ICOPOD 2022

INTERNATIONAL CONFERENCE OF POST GRADUATE UNIVERSITY OF PAPUA 2022

BOOK OF ABSTRACTS

Thursday | Raja Ampat

November 24, 2022 | Zoom Meeting

IOP

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AGENDA

First Day, Date: November 24th, 2022

Time	Contents	PIC
09.00 – 09.05	Opening Ceremony	Master of Ceremony: Rina Jowei, Marlon
09.05 – 09.15	Welcome Speech **Dr. Hendri.** Chairman of the Conference **Abdul Faris Umlati, SE,** Regent of Raja Ampat Regency **Dr. Mecky Sagrim, SP, M.Si** Rector of Universitas Papua	
	Keynote Speech:	
09.15 – 09.30	Ministry of KLHK	Moderator: Prof. Wahyudi
09.30 – 09.45	Head of Badan Meteorologi Klimatologi dan Geofisika	
09.45 – 10.00	Head of National Board for Disaster Management	
10.00 – 10.05	Certificate submission	
	Expert Speech:	
10.05 – 10.20	**Prof. Hiroshi Ehara, Ph.D, Nagoya University** "*Sustainable Crop Production*"	Moderator: Dr. Irnanda
10.20 – 10.35	**Prof. Dr. Karl Kim, University of Hawaii** *"Disaster and SIDs"*	
10.35 – 10.50	**Prof. Dr. Sungsu Lee, Chungbuk National University** *"Community-based Approach"*	
10.50 – 11.00	Q & A	
11.00 – 11.05	Certificate submission	
11.05 – 11.20	**Mark Erdmann, Ph.D**, Germany "*Marine Biodiversity*"	Moderator: Dr. Saraswati Prabawardani
11.20 – 11.35	**Gregory Taff, Ph.D, WRI USA** "*Protecting People in Conservation and Climate Change Projects*"	
11.35 – 11.45	Q & A	
11.45 – 11.50	Certificate submission	
11.50 – 12.05	**Dr. Richard Sneider, IUCN** "*Nature Base Solutions; ecosystems as climate and biodiversity crops*"	Moderator: Dr. Keliopas Krey
12.05 – 12.20	**Prof. Charlie D. Heatubun, S.Hut., M.Si., FLS** *"Biodiversity"*	
12.20 – 12.30	Q & A	
12.30 – 12.35	Certificate submission	
12.35 – 13.00	Break	

13.00 – 15.30	Parallel Sessions, first speech by Invited Speakers. Moderated by: Dr. Elen Bless (A), Dr. Rawati (B), Gandi YS Purba (C), Marlon (D), Rina Jowei (E), Saraswati Prawardani (F), Prof Wahyudi (G)	
15.30 – 15.45	Closing Remarks –	
	Prof. Dr. Barahima Abbas. UNIPA "Genetic Diverstiy"	
15.45 – 16.00	**Dr. Mecky Sagrim, SP, M.Si** Rector of Universitas Papua	

Second Day, Date: November 25th, 2022 (Field Trip)

Table of Contents

ABSTRACT

Tumpak Sidabutar (National Research and Innovation Agency (BRIN)), Endang S. Srimariana (IPB University), Hendrik A.W. Cappenberg (National Research and Innovation Agency (BRIN)) and Sam Wouthuyzen (National Research and Innovation Agency (BRIN)).

Bloom driving factors of potentially harmful species of phytoplankton diatom in Jakarta Bay.

Abstract. The high abundance of phytoplankton has recently increased in Jakarta bay and frequently caused fish kills and environmental degradation. Most bloom events are due to the diatom species as organisms that often cause mass fish mortalities in Jakarta Bay. Most blooms of diatom often occur after the rainy season. The blooms in this bay seem connected with nutrient enrichment and climatic factors, especially rainfall or precipitation. The research was conducted to study the possible driving factors affecting the high abundance of the diatom. The diatom samples were collected using a 20 µm canonical plankton net, 125 cm in length and 30 cm in mouth diameter. The results showed the abundance of diatom ranged from 20.20 x106 cells.m-3 up to 20.61 x108 cells.m-3. There is a significant correlation between eutrophication and the high abundance of the diatom. Nitrogen and phosphor are critical in stimulating diatom growth with a higher N/P ratio. The observation results showed that phosphate concentration ranged from 0.23-2.40 µg/L (mean: 1.08 ug/L) and nitrate from 1.50-67.38 µg/L (mean: 4.80 ug/L), and silicate ranged from 1.75-151.83 µg/L (mean: 35,85 ug/L). The N/P ratio ranged from 0.79-46.53 (mean: 9.07), and the N/Si ratio ranged from 0.08-0.38. In general, nitrogen was a triggering factor, while phosphate was a limiting factor for phytoplankton growth. However, there is a tendency when the N/Si ratio > 1, the phytoplankton population tends to be dominated by dinoflagellate groups and vice versa; when the N/Si ratio < 1, the phytoplankton community tends to be dominated by the diatom group. The most common bloom makers are Skeletonema, Chaetoceros, and Thalassiosira, which primarily belong to diatom. They are frequently responsible for the incidents of fish killing during the blooms tragedy in Jakarta Bay.

Keywords: climate, diatom bloom, eutrophication, N/P ratio, harmful species

Yosephin Nugraheni (IPB University), Irdika Mansur (IPB University) and Erina Sulistiani (SEAMEO BIOTROP).

In vitro sterilization and callus induction from Cananga odorata forma genuina Steenis explants.

Abstract. Cananga odorata (ylang-ylang) is a plant with numerous uses, including ornamental use, traditional medicinal ingredient, as bio-pesticide, as perfume ingredient, clothing fragrance, and cosmetics. The high market demand for ylang-ylang essential oil needs to be supported by information on the in vitro process of callus formation to supports the secondary metabolites production without having to cut or harvest the trees so that biodiversity is maintained. The aims of this study were to analyze the explants sterilization method using sodium hypochlorite (NaOCl) solution that was most suitable for the initiation of ylang-ylang shoots and leaves, and to analyze the effect of BAP and NAA treatment on the formation of ylang-ylang callus. The design used is a completely randomized design. The methods used included the preparation of explants materials, sterilization with two treatments, and callus induction using a combination of BAP and NAA hormones with twelve treatment combinations. The results showed that sterilization of explants with sodium hypochlorite (NaOCl) solution at a concentration of 20% (v/v) for 10 minutes followed by a concentration of 15% (v/v) for 20 minutes was able to produce sterile explants in as much as 67.5% of cases. At the callus induction stage, the highest percentage of callus formation in leaf explants (33%) was in media-8 (BAP 0.5 ppm plus NAA 5 ppm) and media-9 (BAP 0.5 ppm plus NAA 10 ppm), while media-10 (BAP 1 ppm plus NAA 0 ppm) had the highest percentage of callus formation in shoot explants (by 40%).

Keywords: callogenesis, Cananga odorata, essential oil, secondary metabolite

Syuryawati Faesal (BRIN) and Paesal Paesal (BRIN).

Feasibility of Ratun System Sorghum Cultivation Technology for Sorghum Development.

Abstract. Cultivation sorghum of the ratoon system as a technological improvement is a practical finding, can reduce production costs, be efficient in labor and time, and increase income because more than one harvest. In this regard, a study was conducted to determine economic feasibility of ratoon system cultivation technology in supporting development of sorghum. Research was conducted at Bajeng Experimental Installation, Gowa Regency, South Sulawesi in March-October 2019. Sorghum planted on marginal land were arranged by split-split plot design with 3 replications. The treatments evaluated consisted of main plant and ratoon sorghum against five superior sorghum lines, plant population, and use of sorghum stover mulch. The results showed that five lines of sorghum were tested, yielding sorghum once the main crop was 5.98-6.45 t ha-1, income was Rp. 11.96-12.90 million ha-1 and profit was Rp. 4.00-4.86 million, R/C 1.50-1.60. With two harvests (main crop and ratoon) yield is 11.01-11.70 t ha-1 and a profit of Rp. 10.99-12.25 million ha-1, R/C 2.00-2.10, MBCR 2.27-2.38. There was an increase in profit obtained from ratoon of 7.39 million. In plant population, by increasing population from 66,666 to 133,330 plants ha-1 in ratoon; yield increased by 11.59 t ha-1 from 10.86 t ha-1, profit increased by 12.05% from 10.77 million to 12.07 million ha-1. Use of sorghum stover mulch, profits obtained were greater or increased by 3.53% than those did not use mulch, R/C was 4.68 and cost per kg of seeds was low of Rp. 427. Provide higher sorghum yields and higher income, so this technology is feasible to be applied for sorghum development.

