, Dinagat Islands in Support of the Development of the Watershed Management Plan

   Stephanie Mae Salcedo-Albores, Faculty, Department of Civil Engineering, Caraga State University
3. Hydrological and Geologic Assessment of the Sambunotan Watershed for Sustainable Resource Management

   Arnaldo C. Gagula, Director, Caraga Center for Geo-informatics, Caraga State University

4. Evidences of Sea Level Rise in Siargao Group of Islands: The Case of Del Carmen Municipality

   Grace Anne C. Buno, University Research Associate I, Department of Community and Environmental Resource Planning (DCERP), CHE, UPLB

5. Development of SANDATA (Safeguard Against Natural Disasters of Academes Through Actions): A Strategic Communication Model on Disaster Risk Management for Higher Education Institutions in the Province of Occidental Mindoro

   Leomar Christian G. Nielo, Graduate Student, Graduate School, University of Santo Tomas

6. Maritime Disaster Risk Reduction Management Strategies: A Case Study of Mindoro Oil Spill

   Mary Joy J. Ancheta, Teaching Associate, Department of Community and Environmental Resource Planning, CHE, UPLB

Key takeaways:

1. Given that small islands are particularly vulnerable to the effects of climate change such as extreme weather events and sea level rise and environmental degradation, it is crucial to develop tailored frameworks, strategies, and measures for the management of the islands' natural resources.
2. The increasing number of baseline studies underscores the importance of these crucial inputs in creating a science-based integrated watershed management plan and shaping sound policies.
3. Disasters are driven by poorly managed resources highlighting the necessity of implementing nature-based solutions to tackle this issue.

PARALLEL SESSION 1E:
Rural-Urban Linkages

Session Chair: Dr. Josefina T. Dizon
Documenters: Dannica Rose G. Aquino and Karen M. Pajadan

Presentations:

1. Trading Green for Gold: The Lived Experiences of Migrant Indigenous Peoples with Large- Scale Mining Operations in Runruno, Quezon, Nueva Vizcaya, Philippines

   Aureneil C. Natividad, University Research Associate, DSFFG, CFNR, UPLB

2. Policy Implication of Drought's Cascading Effects on Sustainable Livelihoods and Natural Resource Management in South-Central Mindanao, Philippines

   Lorena L. Sabino, Assistant Professor, DSFFG, CFNR, UPLB

3. Climate Resilient Farming and Sustainability: Evidences from Osmanabad District of Maharashtra State of India

   Ashwini Pandhare, PhD Scholar, School of Rural Development, Tata Institute of Social Sciences

4. Resiliency to Farming Shocks of Upland Farming Communities in Isabela, Philippines

   Maria Theresa Nemesis P. Ocampo, University Researcher, Institute of Agroforestry, UPLB

5. Gender Roles on Point: Analysis of Resource Use Practices among Migrant *Aeta People in Cadaclan*, Pantabangan, Nueva Ecija, Philippines

   Justine A. Marasigan, Teaching Associate, DSFFG, UPLB

Key takeaways:

1. Ecosystems play an important role in providing goods and services that can shape the way of life of humankind. The Rural-Urban Linkages papers highlight cases of how gender roles and socioeconomic needs of indigenous peoples may evolve with the changes occurring in the natural environment.
2. Indigenous people, farming resilience and drought are interactions among the different components of ecosystems that demonstrate that the economy is not a separate dimension but an integral part of environmental systems.
3. Involvement of the community in the development and implementation of the initiatives increase their understanding of the concepts and technologies that could lead to a higher chance of adoption of targeted beneficiaries.

PHOTOS OF DAY 2

DAY 3
(November 23, 2023)

PLENARY SESSIONS

PLENARY SESSION 7:
The Role of Spatial Decision Support System in Future-Proofing Tropical Forest Landscapes

Dr. Melvin Lippe

Dr. Lippe stated that spatial problems require spatial solutions and there is an increasing availability of spatial tools beginners to advanced practitioners can use. When combined with participatory and stakeholder-driven approaches, Spatial Decision Support Systems (SDSS) can serve as a powerful instrument in future proofing tropical forest landscapes. He stressed on the importance of integrating science and grounded/local knowledge of the areas when conducting spatially explicit research as these two when done separately often produce varying results. He expressed the need for on-ground consultation validation as a means to

understand the situation better to avoid top-down policies that may not resolve on-ground problems.

Dr. Lippe shared that Project Citizen-SDSS, which is a combination of various approaches and SDSS to foster nature-based solutions to sustain and expand the forest landscapes of the Philippines, was initiated and is currently being implemented in partnership with different SUCs and NGO. The partners include Isabela State University, Visayas State University and Forest Foundation Philippines.