Keywords: feasibility, ratoon cultivation, income, sorghum
Topics: Biodiversity

R. Vitri Garvita (National Research and Innovation Agency Republic of Indonesia (BRIN)), Lily Ismaini (National Research and Innovation Agency Republic of Indonesia (BRIN)), Frisca Damayanti (National Research and Innovation Agency Republic of Indonesia (BRIN)), Intani Quarta Lailaty (National Research and Innovation Agency Republic of Indonesia (BRIN)), M. Imam Surya (National Research and Innovation Agency Republic of Indonesia (BRIN)), Harto (National Research and Innovation Agency Republic of Indonesia (BRIN)) and Nudin (National Research and Innovation Agency Republic of Indonesia (BRIN)).

A study on seed germination of Senna alata (L.) (Ketepeng).

Abstract. Senna alata (L.) Roxb., locally known as “ketepeng china” from the family of Fabaceae is a shrub or small tree that is used as an ornamental flowering shrub and for medicinal purposes in tropical and subtropical countries. Various parts of S. alata plant (leaves, flowers, roots or the stem) are used in traditional medicines to treats of typhoid, diabetes, malaria, asthma, ringworms, scabies, and eczema. The present study was design to investigate for conserve this plant by establishing an efficient seed germination method. The seeds of S. alata responded differently to each location and medium. The best result produced seedlings are grown in pots filled with sand, both at Bogor and Cibodas. The percentage of seed germination for 10 days was higher on sand which was around 96.7% than husk media about 0.1%.

Zuyasna (Syiah Kuala University), Nanda Mayani (Syiah Kuala University), Dara Maulina (Syiah Kuala University) and Farida Iriani (Cendekia Mandiri University*).*

Using NPK fertilizer on several soybean mutant in sub-optimal land.

Abstract. Soybean is one of the important food crops in Indonesia. Most soybean needs in Indonesia are still imported, because domestic production is still low. The low soybean production in Indonesia is partly due to the lack of availability of superior varieties that are able to adapt to the environment and the application of cultivation technology that has not been optimal by farmers. This study aims to obtain the best dose and strain of the mutant Kipas Merah and the best combination in a sub-optimal environment. This study used a 3 x 7 factorial randomized block design with 3 replications. The dose of NPK fertilizer is the first factor consisting of 3 levels, (200 kg ha-1, 300 kg ha-1, and 400 kg ha-1). While the second factor is the mutant line of Kipas Merah (A1, A2, A7, A11, and A14). In addition, as the comparison using Kipas Merah (parent) and Deja2 variety. The results showed that the treatment dose of Phonska NPK fertilizer (15:15:15) was better found in the application of a fertilizer dose of 400 kg ha-1 on the number of productive branches, the number of pods per plant, the number of seeds per plant, the weight of seeds per plant, the weight of 100 grains, the weight of seeds per plot and the potential yield. The best mutant lines among the tested lines were the A1 and A11 mutant lines. The best A1 line was on the parameters of the number of branches, the number of productive branches, the number of seeds per plant, and the weight of seeds per plant, while A11 was best on parameters of seed weight per plant, the weight of 100 grains, the weight of seeds per plot and the yield potential.

Keywords: NPK dose, mutant line, gamma irradiation

Paesal Pate (BRIN), Muhammad Azrai (Kementan), Muhammad Jayadi (Unhas), Yunus Musa (Unhas), Roy Efendi (BRIN) and Syuryawati Faesal (BRIN).

Screening of Acid Tolerant Hybrid Maize Lines and Parents Using Modified Acid Mineral Soil.

Abstract. Absract

Screening of hybrid corn parent lines quickly and cheaply compared to hydroponic methods in the laboratory is needed to support the assembly of new high yielding varieties of acid tolerant maize. Screening can be done by planting corn seeds using acid soil modified to a target pH of 6.5 (normal) and pH 4.3 (acidic). The addition of CaCO2 and AlCl3 was equivalent to 2 t/ha CaCO3 (normal) and 0.5 t/ha AlCl3 (acidic). A total of 12 elite maize lines were tested based on relative root growth (RRG). Two sets of experiments were made, namely normal soil media (pH 6.5) and acid soil media (pH 4.3). The experimental design used in each experimental set was a randomized block with three replications. Observations were made including: root length, plant height, leaf length, leaf width, plant fresh weight, plant dry weight, root fresh weight, and root dry weight. The results showed that rapid screening of hybrid corn parental lines could be carried out by using modified soil acidity method by adding CaCO3 and AlCl3 to acid soil by measuring relative root growth (RRG) as the main parameter. The obtained maize lines 1, 3, 4 and 11 were classified as tolerant, while lines 2, 4 and 8 were classified as medium tolerant, while lines 6, 7, 9, 10 were sensitive. The screening method for hybrid corn parent lines on acid soil modified to pH 4.3 (acidic) and normal soil pH 6.5 at seedling age 7 days after planting (d.a.p) was more accurate than at the age of corn seedlings14 d.a.p.

Keywords: 1. Screening, 2. Maize, 3. Hybrid Lines, 4. Acid Soil

Nurhaidah Iriany Sinaga (Forestry Department, Papua University, Manokwari), Jimmy Frans Wanma (Forestry Department, Papua University, Manokwari), Nithanel M Hendrik Benu (Balai Penelitian Hutan Papua dan Maluku), Tumpal Sinaga (Environmental Department PT. Freeport Indonesia), Yan Douw (Environmental Department PT. Freeport Indonesia) and Robert Sarwom (Environmental Department PT. Freeport Indonesia*).*

After 25 Years of Reclamation Project, Fabaceae Family in Forest Succession of The Tailing Area PT. Freeport Indonesia.

Abstract. Since 1995, PT Freeport Indonesia has been building forest succession in its tailing area. The first vascular plants were ferns. The spermatophyte species, especially grass, were coming later. In 2005, grassland covered all permanent plots, except a few small trees from pioneer species. The Family Fabaceae was one of the plant groups found in the area, with 12 species. Over 15 years later, the grassland area has vanished, replaced by secondary forest. The composition of plants is changing, including the Fabaceae family. In 2021, researchers will investigate what the species is and how it contributed to the succession. The method of the study is a descriptive method with both survey and analysis vegetation techniques using plot samples. About 25 plots were put in every location, including seedling, sapling, pole, and tree plots. The location was about 12 areas in the natural succession forest of the tailing area. The results show that about 25 genera and 40 species under the Fabaceae family occur in the area. The Fabaceae family is a unique species that brings fertilization conditions to plants. In succession forest, fertilization is one of the conditions for building a forest. The bigger tree in the area belongs to Falcataria moluccana, one of the Fabaceae species. It reaches 90 cm in diameter on location 11. In 2005, the species did not appear. It is meant that the diameter may increase by 5 to 6 cm every year.

Keywords: Fabaceae Family, Succession Forest, Tailing area Freeport Indonesia

Endang Setiani (Faculty of Forestry Papua University), Abdul Azis (Faculty of Forestry Papua University), Cicilia Maria Erna Susanti (Faculty of Forestry Papua University), Susilo Budi Husodo (Faculty of Forestry Papua University) and Yuyu Rahayu (Faculty of Forestry Papua University).

Phytochemical Analysis Katuk Hutan Leaf (Phyllanthus Reticulus var Reticulatus) with Two Drying Methods.

Abstract. Katuk hutan (Phyllanthus reticulatus var reticulatus) is one of the plants grow in Papua. Katuk hutan is widely used by the community as a traditional medicinal ingredient and started to be used economically (traded) in a small scale home industry. One of the processes to be considered in the utilization of this plant is the drying process. The purpose of the study was to determine the chemical components (phytochemicals) in katuk hutan leaves using two drying methods, electric oven and solar oven. Katuk hutan leaves were harvested from the Insifuri Village area, Amban, Manokwari. Leaves are divided into young leaves, half-mature leaves and mature leaves. The electric oven drying uses a temperature of 50oC and for solar oven depends on the intensity of available sunlight on daily bases. The study showed that katuk hutan leaves contain flavonoid and saponin components. Unexpectedly, the drying methods used do not affect the chemical content in the material, since it is known that the drying methods are important variables in determining the accuracy of the plant chemical composition. The study also found that the three level of leaves maturity showed no significant difference in the chemical components.