The presentation of Dr. Lippe further highlighted that in a world that is increasingly connected and complicated, integrated solutions and capacity-building to train the agents of tomorrow's solutions is a must.

PLENARY SESSION 8:
Sustaining Ridge-to-Reef Transformation through Capacity Development at Multiple Scales

Dr. Linda Anne Stevenson

Dr. Stevenson stressed that capacity building is needed for sustainable transformation to take place at a multiple scale, and is crucial in enhancing stakeholder knowledge and understanding, fostering collaboration and integrated management approach, and advancing governance. She shared that one of the

programs of APN is the Scientific Capacity Development Programme (CAPable), which aims to enhance the capacities of scientists, stakeholders, and decision-makers, and foster innovative solutions in the Asia Pacific Region, especially in developing countries. Individual-based, network- based, and societal governance (system level) capacity developments are the three main focus areas of the program.

She further discussed how sustainability and replicability of environmental management efforts require multi-stakeholder approaches. Governing bodies, researchers, communities, and individuals have to be involved in these efforts. As such, social preparation, participation, involvement, and trust are crucial. For their part, APN provides robust frameworks that foster multi-scale levels of involvement and stakeholder ownership in environmental management initiatives.

Among the APN projects she showed in her presentation are: a) Integrated Flood Management Plans aimed at strengthening the capacities of authorities to create flood management plans and integrate such plans with disaster preparedness plans; b) Enhancing capacities of local stakeholders in carbon ecosystems for climate mitigation and adaptation; and c) Integrated assessment of nature-based treatments.

PLENARY SESSION 9:
Transformative Education for Integrated Natural Resources and Environment Management

Dr. Cora van Oosten

Dr. Cora van Oosten reflected on the keynote message of DENR Secretary Yulo-Loyzaga about us being "katiwala" of environment and natural resources. We aim to be a society of "katiwala" – we are entrusted to be stewards of the environment and think of solutions for the environmental challenges we are facing. Being a "katiwala" entails us not just learning the simple issues but also the complex issues and how to navigate them. The complexities in addressing this intricate web of interconnected environmental issues are not something we learn from school. Thus, transformative education might be the missing link to becoming a society of stewards.

One of the points she emphasized during her talk was the relationship between the level of education an individual acquires and their behavior towards sustainability, where a graph shows that the higher the education one acquires, the less sustainable one behaves. She proposed the need to unlearn unsustainable practices as argued by Arjen Wals and then relearn sustainability practices which require changing roles – making the learners as co-creators of knowledge and the educators as facilitators and help learners discover and dream of creating a better world as "katiwala".

Dr. van Oosten presented three opportunities for change. First, transformative education is a novel and powerful tool which puts the learners at the center and

guides them from problem analysis to solution thinking. Second, new technological options are available giving rise to edu-technology where there is a blend of online and offline learning which connects the local to the global action networks. Lastly, with the emergence of new market players, education is no longer exclusively offered within schools and universities. Various innovative learning processes are available especially through digital campuses which offer both formal and informal education to all ensuring life-long learning. Phrasing from the ridge-to-reef jargon, the aim is to transfer the upstream changes in knowledge to downstream changes in stewardship on the ground.

PARALLEL SESSIONS

PARALLEL SESSION 2A:
Undergraduate Research Presentations

Session Chair: Dr. Virginia C. Cuevas
Documenters: Marielle R. Baliwag and Sheerah Louise C. Tasico

Presentations:

1. Analyzing People's Organization Sustainability Indicators and Roles in Natural Resource Management: A Case Study of Ned Landcare Association, Lake Sebu, South Cotabato, Philippines, *Louise Bernadette C. del Castillo*
2. Resiliency and Perception about Climate Change amid Multiple Hazards of Barangay Calangay, San Nicolas, Batangas, Philippines, *Toni Rose Villanueva*
3. Effects of COVID-19 Pandemic on the Livelihood and Forest Condition in a CBFM Area in Barangay Buenavista, Bayombong, Nueva Vizcaya, Philippines, *Lyra Mae A. Puno*
4. A Narrative Inquiry into the Vision of Seasoned Foresters on the Future of Philippine Forestry, *Dezcery Valeña*
5. Comparison of Mangrove Reforestation Programs in Two Coastal Barangays in Lucena City, Quezon Province, Philippines, *Neslyn Faith P. Aclan*
6. Mangroves Enhancing Local Climate Resilience: The Case of Olo-olo Mangrove Forest and Ecopark, Lobo, Batangas, *Alexa Samantha Hernandez*
7. Urban Mangroves Promoting Local Climate Resilience: A Closer Look at Tanza Marine Tree Park, Manila Bay, Philippines, *Andreana Cole R. Bravante*

8. The Recreational Value of the Manila Baywalk Dolomite Beach, Philippines, *Kevin Daryl M. Abregana*
9. Assessment of Normalized Difference Vegetation Index and Land Surface Temperature in Santa Rosa Watershed Using Satellite Imagery, *Diego Miguel Corañes Sapnu*
10. Assessment of the Embryotoxic and Teratogenic Effects of Local Water Samples on the Craniofacial Cartilage Structures and Development of Zebrafish, Danio rerio, *Jennifer G. Bulil-lit*
11. Low-Density Polyethylene (LDPE) and Polylactic Acid (PLA)-Degrading Bacteria Isolated from a Landfill In Brgy. Barobo, Valencia City, Bukidnon, *Kristina Casandra L. Pava*

Key takeaways:

1. The presentations highlighted topics connected to science, economics, and institutions.
2. The approach to address environmental problems is complex, integrated, interconnected, and holistic.
3. Local initiatives towards climate change resiliency should be sustained and strengthened.

PARALLEL SESSION 2B:
Lakes and River Basins

Session Chair: Dr. Noel G. Sabino
Documenters: Dannica Rose G. Aquino and Karen M. Pajadan

Presentations:

1. Integrated Flood and Sediment Management in River Basins for Sustainable Development: The Case of Cagayan River Basin

   Orlando F. Balderama, Professor, College of Engineering, Isabela State University-Echague Campus

2. Sediment Retention Ecosystem Service Valuation in San Cristobal River, Laguna, Philippines

   Annie Mae I. Inson, Economic Development Specialist I, National Economic Development Authority Region IV-A

3. Unraveling Emerging Microbial Threats in the Waters and Aquaculture of the Seven Lakes of San Pablo Exposes Activities on Land

   Ronilo Jose D. Flores, Associate Professor, CAS, UPLB

4. Water Quality Modeling Using STELLA to Simulate Dissolved Oxygen, Biological Oxygen Demand and Fish Kill Occurrence in Sampaloc Lake of San Pablo, City

   John Vincent R. Pleto, Assistant Professor, Institute of Biological Sciences, CAS, UPLB

5. Empowering Fisherfolk Communities through Participatory Research: Exploring Water Health Challenges in Lake Palakpakin, San Pablo, Philippines

   Romella T. Beringuela, Assistant Professor, CAS, UPLB (presented on her behalf by Joshua Jomao-as)

6. Bridging Ecology and Economy: Harnessing Payments for Ecosystem Services in the Cagayan de Oro River Basin, Northern Mindanao, Philippines

   John C. Naelga, Project Coordinator, Cagayan de Oro River Basin Management Council

7. Participatory Vulnerability Assessment and Qualitative Visualization of Impacts in a Multi- Hazard Scenario towards Effective Adaptation and Resilience of Select Barangays in the Quinali A Watershed in Albay

   Kyle Vincent R. Singson, University Research Associate I, UPLB-INREM

Key takeaways:

1. Any project should consider the community perspective since the people have the knowledge of ground realities, thus the local communities should be engaged at the earlier stages of project design and development.
2. Information dissemination and capacity building activities in research projects are crucial for stakeholders to enhance their knowledge and understanding of issues and how this can be addressed by science-based solutions.
3. Policy recommendations from applied research projects can guide decision makers from government units to craft more sustainable management initiatives.

PARALLEL SESSION 2C:
Hazards and Risk Assessment, Disaster Risk Reduction, and Climate Change Initiatives Towards Future-Proofing, Sustainability, and Resiliency

Session Chair: Assistant Prof. Genaro A. Cuaresma
Documenters: Jerzyne Anne A. Corpus, Franklin Joshua G. Gali, Jonathan David M. Maligalig, and Hazel M. Victoriano

Presentations:

1. Mindanao 2045: Exploratory Scenarios of Exposure Systemic Risks to Cascading Hazards

   Likha G. Minimo, Director, Knowledge Sharing Division, UP RI
2. Earthquake Readiness and Preparedness: The Case of UP Diliman and Units' Assessment of the Nationwide Simultaneous Earthquake Drill (NSED)

   Daffodil C. Cleto, Science Research Specialist II, Institution Building Division, UP RI
3. Prospects of Green Growth within the Context of Climate Emergency in the Philippines