Keywords: katuk hutan leaves, Phyllanthus reticulatus var reticulatus, phytochemical analysis

Antoni Ungirwalu (Universitas Papua), San Afri Awang (Faculty of Forestry, Gadjah Mada University), Ahmad Maryudi (Faculty of Forestry, Gadjah Mada University), Priyono Suryanto (Faculty of Forestry, Gadjah Mada University), Jonni Marwa (Universitas Papua) and Charile Heatubun (Badan Riset Daerah Provinsi Papua Barat).

An Adaptive Social Forestry Model in West Papua Based on Cultural Forests and the Leading Potential of NTFPs: Theory and Practice.

Abstract. The concept of adaptive forest resource management is needed as a theoretical basis for the interests of realizing the pattern of development of local communities, especially in West Papua in accordance with the unique ecological environment of the forest and its culture. The purpose of this study is to develop adaptive natural resource management scenarios based on the concept of forest-culture based on the potential of NTFPs, namely Papua Nutmeg and Black Fruit that are utilized by local communities in West Papua. The results of the study show that the scenario of adaptive natural resource management based on the typology of specific management units in natural forests (NF), secondary forests (SF) and home-gardens (HG) is an inseparable systemic-holistic unit. The comparison of the qou status of utilization and preservation of black fruit superior products is currently in the category of Pessimistic-Moderate management. While for the utilization and preservation of papua nutmeg shows the best management category (Optimistic). Of the three typologies, the utilization of papua nutmeg in the secondary forest landscape has the highest index value of 81.7%. Meanwhile, for the typology of landscaping in the natural forest and secondary forest habitat groups, it is in the moderate category (76.7% and 42.8%). The best category of adaptive management of black fruit for the moderate category is secondary forest landscaping (63.9%), followed by natural forests (58.9%). The home garden habitat has a pessimistic category (29.4%), the biggest weakness is contributed by economic and institutional levers that have not been managed optimally. It is hoped that this concept can be applied to the axiology of forestry policies, especially in developing local community-based forest management programs and can be used as a reference for norms, standards, procedures and criteria (NSPC) that will be used to determine forest management schemes in West Papua.

Keywords: Adaptive management, forest-cultural, NTFPs, West Papua

Vera Sabariah (University of Papua), Fanny F C Simatauw (University of Papua), Mudjirahayu (University of Papua), Yori Turutoja (University of Papua), Nurhani Widiastuti (University of Papua), Fitriyah I E Saleh (University of Papua), Paska I Salmanto (University of Papua), Ismawati (University of Papua) and Aldrovando Y Sorentou (University of Papua).

PARASITIC INFECTION AS SEASONAL AND ENVIRONMENTAL BIOMARKER OF PELAGIC FISH.

Abstract. Pelagic fish such as yellowfin tuna (Thunnus albacares), mackerel tuna (Euthynnus affinis) and Indian mackerel (Rastreligger sp.) are widely distributed and known as highly migratory species. The objectives of this study were to examine parasites on the pelagic fish landed on Fish Market in Manokwari, and to determine which parasites could be the biomarker migration of the fish. Study was done on February to April 2021 and May-September 2022. Results showed that prevalence of Anisakis sp. on mackerel tuna (Euthynnus affinis) was 36% categorized as common, that was higher than parasite Lecithochirum sp. (8%) and Camallannus sp (4%). Yellowfin tuna (Thunnus albacares) was infected 95% by Didymozoid sp. and categorized as always, on the other hand, Indian mackerel (Rastreligger sp.) was infected by Anisakis sp. (10%) categorized as often. Nematode Anisakis sp. could be defined as biomarker parasites for small pelagic fish, while Trematode Didymozoid sp. was for big pelagic fish that migrated around Northern waters of Papua.

Keywords: parasite, pelagic fish, Anisakis sp, Didymozoid sp, Papua

Baharuddin Patandjengi (Department of Plant Pests and Diseases, Faculty of Agriculture, Hasanuddin University, Makassar, South Sulawesi, 90245), Tutik Kuswinanti (Department of Plant Pests and Diseases, Faculty of Agriculture, Hasanuddin University, Makassar, South Sulawesi, 90245), Melina Melina (Department of Plant Pests and Diseases, Faculty of Agriculture, Hasanuddin University, Makassar, South Sulawesi, 90245), Asman Asman (Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Hasanuddin, Makassar), Mustika Tuwo (Department of Biology, Faculty of Mathematics and Natural Sciences, Hasanuddin University) and Muhammad Farham (Department of Plant Pests and Diseases, Faculty of Agriculture, Hasanuddin University, Makassar, South Sulawesi, 90245).

Detection of Citrus Vein Phloem Degeneration Disease (Cand. Liberobacter asiaticum) in Selayar Tangerines Citrus reticulata L.

Abstract. CVPD disease is caused by the bacterium Cand. Liberobacter asiaticum which belongs to the subdivision of Proteobacteria. This bacterium lives in the phloem tissue of citrus plants. The molecular detection technique that can be used for the diagnosis of this disease is PCR (Polymerase Chain Reaction). The study aimed to detect the presence of CVPD disease early in nurseries, rootstock sources, and citrus plantations as well as the percentage of attacks in the Selayar Islands Regency. This research was carried out in the Districts of Bontomanai and Bontoharu and the PCR test was carried out at the Laboratory of Biotechnology and Tree Breeding, Faculty of Forestry, Hasanauddin University. Observations were made visually on citrus plants that showed typical symptoms, namely, there were symptoms of chlorosis between the leaf bones while the leaf bones were still green, especially in the leaf shoots. The percentage of plants affected by CVPD is the number of plants showing symptoms of chlorosis divided by the number of plants observed and multiplied by 100%. The results showed that the percentage of plants with CVPD-like symptoms in Bontonasaluk Village, Bontomatene District for the Selayar variety was 21%, Selayar – Selayar (S-S) was 13%, and JC – Selayar (JC – S) was 10%. The percentage of citrus seedlings with CVPD-like symptoms in 2 nurseries were 0.27% and 0.09%. The PCR technique was not successful in amplifying DNA fragments of Cand bacteria. Liberobacter asiaticum measuring 1160 bp and also no vector from CVPD (Diaphorina citri) at the rootstock source location or in nurseries during field observations.

Keywords: CVPD, PCR, Orange, Vector

Budiaman B (Faculty of Forestry, Hasanuddin University, Makassar), Sitti Nuraeni (Faculty of Forestry, Hasanuddin University, Makassar) and Ramli R (Faculty of Forestry, Hasanuddin University, Makassar).

Insect Diversity in Bitti Stands (Vitex cofassus).

Abstract. Insects are the most abundant animal group compared to other animal groups, this is related to the high adaptability of insects to various types of habitats. This study aimed to analyze the diversity of ground and arboreal insects (nocturnal and diurnal) in bitti stands (Vitex cofassus) in Belabori Village, Parangloe District, Gowa Regency. Data collection was carried out for 2 months using 3 trap techniques (Sweep Net, Pitfall Trap, Light Trap). The results showed that each of the captured insects consisted of 8 orders, 19 families, 28 species and a total of 231 individuals which were divided into 45 ground insects, 163 nocturnal insects and 21 diurnal insects. The order most often found in insects on the ground is the order Hymenoptera, while the arboreal insects (nocturnal and diurnal) are the order Coleoptera. The Shanon-Wieiner diversity index category (H') in bitti stands on ground surface insects and arboreal insects (nocturnal and diurnal) was classified as medium category and the Margalef species richness index (Dmg) was classified as low category.

Keywords: Diversity, Insects, Bitti Stand

Bagus Primohadi Syahputra (Meteorology Department, School of Meteorology Climatology and Geophysics), Andi Afi (Agrotechnology Department, Faculty of Agriculture, University of Riau) and Maria Imaculata Tiara (Jayapura Climatological Station, Indonesian Agency for Meteorology Climatology and Geophysics).