   Dennis G. de la Torre, Chief Science Research Specialist, Research and Creative Works Division, UP RI
4. Urban Ground Deformation in Philippine Metropolitan Cities from 2014 to 2022

   Jolly Joyce Sulapas, Junior Managing Researcher, NOAH Center, UP RI

5. The Philippine Preparedness Partnership as a Model for a Multi-Sectoral Approach to Addressing Disaster Risk

   Lea Victoria Serrano, Researcher, Education Division, UP RI

Key takeaways:

1. Planning is very important. The challenge now is that to plan not only for the communities but on higher levels as well.
2. The need to be guided by the Sendai frameworks and DRRM Act of 2010 which identify the four (4) pillars of DRRM, and to follow international standards and probabilistic risk assessment.
3. Better preparation would have prevented and mitigated the damaging effects of hazard, leading to less need for response and recovery.

PARALLEL SESSION 2D:
Future-Proofing Coastlines through Our Coastal Greenbelt Zones: A Panel Dicussion on Mangrove Conservation

Session Facilitators: Atty. Nikka Oquias and Dr. Victor S. Ticzon
Documenters: Christian Ray C. Buendia and Grace Ann C. Malolos

Video Messages

1. Legislating protection measures for coastal greenbelts towards future-proofing coastlines

   Sen. Cynthia A. Villar, Senator of the Philippines

   Cong. Edgar M. Chatto, Representative, 1st District, Province of Bohol

Presentations

1. The critical role of mangroves in coastal conservation

   Dr. Jurgenne Primavera, Zoological Society of London
2. Future-proofing Mangrove Governance

   Dr. Dixon Gevaña, Professor and UP Scientist, UPLB 2018 DOST-NAST Outstanding Young Scientist
3. Economic implications of mangrove degradation and restoration

   Dr. Rico Ancog, Dean of UPLB-SESAM 2019 DOST-NAST Outstanding Young Scientist 2022 TOYM
4. Current policy initiatives and challenges in mangrove conservation

   Assist. Dir. Armida Andres on behalf of *Asec. Marcial Amaro*, Director, Biodiversity Management Bureau

5. Community-based management actions for mangrove ecosystems in the Philippines

   Ely Heis on behalf of *Roberto Ballon*, 2021 Ramon Magsaysay Awardee

6. Advocacy efforts for mangrove protection

   Atty. Gloria Estenzo Ramos, Oceana

   Kisha Muaña on behalf of *Dr. Annadel Cabanban*, Wetlands International Philippines

Key takeaways:

1. Mangroves occupy a vital role in ecosystem services provision, including coastal protection, carbon sequestration, waste assimilation, and ecotourism. However, coastal greenbelts face threats that require proactive and immediate action to ensure their survival.
2. Current and future protective measures for mangroves include policy/legislative initiatives (e.g., House Bill 7767 or the Coastal Greenbelt Bill and an EO on Nature-based Solutions); promotion of local mangrove initiatives and champions; community-based management actions; and advocacy efforts for mangrove protection.
3. Such efforts notwithstanding, much work is needed to advance initiatives to protect and rehabilitate coastal greenbelts to address gaps in science and policy, ensure tight coordination among government agencies, and account for foundational problems surrounding mangrove utilization, protection, and conservation.

PARALLEL SESSION 2E-1:
Advancing Environmental Stewardship and Sustainability in the Philippines: Innovations in Coastal and Marine Carbon Accounting, Conservation, and Natural Capital Accounting Frameworks, and Ecosystem-Based Disaster Recovery

Session Chair: Dr. Gem B. Castillo
Documenters: Joylyn Bon O.L. Yu and Adrian Pablo V. Sasi

Presentations:

1. Accounting of Carbon Pools in the West Philippine Sea Region Using Advanced Earth Observation Techniques

   Arnan B. Araza, Wageningen University and Research, The Netherlands
2. Sukat ng Kalikasan: Implementing the High Conservation Values (HCV) - Natural Capital Accounting (NCA) Framework for Sustainable Conservation in Protected Areas of the Philippines

   Freddie Palermo, USAID SIBOL
3. Green Assessment and Recovery: An Innovative Ecosystem-Based Approach to Post-Disaster Recovery and Resilience

   Jennie Masigan, USAID SIBOL

Key Takeaways:

1. Unfortunately, the environment tends to be pushed aside in comparison to other sectors. Thus, it is significant to be able to provide research and data that gives those in power a reason to prioritize environmental conservation.