Evaluation of Optimum Conditions of Agricultural Commodity Growth in Papua against Changes in Climate Parameters.

Abstract. Climate change has had a direct impact on the agricultural sector in several regions of the world, so it is necessary to evaluate the condition in Papua as a province that has begun to develop the agricultural sector. The purpose of this study was to assess and evaluate the suitability of agricultural areas in Papua to changes in climate parameters. The data used are BMKG synoptic observation data and JMA & NASA reanalysis model data for the monthly period from 1980 - 2020 with a 20-year baseline. The method used is spatial and point statistical analysis with Gaussian probability. The parameters used in the form of surface temperature, relative humidity and rainfall were evaluated against the threshold for the growth of the main agricultural crops in Yahukimo, Merauke, Supiori, and Paniai. The results obtained, in the temperature data there is a significant shift in temperature increase and the highest probabilistic percentage increase is 12.44% in Yahukimo. In the rainfall data, in general there is a shift in the increase in the accumulation of monthly rainfall but there is a decrease in the probabilistic percentage, the lowest is 13.86% in Supiori. In the air humidity data, in general there is a shift in the average increase as well as an increase in the probabilistic percentage up to 12.49%, the highest in Yahukimo. This change causes the most affected commodities that need attention are Rice, Sweet Potatoes, Corn, Peanuts and Cassava. Spatially, the shift pattern of positive data is more concentrated in the central part of Papua for temperature and humidity parameters, but for rainfall the greatest change in concentration occurs on the north coast of Papua. This result is expected to be a consideration for farmers in adjusting the pattern of agricultural management in the study area.

Keywords: Climate Change, Gaussian Distribution, Papua Agriculture.

Sartji Taberima (Department of Soil Science, Faculty of Agricultural, Papua University), Ovi Putri Irawati (Alumni of the Agricultural Cultivation Department, PS Agrotechnology, Faculty of Agricultural, Papua University), Nouke L. Mawikere (Study Program of Agricultural Magister, Post Graduate, Papua University) and Obadja A. Fenetiruma (Agribusinesses Department, Faculty of Agricultural, Papua University).

THE LOW LAND AREA FOR SUSTAINABLE CONSERVATION OF HORTICULTURAL PLANTS IN BINTUNI BAY REGENCY.

Abstract. Proper cultivation technology and improvement in product quality can be made to improve the production and quality of horticulture plants. In addition, environmental factors also affect the production of horticulture plants. One of these factors is soil or land. This study aims to determine the land suitability class of superior commodity of fruit and vegetable horticultural plants, which has the potential to be developed in the lowland of Bintuni Bay. The research was located in the Lowland area of the Bintuni Bay Regency, which includes Bintuni, Manimeri, Meyado, and Beimes. Sampling data was collected from November 2017 to April 2018. The results showed that Manimeri has the potential to be developed with fruit horticultural such as oranges, pineapples, durians, mangoes, and vegetables such as chicory, cucumber, cabbage, and tomatoes. Based on actual land suitability, it was categorized as marginal land with limiting factors for water availability, nutrient retention, and nutrient availability. Bintuni can be developed with fruit crops (durian, mango, avocado, oranges) and vegetables (chicory, long beans, and red chilies). Based on the actual land suitability class, it was categorized as quite a suitable and marginal land with limiting factors, i.e. water availability and nutrient availability. Meyado has the potential to be developed with horticultural crops (Chinese cabbage, long beans, cucumber, and eggplant). Based on actual land suitability, it was categorized as marginal land, with limiting factors for water availability and nutrient retention. Beimes has the potential to be developed with fruit crops (pineapple and papaya), with the land suitability class being quite suitable, while for fruit crops such as mango and durian, as well as green beans, chicory, tomatoes, and red chilies, less suitable to be developed on this land, because it includes marginal land with the limiting factors being root media, water availability, and low nutrients.

Keywords: Bintuni-Bay Regency, Land Suitability, Horticultural Plants

Aditya Rahmadaniarti (Faculty of Forestry, University of Papua), Matheus Beljai (Faculty of Forestry, University of Papua), Mutakim Mutakim (Faculty of Forestry, University of Papua) and Nurfaida Fuji Lestari (Faculty of Forestry, University of Papua).

Planting Pattern and Space Utilization of Homegarden Based Ethnicity: Case Study in Waraitama Village, Manimeri District, Teluk Bintuni Regency.

Abstract. The home garden is located around the house area with clear ownership boundaries, usually used as a place to raise livestock, plant flowers, vegetables, or other crops, and also as a place for the activities of the owner of the yard. The ethnic diversity that exists in Teluk Bintuni Regency, especially in the Waraitama village will cause the characteristics of the home garden that be managed for different purposes. This study aims to determine the pattern arrangement of vegetation and space utilization in the home garden. This research was conducted in the home gardens of Waraitama Village, Manimeri District, Teluk Bintuni Regency. The data collection method was carried out by purposive sampling on 38 yards overgrown with woody plants. Data was taken by the census, i.e. all woody plants with a diameter of more than 10 cm that grow in the yard. The data were taken in the form of cropping patterns and the composition of plants that make up the home garden. Data analysis includes the Important Value Index (INP), Diversity Index (H'), and SEXiFS visualization. The results showed that the cropping pattern that developed in the home gardens of the ethnic Papuan, Bugis, Toraja, and Javanese communities was a random mixture. Ethnic Papuans have a higher INP and diversity index (H') than the other three ethnic groups, with values of 25% and 0.191, respectively. The diversity index value (H') 0.191 indicates that the variety of species in the ethnic Papuan home garden is low. The use of space in the home gardens of the four ethnic groups is not good because there are still quite a lot of home gardens that are overgrown in groups and in other parts there is still space.

Keywords: home garden, planting pattern, space utilization

Gemasakti Adzan (World Resources Institute (WRI) Indonesia), Dewi Ratna Sari (World Resources Institute (WRI) Indonesia), Nirarta Samadhi (World Resources Institute (WRI) Indonesia) and Tomi Haryadi (World Resources Institute (WRI) Indonesia).

Tanah Papua Deforestation Risk Model: Understanding the Deforestation Drivers and the Implication of New Provincial Area.

Abstract. Tanah Papua extend across 41.2 Mha of landmass which is divided into two provinces Papua (31.4 Mha) and West Papua (9.8 Mha). Papua and West Papua are Indonesia's last forest frontier, which hold about one-third of Indonesia's remaining rainforests covered by 83.6% (34.6 MHa) natural forest store more than 16 giga tons CO2 carbon sink. Protecting Tanah Papua forest would significantly help Indonesia to achieve NDC, as such two governors of Tanah Papua was signed a declaration to protect 70% of forest cover under conservation area. Yet, deforestation is inevitable as consequence of development in Tanah Papua. This study is aiming to create deforestation risk model based on the main drivers of deforestation and develop future projection of deforestation for establishment of four new provinces in including Papua Selatan, Papua Tengah, Papua Pegunungan, and Papua Barat Daya. Deforestation risk are projected by comparing the implementation of two scenarios: existing provincial spatial plan (RTRW) and establishment of new provinces. Deforestation risk model are developed by generating historical forest cover loss data from Global Forest Watch and spatial explanatory variables representing topography, disturbance, and land use aspect. The preliminary results show that road infrastructure (31%), selective logging (22%), and industrial plantation (14.7%) became the biggest three main drivers of deforestation in Tanah Papua. Initial deforestation model shows that Papua Selatan and Papua are prone to future deforestation compared to other new provinces with natural timber extraction and industrial plantation as the main drivers. Realizing from provincial expansion in Sumatra and Kalimantan, it is known that establishment of new provinces will always increase the deforestation risks. Thus, this study also develops indicative spatial plan for new provinces to lowered deforestation risks, as such establishment of new provinces would not provide significant impact of forest cover loss in Tanah Papua.

Keywords: Tanah Papua, Deforestation, New Provinces, Spatial Plan

Yakobus Harewan (Environmental Science Departement, University of Papua, Indonesia) and Rully Novie Wurarah (Developmental Economics Departement, University of Papua, Indonesia.).

Analysis of Land Conservation To Economic Growth: The Case Of Other Purpose Areas.

Abstract. Other Purpose Areas (OPA) are forested areas or part of the forested area within the area authorized by the central government to the district government. The management of the OPA, given its role in maintaining vital functions, could benefit the community and even support ecosystem conservation. The development of economic activity has encouraged an increase in land use regulations and pressures as a result of land use changes. This condition influences the ecosystem. This study uses a dynamic system model to analyze systemic models and changes in land conversion as a result of the diverse economic and social activities of the community that continue to develop. Changes in land use in other use areas for infrastructure needs, socio-economic interests, and residential areas impact the environment's carrying capacity during the year. Simulations up to 2040 show that OPA is still available for business development activities. There is an encroachment of primary forest areas due to the economic needs of the community in the agricultural sector. However, by developing the industry sector and encouraging economic growth, the conversion of primary forest lands has declined by about 15 percent.

Keywords: forest area, investment, converted land, environment, Indonesia

Pande Komang Suparyana (University of Mataram), I Putu Eka Indrawan (University of PGRI Mahadewa Indonesia), Ni Nyoman Parmithi (University of PGRI Mahadewa Indonesia) and Ni Luh Putu Yesy Anggreni (University of PGRI Mahadewa Indonesia).

Factors that influence the entrepreneurship of women farming in doing a livestock post African Swine Flu virus in mengwi village.

Abstract. The Livestock Group of Sari Maju is located in Mengwi Village, which is engaged in the cultivation of pigs and is a partner in the Community Partnership Program. The impact of the African Swine Flu virus was also felt by the Livestock Group of Sari Maju, with this virus causing many of the group's domesticated pigs to die, as well as the decline in the price of pigs because all breeders tried to sell their livestock to reduce the risk of death of pigs. Coupled with the effect of activity restrictions during the Covid-19 pandemic, the supply of animal feed was hampered and made feed prices rise. So that many farmers cannot survive and cause farmers to suffer losses. As many as 75% of farm animals died by the virus in the Livestock group of Sari Maju. The purpose of this service activity is to find out what factors are the motivation for the Livestock Group of Sari Maju to conduct livestock business after the swine flu virus. The partners of this activity consist of 15 members of the Livestock group of Sari Maju. The internal data were analyzed by descriptive method. The data obtained are distributed into different classes or categories so that a frequency distribution with a Likert scale will be obtained. The results of the activity showed that the dominant attitude affecting the entrepreneurial spirit of the Livestock Group of Sari Maju was the attitude of daring to take risks, which was 90%. The confidence value is the lowest at 79%, where the Livestock Group of Sari Maju is expected to increase confidence in doing livestock business. The entrepreneurial spirit through the characteristics that exist in the livestock group is required to be even more enthusiastic in working, taking the initiative to increase creativity and achievement.

Keywords: Entrepreneurial Spirit, Group of Woman, Pig Livestock

I Putu Sugiana (Bali Research Center), Elok Faiqoh (Universitas Udayana) and I Wayan Eka Dharmawan (badan riset dan inovasi nasional).

Spatial Distribution of Carbon dioxide (CO2) and Nitrous oxide (N2O) Concentration Across Three Mangrove Zone in Benoa Bay, Bali.

Abstract. Behind their role as carbon sinks, mangrove soil can also emit greenhouse gases (GHG) through microbial metabolism, reducing their carbon mitigation potential. However, their emission was scarce in every mangrove zone. We measured the CO2 and N2O concentrations in Benoa Bay, Bali, which experienced anthropogenic pressure, including nutrient pollution and urban reclamation. Rhizophora mucronata and Sonneratia alba dominated the mangrove vegetation in this Bay and have a characteristic zonation across the intertidal (landwards, middle, and seaward zone). Gas samples were taken using a 10ml syringe above a height of 25 cm from mangrove soil during the wet season of 2020 at the three mangrove zones within three sites. Gas concentrations ranged from 303.09 – 330.57 ppm for CO2 and 0.51 – 0.53 ppm for N2O. CO2 and N2O concentrations were similar across mangrove zones, with a decreasing trend from the land toward the sea. A high density of mangrove trees was negatively associated with CO2; meanwhile, no soil and porewater parameters were significantly correlated with the gas concentrations. The result revealed that N2O concentration had exceeded the average value of the earth's atmospheric N2O concentration. Therefore, these data suggest that anthropogenic pressure could significantly influence mangrove soil to produce more GHG, especially for N2O. This information is essential for complementing previous research variations on greenhouse gas emissions and helps support the inventory of GHG emissions from the forestry sector in preparing blue carbon emission profiles in the FoLU (Forestry and Other Land Use) Net Sink 2030 program.

Keywords: greenhouse gases, FoLU Net Sink 2030 program, intertidal, anthropogenic pressure

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Natural Dyes used by the Byak Tribe and Its Prospects as Raw Materials for the Natural Dyes Industry.

Abstract. Dyes have been widely used by the communities for various purposes, such as a compositional ingredient in food, customs or traditional activities and crafts. The types and methods of usage are highly dependent on the presence of plants and animals found around residential areas and there are also several exotic species which are assimilated come from other ethnic groups. The aim of this study are to determine the types of plants that produce natural dyes used by the Byak community in Biak Numfor Regency as handycraft dyes and the prospects for cultivating these plants as a source of raw materials for the natural dye industry. The research showed that the Byak ethnic community used eight species of plants as dye materials for handycraft products such as Asytasia gangetica (L)., Melastoma maladatthricum (L), Arcangelisia flava (L) Merr, Morinda citrifolia (L), Philantus sp., Macaranga tessellate var glabrescens, Mallotus floribundus (Blume) Mull.Arg., and Bruguiera gymnorrhiza (L) Lank. From all the species Asystasia sp. is easier to cultivate using stem cuttings and relatively fast growing.

Keywords: natural dyes, Byak ethnic, handycraft dye

Ainun Mardiyah Yasir (Universitas Hasanuddin), Tutik Kuswinanti (Universitas Hasanuddin) and Andi Nasruddin (Universitas Hasanuddin).

The Evaluation Effect of Stenocarpella maydis on Seed Quality in New High-Yielding Maize Vareties.

Abstract. Stenocarpella maydis can cause a decrease in the yield and quality of corn due to the mycotoxins produced. The aim of the study is to determine the association and resistance growth response of 10 maize varieties infected with S. maydis. The effect of S.maydis on the quality of 10 seeds of superior maize varieties. The seeds were sterilized using a 5.15% NaClO solution and sterile water. Seeds were stored on a PDA containing isolate S. maydis and without isolate for 72 hours, grown on straw paper and polybags. Observations on germination, plant growth, incidence and severity of disease. The Koch Postulate method was carried out by taking symptomatic plant tissue and then isolated and purified, then observed macroscopically and microscopically at the Laboratory of Pest and Plant Disease Sciences, Hasanuddin University. The results showed that S.maydis caused the germination of maize seeds in the Pertiwi and NK sumo varieties to only 33.3%, while the highest germination occurred in the Sukmaraga variety at 91.7%. The growth of corn plants showed differences in height and number of leaves in each of the 10 varieties. As much as 100% incidence of base rot disease in seeds that have been inoculated with S. maydis. Severity of the disease in the vegetative phase occurred in the motherland variety by 67% and NK Sumo 62%. The varieties with the lowest severity occurred in the Sukmaraga and Zakarin varieties by 38%. These data indicate that the germination of seeds is very influential on increasing the incidence and severity of disease. Selection of varieties that are resistant to the pathogen S. maydis is highly influential because infected corn seeds can be a source of inoculum that can cause corn seeds to be susceptible to S. maydis.

Keywords: Stenocarpella maydis, germination, corn varieties
Topics:

Derek Ampnir (Universitas Papua), Budi Santoso (Universitas Papua), Rudi A Maturbongs (Universitas) and Hendri H (Universitas Papua).

Local Food Resilience in an Effort to Anticipate Extreme Climate in Small Islands of West Papua.