2. The use of multiple approaches, e.g., GIS, ground surveys, and natural capital accounting, and the development of frameworks, e.g., Green Assessment Framework and the Green Recovery Program, can raise awareness on the value of the environment.

PARALLEL SESSION 2E-2:
Harmony in Action: Sustainable Management Strategies for Integrated Natural Resources and Landscape Restoration

Session Chair: Dr. Pastor L. Malabrigo, Jr.
Documenters: Joylyn Bon O.L. Yu and Adrian Pablo V. Sasi

Presentations:

1. The San Roque Multipurpose Project: A Sustainable Strategy for Integrated Natural Resources and Environment Management

   For. Tommy T. Valdez, Vice-President for Corporate Affairs, San Roque Power Corporation
2. Climate-Resilient Landscape Restoration Approaches: An Examination of Proven Strategies Implemented by the Alsons Power Group

   Casimiro V. Olvida, Watershed Program Manager, Conal Holding Corporation/ Alsons Power Group

Key Takeaways:

1. The private sector has different initiatives towards environmental conservation. Their projects have been able to help various communities through flood control and provision of livelihood activities..
2. 2. Collaboration with the private sector can open up opportunities for environmental conservation activities.

PARALLEL SESSION 2F-1:
3-Minute Graduate Research Presentations

Session Chair: Dr. Edgar M. Reyes, Jr.
Documenters: Laizha Lynn C. Lomente and Pauline Cielo P. Palma

Presentations:

1. Climate Change Impacts on Rural Communities and Out-Migration in Kalaburagi, Karnataka, India

   Praveen Naik Bellampalli, PhD Scholar, Tata Institute of Social Sciences
2. Typhoon-Induced Changes in Mangrove and its Impact on Livelihood Resources in Palawan, Philippines

   Pia C. Montoya, Graduate Student in Master of Science in Natural Resources Management, Asian Institute of Technology
3. An Assessment of Quezon City's In-City Socialized Housing Program in Creating Slum-Free Communities and Upgrading the Living Conditions of Informal Settler Families

   Raisa Vera Tayaban, Master in Public Management Student, Ateneo De Manila University
4. Forest Restoration Monitoring Using Cloud-Based Techniques Critical Watersheds in the Philippines

   Kyle Pierre R. Israel, Assistant Professor, DCERP, CHE, UPLB

Key Takeaways:

1. The parallel session is an avenue for MS and PhD students to present the findings of their studies and to gather as much attention to INREM-related matters.

2. There is a need for integrative and collaborative approaches and a balance between the bio-physical, economic and social aspects in addressing INREM-related issues and problems.
3. The studies presented provided inspiration and solutions to existing environmental issues and problems. The best practices that we can derive from the presentations could be replicated in other areas facing comparable problems. It is important also to collaborate and form synergies with relevant actors and stakeholders and engage the community in project implementation.

PARALLEL SESSION 2F-2: Integration of Traditional and Modern Bioproduction Systems for a Sustainable and Resilient Future Under Climate and Ecosystems Changes (ITMoB)

Session Chair: Dr. Cristino L. Tiburan, Jr.
Documenters: Laizha Lynn C. Lomente and Pauline Cielo P. Palma

Presentations:

1. Enhancing Multitemporal Land Cover Mapping Accuracy through Cloud-Based Remote Sensing: A Study of Image Compositing and Data Fusion in the Pagsanjan-Lumban and Baroro Watersheds

   Angelica T. Magpantay, University Researcher/DOST-SEI CIP Fellow, UPLB-INREM
2. Evolution and Future Trajectories of Bioproduction Systems and Ecosystem Services in Contrasting Landscapes

   Nico Almarines, Assistant Professor, IRNR, CFNR, UPLB

3. Modeling Habitat Quality for Sustainable Coexistence with Nature in the Bioproduction Landscapes of the Philippines

   Mesfin Sahle Achemo, Research Fellow, Institute for Global Environmental Strategies

Key Takeaways:

1. Cloud-based remote sensing is revolutionizing earth observation data, transforming knowledge into 'pixels of knowledge' for societal and future benefit.
2. Habitat quality impacts biodiversity and ecosystem balance, requiring sustainable planning, conservation strategies, community engagement, and climate-resilient strategies.
3. There are studies on ecosystem services and land cover change, but only limited studies on bioproduction systems. Historical modeling is essential for assessing spatial patterns and analyzing ecosystem services through InVEST.