Abstract. Food security and community resilience in small islands that are very vulnerable to extreme climatic conditions that cross the northern coast of West Papua which are directly opposite the Pacific Ocean with intense tropical storms with the impact of heavy rains, strong winds, and high currents over a period of time, 1-2 weeks. Therefore, an effort to find out what local food types are used by the community in the effort of food resilience and security in times of extreme climate in the small islands of West Papua. The benefit index (BI) will be used to identify local food resilience with survey and field observation using purposive sampling interviews with the local community in small islands. Results of the study showed the highest BI value of carbohydrate-rich crops were sukun (Artocarpus altilis) which accounted 98%, followed by banana (Musa sp.) 94%, and sweet potato (Ipomea batatas) 90%, taro (Colocasia esculenta) 89%, and cassava (Manihot esculenta) 87%. Vegetable crops with the highest BI value were gedi leaves (Abelmoschus Manihot) 90% and papaya leaves (Carica papaya) 85%, followed by sweet potato leaves (Ipomea batatas) 55%, cassava leaves (Manihot esculenta) 50% and pumpkin leaves (Cucurbita sp.) 45%. The highest BI values in fruit crops are mango (Mangifera indica) 70%, papaya (Carica papaya) 70%, durian (Durio zibethinus) 60%, and soursop (Annona muricata) 50%.

Keywords: Food security, community resilience, small islands, BI, carbohydrate, vegetable, fruit
Topics:

Nurul Fauziah (Universitas Hasanuddin), Baharuddin Patandjengi (Universitas Hasanuddin) and Tutik Kuswinanti (Universitas Hasanuddin).

Epidemiological Study of Root Rot Disease (Phytophthora sp.) and the Resistance Level of Local Pamelo Citrus Clones (Citrus maxima) in Pangkep Regency.

Abstract. Pangkep pamelo orange has advantages compared to other pamelo oranges, specific taste, sweet and juicy, pink flesh, medium flesh texture, soft aroma and almost seedless. The purpose of this study was to determine the relationship between the intensity of stem rot disease intensity and environmental factors in several pamelo citrus clones in Ma'rang, Segeri, and Labakkang Districts, Pangkep Regency. The disease-causing pathogen was isolated from the symptomatic tissue plant, then observed microscopically at the Laboratory of Pest and Plant Diseases, Hasanuddin University. The results showed that the highest stem rot disease intensity was in Ma'rang District with a percentage of 82%, in red and white pamelo clones at 36% and 30%, respectively. Followed by Labakkang District with a percentage of 52% and clones of red pamelo and golla-golla by 26% and 20% and the lowest intensity in Segeri District by 44% in red, white and golla-golla clones of 18%, 12% and 14%. The lowest light intensity was in Ma'rang Sub-district ranging from 4344-5150/lux, Labakkang District 8090-9137/lux and the highest in Segeri District was 9084-10774/lux. Soil acidity (pH) in the three sub-districts ranged from 5,5-6,5. The highest temperature was indicated in Segeri District with an average temperature of 32°C and Ma'rang District with an average temperature of 28°C and Labakkang District with an average temperature of 30°C. Nitrogen content in the three sub-districts ranged from 0,12 to 0,19. K nutrient in Ma'rang, Segeri, and Labakkang Sub-district were counted 0,21%, 0,26%, and 0,31% respectively. The percentage levels of P (P2O5) in Ma'rang and Segeri District were classified as low, reaching 9.0% and 11,5%, whereas Labakkang District was categorized as moderate at 15,5%. C-Organic nutrient in the three sub-districts ranged from 1,61% to 2,25%. Pamelo citrus production in Ma'rang District was 22,36 tons/year, 6,1 tons/year in Labakkang, and 0,66 tons/year in Segeri District.

Keywords: Citrus maxima, disease intensity, root rot disease
Topics:

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The Acclimatization Compartment and Growth Hormone Impact on the Life Percentage Of Endangered Hopea Gregaria Tree Species.

Abstract. In Southeast Sulawesi province, Indonesia there is an endemic tree species with the scientific name of Hopea gregaria Slooten belonging to Dipterocarpaceae family. The wildings of this species, which is also named pooti locally, were available abundantly at Nipa-Nipa Grand Forest Park. These wildings may be collected for plant procurement programs. Unsustainable forest exploitation management in the past and also forest fire, have caused this species is classified as an endangered forest tree species in Indonesia and this tree species really needs to be sustained. This study was carried out at the greenhouse of the branch of the Indonesian Mycorrhizal Association in Southeast Sulawesi from April-June 2020. A factorial completely randomized design was used, consisting of 2 factors namely provision of acclimatization compartment, without and with cover, and Rootone-F concentration of 0, 50, 100, and 150 ppm. An analysis of variance (F-test) was used, if the result was significant it will be continued with Duncan Multiple Range Test analyses. Results revealed that the acclimatization compartment and Rootone-F interaction had no effect on all variables. However, acclimatization can increase the life percentage of shoots, wildings' height, and number and leaf length. In the beginning, natural wildings rely on acclimatization while Rootone-F increases wildings' height.

Keywords: Hopea gregaria, acclimation compartment, growth hormone, life percentage

Yohanes Wibisono (Research Centre for Ecology and Ethnobiology, BRIN), Yayan Hadiyan (Research Centre for Ecology and Ethnobiology, BRIN), Liliek Haryjanto (Research Centre for Plant Conservation, Botanical Garden and Forestry, BRIN) and Bastoni Bastoni (Research Centre for Ecology and Ethnobiology, BRIN).

Early Growth and Genetic Performance of Gelam (Melaleuca cajuputi subsp. cumingiana) Conservation Plot: An endemic peatland species in South Sumatera .

Abstract. Since the increase in peatland conversion and recurrent forest fires in South Sumatra, species biodiversity has continued to decrease. Gelam (Melaleuca cajuputi subsp. cumingiana), one of the wetland endemic species, was now threatening. A conservation plot of Gelam established at Banyuasin Regency was designed to conserve its genetic material and provide seed sources in the future. This plot was laid out in Randomized Completely Block Design, with 60 families (collected from Banyuasin and Bangka) -5 tree plots, 6 blocks, and 3 m x 3 m spacing. A preliminary study was undertaken to evaluate the growth and the genetic variation. Research results showed that the survival rate of Gelam was vary (23% to 90%) while in general, the average of Banyuasin origin was better. The effect of the population was not significant to the variation of growth and its survival rate, while the effect of families was in contrast. The individual heritability of the growth was moderate and its genetic correlation was strong (0.76). Through appropriate technical support and development strategy, this plot can be designed to provide the improved seed to boost degraded peatland rehabilitation in the region

Keywords: conservation, resources, survival

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Reducing the Effects of Greenhouse Gas Emissions of Organic Waste by Utilizing Banana Stems as Local Pig Feed Starter .

Abstract. In an effort to reduce the effects of greenhouse gas emissions from organic waste as well as to get a solution to the pig feed problem which has been competing with food, then fermented banana stems as part of the complete feed for local pig starter need to be carried out. In Tanah Papua, banana stems have been used as feed by local pig farmers but with a very simple processing method so that it has not had a significant impact on the economic traits of local pig production. The research aim is to determine an appropriate level of fermented banana stems as a complete feed for local pigs starter. A total of 12 local piglets aged about 6-12 weeks were given feed treatment using fermented banana stems at levels of 0, 5,10 and 15% . Fermented banana stems are mixed with other feed ingredients, namely commercial pig feed, sweet potato leaves, corn, fish head flour, rice bran, and cassava flour, to become a complete feed. The variables studied were the level of ration consumption, dry matter consumption, crude protein consumption, crude fiber consumption, weight gain, and feed efficiency. The data were analyzed using ANOVA with SPSS version 24 program, then the results of ANOVA gave a significant effect followed by the Tukey test. The results showed that the complete feed treatment of fermented banana stem (BPF) was quite good for local pigs starter because the pigs showed good performance. The BPF complete feed produced crude protein (CP) and metabolic energy (ME) relatively higher than the recommended Indonesian national standard (SNI) for pig starter feed. Feed treatment at 10% BPF was considered quite good based on the average daily gain (ADG) and feed efficiency (FE).

Keywords: Greenhouse, Banana Stem, Complete Feed, Pig

Safaruddin Safaruddin (Universitas Hasanuddin), Muhammad Arsyad Arsyad (Universitas Hasanuddin), Darmawan Salman Salman (Universitas Hasanuddin), Hari Hiswoyo Hiswoyo (Universitas Hasanuddin) and Syamsuddin Syamsuddin (Universitas Cokroaminoto Palopo).