POSTERS PRESENTED

1. Valuation of Water Supply as an Ecosystem Service in the Sub-Watersheds of the Upper Pampanga River Basin Using the InVEST Model

   Diorella Mari T. Garcia, University Research Associate II, Forestry Development Center, CFNR, UPLB
2. Toxicity Testing of Polypropylene (PP) Microplastics Using Brine Shrimp and Zebrafish Models

   Jessica R. Francisco, DOST CIP Fellow, Institute of Biology, UP Diliman
3. Taxonomic Survey of Phytoplankton Community in the 7 Lakes of San Pablo: Potential New Records in Philippine Lakes with Notes on New Local and Geographic Distribution

   Lawrence Victor D. Vitug, Project Technical Assistant III, UPLB
4. The First Report of Salmonella sp. in Farmed Tilapia (Oreochromis sp.) of Mohicap Lake, San Pablo Laguna, Philippines

   Joshua G. Jomao-as, Senior Science Research Specialist, UPLB
5. Coliform Level and Prevalence of Putative Escherichia coli O157:H7 on the Surface Waters of Lake Bunot, San Pablo City, Laguna, Philippines

   Jonnel P. Dioso, Graduate Student, UPLB
6. Utilization Insights from Southern Luzon Locals: Exploring Underutilized Philippine Native Fruit Tree Species

   Giorjia Mae L. Veran, University Research Associate, CAFS/CFNR, UPLB

7. Post-Disaster Recovery Assessment of Mangrove Forests in Leyte Island, Philippines Using,Sentinel-2 Imagery

   Allen Glen Cumaya Gil, MS Environmental Science Graduate, SESAM, UPLB

8. Does Family Approach Champion Social Equity Among Indigenous Peoples?: Experiences of Migrant Aeta Communities with the National Greening Program Implementation

   Aureneil C. Natividad, University Research Associate, DSFFG, CFNR, UPLB

9. Pamamahay at Paglalakbay: Narratives on the Role of Forest Conservation Projects in the Placemaking of the Ditao Indigenous Farmers Association in Cadaclan, Pantabangan, Nueva Ecija, Philippines

   Krisandra A. Mariano, Instructor IV, DSFFG, CFNR, UPLB

10. How Far It Goes?: Geographical Flow of Selected Bamboo Furniture and Handicrafts in Pangasinan, Philippines

    Ma. Diana DM. Rendon, Project Technical Assistant III, UPLB

11. Bamboo Fiber: A Potential Alternative to other Natural Textile Fibers in the Philippines

    Graciella Marie A. Zalameda, Project Technical Assistant III, UPLB

12. Humane Forest Landscape: Forest Restoration Approach in San Mariano, Isabela

    Aegirine Rei M. Taylan, College Graduate, University of the Philippines Diliman (presented on his behalf by Ms. Hazel Grace R. Esmino)

13. ReCab: A Proposed Post-Rehabilitation Development for the Former Cabanatuan City Dumpsite through Integrated Landscape Approach

    Hazel Grace R. Esmino, Student, University of the Philippines Diliman

14. Defining the Cultural Ecosystem Services of Selected Manila Urban Green Spaces through a Landscape-based Co-Assessment Framework

    Jose Maria Raul Baens Boncan, Bachelor in Landscape Architecture Graduate, College of Architecture, University of the Philippines Diliman

15. Threatened Plants in Selected Philippine Key Biodiversity Areas: A Preliminary Assessment

    Leilani A. Castillo, University Researcher III, UPLB

16. Comparative Assessment of Plant Diversity between Sipit and Tigbi Long Term Ecological Research Plots (LTERP), Mount Makiling Forest Reserve ASEAN Heritage Park, Philippines

    Manuel L. Castillo, Professor, UPLB (presented on his behalf by Myranel Salvador-Canceran)

17. Carbon Stock Estimation of Agos River Basin Using the Carbon Storage and Sequestration Model of InVEST

    Pocholo Jairus Miguel Venido P. del Rosario, University Research Associate, CFNR, UPLB

18. Assessing the Impacts of Land Capability Zoning on Sediment Yield in Baroro Watershed

    Garry M. Oca, University Research Associate, IRNR, CFNR, UPLB

19. Assessing the Impacts of Land Capability Zoning on Sediment Yield in Watersheds within Los Baños

    Diego Miguel C. Sapnu, University Research Associate, WILUP-UPLB

20. Assessment of Indicative Impacts of Land Use/Land Cover on Annual Water Yield Estimation (2015 and 2020) of Watersheds within Los Baños

    Diego Miguel C. Sapnu, University Research Associate, WILUP-UPLB

21. Reconnecting Ecosystem Connectivity: A Systematic Review of the Applications and Mechanism of Ridge-to-Reef Approach Across Different Geographic Locations

    Vida Q. Carandang, Associate Professor, IRNR, CFNR, UPLB

22. Assessment of Indicative Impacts of Land Use / Land Cover on Annual Water Yield Estimation (2015 and 2020) of Baroro Watershed

    Garry M. Oca, University Research Associate, IRNR, CFNR, UPLB

NETWORKING INITIATIVE

Dr. Glecy C. Atienza of the UP RI facilitated the Networking Initiative for INREM 2023 starting from Day 1. At the conference lobby, Dr. Atienza and her team provided a Networking Initiative Desk to gather inputs from the participants. On day 3, for the culmination of the activity, she provided an overview on networking or "pakikipag-ugnayan". She affirmed the importance of the "katiwala" concept in networking as this word translates to trust which is vital in networking initiatives. Afterwards, she asked the audience to examine the room and identify who among the other audience they have a network or linkage with. Likewise, they were asked to group themselves into the given general clusters for project pitches, viz: 1) financial mobilization; 2) policy implementation; 3) effective communication; 4) agency networking; and 5) changing mindsets. Each group provided inputs on its particular focus for possible future initiatives.

The first group on financial management sought to advocate for long-term and sustainable management in Southeast Asian tropical landscapes through bottom-up approaches, fostering co-designing and co-development frameworks with researchers, communities, universities, and government agencies within a five-year time frame. For the policy implementation group, their main target is solid waste management within the context of greenhouse gas emissions through policy review, ground validations, co-development of policy, and effective monitoring and evaluation.

On effective communication, the group aimed to implement an annual community engagement on the Ridge-to-Reef Approach and its role in food security with 1% allotment from IRA of LGUs through participatory methods and production of knowledge products with the end goal of changing dominant thinking and pilot testing in the communities.

Disaster Risk Reduction is the focus of the agency networking group. The goal can be achieved through leading initiatives to address DRR gaps in communities, partnerships among the public and private sectors and other stakeholders, hold meetings, workshops, and symposia to prevent duplication of efforts, and continuous monitoring and evaluation of initiatives being implemented to ensure progress.

Lastly, the group on changing mindsets – as the name suggests – aims to change the mindsets of communities towards innovation in advancing INREM through the multi-faceted approach of listening to, communicating to, co-development with, and educating communities towards increased awareness, building an atmosphere of commitment and trust – highlighting the cyclical approach of INREM's R2R approach.

Dr. Atienza emphasized that shared dreams among different groups may inspire and fire-up all the participants to give all their best, commit and contribute to whatever they can offer and be the agents in advancing those advocacies into reality.

CLOSING CEREMONY

Dr. Josefina T. Dizon, Professor Emeritus from the College of Public Affairs and Development of UPLB, presented the highlights of the second and third day of the conference - the plenary speakers, the 2 sets of parallel sessions, and the networking initiative.

This was followed by the awarding of winners for the Best Papers and Best Poster Competitions. Dr. Virginia C. Cuevas, Chairperson of the INREM 2023 Awards Committee, read the names and titles of the winning papers and posters, while the certificates and cash prizes were awarded by Vice Chancellor Roberto P. Cereno, UPLB-INREM Chair Dr. Juan M. Pulhin, and UPLB-INREM Co-Chair Dr. Michelle Grace V. Paraso.

The winning papers and posters were as follows:

3-minute Graduate Research Presentation:

First Place: *Pia C. Montoya*

Typhoon-induced Changes in Mangrove and its Impact on Livelihood Resources in Palawan, Philippines

Second Place: *Raisa Vera Tayaban*

An Assessment of Quezon City's In-City Socialized Housing Program in Creating Slum-Free Communities and Upgrading the Living Conditions of Informal Settler Families

Third Place: *Kyle Pierre R. Israel*

Forest Restoration Monitoring using Cloud-based Techniques Critical Watersheds in the Philippines

Undergraduate Research Presentation

First Place: *Louise Bernadette C. del Castillo*

Analyzing People's Organization Sustainability Indicators and Roles in Natural Resource Management: A Case Study of Ned Landcare Association, Lake Sebu, South Cotabato, Philippines

Second Place: *Toni Rose Villanueva*

Resiliency and Perception about Climate Change amid Multiple Hazards of Barangay Calangay, San Nicolas, Batangas, Philippines

Third Place: *Jennifer G. Bulil-lit*

Assessment of the Embryotoxic and Teratogenic Effects of Local Water Samples on the Craniofacial Cartilage Structures and Development of Zebrafish, *Danio rerio*