Efforts to Restore the Glory of Quality Cocoa in North Luwu Regency.

Abstract. Indonesia the potential bcome the largest cocoa producing country in the world, production and quality cocoa is further improved it can compete with other countries' cocoa products. Indonesia's position is currently in third place after Ivory Coast and Ghana as the world's cocoa producer, but it can still be improved if government provides full support and support in the development of cocoa commodities. This study aims to analyze government policies in an effort to restore the glory of cocoa as a source of income in North Luwu Regency. This study data and analyzed with a system dynamics approach.

The results of analysis show that North Luwu Regency government's policy in cocoa development is quite large which implemented through several steps: 1)making cocoa top priority in agricultural development programs in the plantation sub-sector 2)budgeting policies that favor cocoa farmers both in providing seeds, production facilities and infrastructure development to access production pockets, 3)build cocoa plantations in Batu Alang and Marobo Village, 4)build cocoa mother gardens as source of rootstock seeds in Bakka Village, 5)establish partnerships with empowerment institutions cacao in empowering farmer groups, 6)rejuvenating cocoa plants from 2017 until now covering an area of 2,108 ha spread over 72 villages with total of 115 farmer groups, 7) supporting the Rural Empowerment and Agricultural Development Scaling Up Initiative (READ-SI) program in empowering farmers starting 2019-2025 with activities form socialization and identification business potential, field schools and farming intensification programs covering area of 1,173 ha in 7 subdistricts, 18 villages with beneficiary farmers many as 1,350 families and 8)supporting the sustainable agricultural system program in the Asian Tropical Landscape (SFITAL) and transformation cocoa Indonesia through value addition for small farmers (TRAKSI) 2020-2025

Keywords: Cocoa quality, production, system system dynamics, policy, farmer income
Topics:

Hendri Hendri (Universitas Papua), Aditya Rahmadaniarti (Universitas Papua) and Gede Agus Mahatmandira (Universitas Papua).

Optimization Agroforestry to Address Green Economy and Climate Change in Manokwari Regency, West Papua.

Abstract. Farm (kebun) and yard (Pekarangan), as traditional agroforestry systems that have been developed over a long period of time by trial and error based on the social, cultural, and economics of the local community. In general, the green economy value of the results of local agroforestry systems, both gardens, and yards, provides low benefits based on the real costs incurred. However, if these costs are calculated as general costs, then the local agroforestry system becomes unfeasible. Increasing the optimization of local agroforestry systems by taking into account the number of species, diversity, and carbon stock is needed in an effort to increase the green economy based on local agroforestry and mitigation efforts from the forestry sector. Data was collected from households of Bremi Village, District of Manokwari Regency using a purposive sampling method through the bio-physic inventory, and economic analysis. Through the results of the optimization of gardens and yards, there was an increase in the important value index, species diversity index, carbon stock, and economy by 37%, 19%, 53%, and 91%, respectively. Through the optimization of agroforestry practices (OAPs), the production scale is expected to improve the local community income as well as to preserve typical species, environmental conservation, long-term strategies for extreme climate conditions, and support the Low Carbon Development Indonesia program (LCDI) in West Papua.

Keywords: local agroforestry practices, optimization of agroforestry practices, green economy, extreme climate conditions, LCDI

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Evaluation of Urban Landscape Management for Waterfront City in the Coastal Makassar City.

Abstract. Makassar City is one of the coastal cities in Indonesia that has the potential for economic development, provides clean air and water. As an effort to take advantage of this potential, Makassar City government, through the Regional Spatial Plan 2015–2034 has a goal to realize the city area based on the concept of a waterfront city. However, massive development activities cause environmental problems, such as changes in coastal morphology, changes in land use, decreased water quality, and damage to mangrove areas. So it is necessary to evaluate the coastal landscape management of Makassar City to assess the landscape of the coastal area based on the planned targets. This study aims to inventory, map, and evaluate coastal landscape management based on the waterfront city concept, and also to analyze public perception regarding the implementation of waterfront city. The methods used are remote sensing to assess land suitability, assessment of comfort and landscape beautification using the Thermal Humidity Index (THI) and Scenic Beauty Estimation (SBE) methods, and field observations. The results of this research will issue a policy brief as a reference and groundwork in regenerate the ordinance in Makassar's coastal city landscape management, to improve costal landscape services, and to achieve the goal of Makassar City as a World City in regional regulations.

Keywords: Coastal Landscape, Landscape Services, Thermal Humudity Index (THI), Scenic Beauty Estimation (SBE)

Rudi Maturbongs (Faculty of Forestry, Graduate Program, University of Papua).

PRIORITY RATTAN SPECIES IN BIRD HEAD PENINSULA OF NEW GUINEA, INDONESIA.

Abstract. ABSTRACT

There are four species of rattan in the Bird's Head Peninsula of New Guinea which are known to have stem quality that meets international standards similar to that of Rattan Manau (Calamus manan) which has been known in the world rattan market, namely Calamus aruensis, C. fertilis, C. heterachantus, and C. heterachantus. C. zebrinus. In order to support the rattan conservation program through the successful and sustainable development of community rattan plantations, the distribution and ecological aspects of these priority rattan species need to be studied and understood. Quantitative-qualitative method is used in this research by applying statistical principal component analysis technique. The results showed that C. aruensis and C. heterachantus had a broad distribution pattern in the Bird's Head Peninsula area with the same ecological preferences. Meanwhile, C. zebrinus and C. fertilis distribution patterns are more limited to certain locations with ecological preferences for soil types that are similar to the two previous species of rattan, such as Alluvium, brown podzolic, gray brown podzolic, red-yellow podzolic, podzolic complex. Soil type, annual rainfall, topography and geology factors influence the distribution pattern of priority rattan species. The four priority species of rattan are categorized as lowland rattan species because they are more often found in habitats below 700 m above sea level. The four species of rattan are traditionally used by ethnic groups in the Bird's Head region of New Guinea to meet their various needs, ranging from food, medicine, rigging, weaving, to bowstrings.

Keywords: Rattan, Bird's Head, New Guinea, Indonesia

Daniel Dudung (Ph.D Student of Doctoral Program, Papua University. Papua Barat, Indonesia), Barahima Abbas (Department of Agrotechnology. Papua University. Papua Barat, Indonesia), Eko Martanto (Department of Agrotechnology. Papua University. Papua Barat, Indonesia), Ihwan Tjolly (Department of Agrotechnology. Papua University. Papua Barat, Indonesia), Trisiwi Wahyu Widayati (Department of Animal Science, Papua University. Papua Barat, Indonesia) and Denny Iyai (Department of Animal Science, Papua University. Papua Barat, Indonesia).

Estimation of Greenhouse Gases in Rice Fields and Plantations in Teluk Bintuni Regency, West Papua.

Abstract. The agricultural sector contributes to the formation of GHGs into the atmosphere such as methane (CH4), nitrogen dioxide (NO2) and also carbon dioxide (CO2). These GHG emissions are generated from agricultural activities such as land cultivation, use of fertilizers and rice cultivation. The purpose of this study was to estimate the amount of greenhouse gases produced by the agricultural sector in Teluk Bintuni Regency. Data were taken from 15 farmer groups from 15 districts, and 6 families of rice farmers assisted by Tangguh LNG CSR in Teluk Bintuni Regency. The calculation method uses IPCC 2006 Tier 2. The correction factor used in calculating Bintuni's GHG is adjusted based on land area, soil type, type of fertilizer, type of irrigation used. The calculation results show that paddy farming activities by rice farmers assisted by Tangguh LNG CSR produce CH4 of 964.45 kg/year, or CO2 of 22,182.45 kg/year. Fertilization activities on paddy fields using urea produced direct emissions of 1292.47 kg CO2, indirect emissions of 420.05 kg CO2, fertilizing activities of paddy fields using NPK produced direct NO2 emissions equivalent to 439.02 kg CO2, and indirect emissions of 142.68 kg CO2 . Fertilization activities on plantation land using ZA fertilizer produced direct NO2 emissions of 2894 kg CO2 and indirect emissions of 940.69 kg CO2, NO2 emissions from NPK fertilizer produced direct emissions of 5920.41 and indirect emissions of 1924.13 kg CO2. It is necessary to further implement low-emission agricultural activities through fertilization of the right size and selection of rice varieties and low-emission irrigation systems.