Poster Presentations

First Place: *Allen Glen Gil*

Post-Disaster Recovery Assessment of Mangrove Forests in Leyte Island, Philippines using Sentinel-2 Imagery

Second Place: *Leilani A. Castillo*

Threatened Plants in Selected Philippine Key Biodiversity Areas: A Preliminary Assessment

Third Place: *Jose Maria G. Boncan*

Defining the Cultural Ecosystem Services of Selected Manila Urban Green Spaces through a Landscape-based Co-assessment Framework

Best Session Papers

1. Landscapes and Seascapes

   Adrian Pablo V. Sasi

   Mangrove Extent Mapping using Different Mangrove Vegetation Indices and Sentinel-2 for Ecosystem Accounting in Occidental Mindoro, Philippines
2. Lakes and River Basins

   Kyle Vincent R. Singson

   Participatory Vulnerability Assessment and Qualitative Visualization of Impacts in a Multi-Hazard Scenario Towards Effective Adaptation and Resilience of Selected Barangays in the Quinali A Watershed in Albay

3. Rural-Urban Linkages

   Lorena L. Sabino, PhD

   Policy Implication of Drought's Cascading Effects on Sustainable Livelihoods and Natural Resource Management in South-Central Mindanao, Philippines

4. Small Islands

   Juan Carlos T. Gonzalez, DPhil

   Conservation Priorities for Small Island Ecosystems in the Philippines

In his closing remarks, UPLB Vice Chancellor Roberto P. Cereno expressed gratitude to the conference co-organizers, partners and participants. He shared his vision for a network of INREM stakeholders to be established and sustained as an offshoot of the conference. He hoped that the conference would lead to creative collaborations so that the participants can widen their reach, expand their influence and contribute to the betterment of society. He also excitedly shared the commitments of the leadership of Palawan State University and Western Philippines University to co-organize INREM 2025 in the beautiful island of Palawan, and the possibility of bringing INREM conferences abroad by forging a Memorandum of Understanding with the Asia-Pacific Network for Global Change Research.

PHOTOS OF DAY 3

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Landscapes and Seascapes	Dr. Edgar M. Reyes, Jr., Chair Dr. Pastor L. Malabrigo, Jr. Dr. Consorcia E. Reaño
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Dr. Maricel T. Villamayor	Associate Professor, College of Forestry and Natural Resources
Justine A. Marasigan	Teaching Associate, College of Forestry and Natural Resources

TECHNICAL AND ADMINISTRATIVE SUPPORT STAFF

Dr. Catherine S. Anders	University Researcher II, UPLB-INREM
Farah Y. Sevilla	Project Technical Specialist I, UPLB-INREM
Magnafin T. Galang	Project Technical Assistant II, UPLB-INREM
Kyle Vincent R. Singson	University Research Associate I, UPLB-INREM
Christian Ray C. Buendia	Project Technical Assistant V, UPLB-INREM
Pia C. Montoya	Project Technical Specialist I, UPLB-INREM
Angelica T. Magpantay	DOST-CIP Fellow, UPLB-INREM
Grace Ann S. Malolos	Project Technical Specialist I, UPLB-INREM
Dannica Rose G. Aquino	Project Technical Specialist I, UPLB-INREM
Karen M. Pajadan	Project Technical Specialist I, UPLB-INREM
Pauline Cielo P. Palma	Project Technical Assistant V, UPLB-INREM
Adrian Pablo V. Sasi	Project Technical Assistant V, UPLB-INREM
Laizha Lynn C. Lomente	Project Technical Assistant V, UPLB-INREM
Marielle R. Baliwag	Research Associate, UPLB-INREM
Sheerah Louise C. Tasico	Science Research Specialist I, UPLB-INREM
Joylyn Bon O. Yu	Science Research Specialist I, UPLB-INREM
Benrooz E. Fernandez	Project Assistant II, UPLB-INREM
Gershey Jayden B. Evangelista	Project Technical Assistant I, UPLB-INREM
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Jonathan David M. Maligalig	Junior Research Associate, UP RI
Mary Ann O. Cabansag	Senior Administrative Assistant II, UP RI
Hazel M. Victoriano	Administrative Officer IV, UP RI

Layout by:

CHRISTIAN RAY C. BUENDIA
Project Technical Assistant V

Prepared by:

KYLE VINCENT R. SINGSON
University Research Associate I

FARAH Y. SEVILLA
Project Technical Specialist I

Edited by:

ROSARIO V. TATLONGHARI, PhD
TWG Member, UPLB-INREM

Approved by:

JUAN M. PULHIN, PhD
Chair, UPLB-INREM