Keywords: Greenhouse Gases, Rice field farming, Gardening, Bintuni Bay

Reymas M.R Ruimassa (Fakultas Pertanian Universitas Papua), Yolanda Holle (Fakultas Pertanian Universitas Papua) and Ifa Manzila (Balai Besar Pengembangan dan Penelitian Pertanian dan Sumber Daya Genetik Bogor).

Fragmen Endogenous Like Rice Tungro Bacilliform Virus (RTBV) di dalam Genom Padi Lokal .

Abstract. Virus tungro disebabkan oleh dua jenis virus yaitu rice tungro basilliform virus (RTBV) dan rice tungro spherical virus (RTSV), kedua jenis virus tersebut tidak memiliki hubungan kekerabatan satu dengan yang lainnya. RTBV adalah virus double stranded (ds) DNA yang termasuk pada famili Caulimoviridae sedangkan RTSV adalah Sequiviridae ssRNA. Partikel virus RTBV memiliki panjang 130 nm dan diameter 30 nm, sedangkan RTSV berbentuk bulat dengan diameter 30 nm. DNA untai ganda yang mirip dengan RTBV diketahui terintegrasi dalam genom tanaman inang padi yang dinamakan endogenous-like RTBV (ERTBV). Sampai saat ini, mekanisme integrasi genom virus ke dalam genom inangnya belum banyak dipahami, tetapi sudah banyak dilaporkan dari golongan pararetrovirus yang memiliki genom berupa DNA untai ganda. Penelitian ini bertujuan untuk (1) mengetahui keberadaan endogenous-like RTBV di dalam genom padi (2) mengetahui posisi integrasi endogenous-like RTBV di dalam genom padi. Penelitian dilakukan dengan menggunakan metode deskriptif dengan teknik studi kasus, sebagai kasus adalah terintegrasinya fragmen sekuens RTBV ke dalam genom padi lokal. Hasil penelitian menggunakan PCR menunjukkan bahwa endogenous RTBV benar terintegrasi di dalam genom padi dengan bobot 1200 kb dengan menggunakan primer ERTBV-7. Hasil blast nukleotida menunjukkan bahwa similaritas endogenous RTBV padi lokal Indonesia dengan endogenous RTBV padi di genbank berkisar diantara 89% dan 99%, selanjutnya hasil blast protein menunjukkan bahwa fragmen ERTBV padi lokal mengandung rotein ORF 3 RTBV yang menyebar merata di seluruh lokus padi lokal dengan kisaran similaritas dengan genbank 84.15% dan 97.58%.

Keywords: endogenous RTBV, primer ERTBV-7, blast N, blast X, Utri Merah, padi lokal

Didi Usmadi (Research Center for Ecology and Ethnobiology, National Research and Innovation Agency), Richa Kusuma Wati (Research Center for Biosystematics and Evolution, National Research and Innovation Regency), Ria Cahyaningsih (Research Center for Plant Conservation, Botanic Gardens, and Forestry, National Research and Innovation Agency) and Danang Wahyu Purnomo (Research Center for Plant Conservation, Botanic Gardens, and Forestry, National Research and Innovation Agency).

Maxent modeling for predicting the current and future potential geographical distribution of Crepidium ridleyi (J.J.Sm.) Szlach., a threatened endemic terrestrial orchid of Java.

Abstract. Crepidium ridleyi (J.J.Sm.) Szlach is one of the endemic terrestrial orchids from Java. Due to rapid development and the high rate of land degradation, it faces a serious threat of extinction. In this study, the impact of climate change on the specific habitat of this species within Java was simulated using the future greenhouse gas emission scenarios of RCP4.5 and RCP8.5 for a mid-term future projection to 2050 and a long-term future projection to 2080. The current and future of this species distribution model showed that habitat suitability is declining. In addition, there is no record of the species in the in-situ area. Thus, supporting this species in-situ and ex-situ conservation efforts is strongly advised.

Keywords: endemic orchid, climate change, habitat, conservation, Java

Iftitah Kartika Amaliah (HASANUDDIN UNIVERSITY), Itji Diana Daud (HASANUDDIN UNIVERSITY) and Andi Nasruddin (HASANUDDIN UNIVERSITY).

Effect of several reduced-risk insecticides on population of Bemisia tabaci Genn. and incidence of Pepper yellow leaf curl Indonesia virus (PepYLCIV) on chili plants.

Abstract. Tobacco whitefly, Bemisia tabaci Genn. can directly and indirectly damage chili plant by sucking the plant sap and transmitting Pepper yellow leaf curl Indonesia virus (PepYLCIV), respectively. Farmers control PepYLCIV by using synthetic insecticides with 2-3 applications a week to suppress the vector population. The intensive use of the insecticide raises a concern of potential detrimental effects on the environment and non-target organisms. An alternative control measures for B. tabaci is the use of reduced-risk insecticides that are effective but safer. Thus, the study aimed to determine the effectiveness of various reduced-risk insecticides in reducing the whitefly population and PepYLCIV incidence. This experiment consisted of 12 treatments using insecticides of abamectin, azadiractin, imidacloprid, deltamethrin, spinosad, and water (control), applied once and twice a week. The results showed that the low risk insecticides had no significant effect on the numbers of adults and nymphs of B. tabaci and the PepYLCIV incidence. Imidacloprid had significantly lower egg number and PepYLCIV incidence than the control and the other insecticide treatments. Our results also showed that B. tabaci populations were low throughout the season but the incidences of PepYLCIV were relatively high. This indicated a possibility that PepYLCIV is seed-borne.

Keywords: Bemisia tabaci, Pepper Yellow Leaf Curl Indonesia Virus, Low Risk Insecticide.
Topics: Biodiversity

Paulus Boli (Universitas Papua), Talita A. Asagi (Universitas Papua), Alberto Y.T. Allo (Universitas Papua), Revolson Alexius Mege (Universitas Negeri Manado), Emma Mauren Moko (Universitas Negeri Manado), Alfonds Andrew Maramis (Universitas Negeri Manado), Daniel Tadu (Universitas Papua) and Gandi Y.S. Purba (Universitas Papua).

HATCHING SUCCESS OF SEA TURTLES CHELONIA MYDAS AND LEPIDOCHELYS OLIVACEA AT SIBUNI VILLAGE, MASNI DISTRICT MANOKWARI REGENCY WEST PAPUA.

Abstract. Green sea turtle (Chelonia mydas) and olive ridley sea turtle (Lepidochelys olivacea) are the turtles that most often come to Sibuni Village to lay their eggs in the spawning season. The purpose of this study was to determine the successful hatching of the eggs of these two turtles in natural and semi-natural nests. The method used for this research was a descriptive method with data on the number of turtle eggs in the nest, successful hatching of eggs, nest temperature, and incubation period. There were 20 nests containing eggs. Four nests belong to the green sea turtle, which are 2 natural nests and 2 semi-natural nests. The olive ridley sea turtles had 16 nests which are 9 natural nests and 7 semi-natural nests. The results of the study found that the number of green sea turtle eggs was 382 eggs from 4 mothers. The number of olive ridley sea turtle eggs was 1,613 eggs from 16 mothers. The average successful hatching of green sea turtles was 87.4-4.4%. The hatching success of natural-nest of olive ridley sea turtles was 92.1-3.2% and semi-natural was 89.5-4.4%. Measurement of nest incubation temperature of the natural nest of green sea turtle was 26-28 °C and semi-natural was 29-32 °C. Another turtle's natural nest was 26-28 °C and semi-natural was 27-31 °C. The incubation period for green sea turtle eggs was 58.75 days (57-60 days), while olive ridley sea turtle eggs were 57.43 days (55-59 days). Hopefully, the results of this research can support turtle conservation activities in Sibuni Village, Masni District at West Papua.

Keywords: green sea turtle, olive ridley sea turtle, Chelonia mydas, Lepidochelys olivacea, West Papua, hatching success

Charles Ham (University of Hawaii).

Multi Science Approach in Utilizing Low-Cost Nature-Based Infrastructures and Citizen Participations for Flood Risk Reduction in Ternate City.

Abstract. Cities are formed naturally by dwellers over the years and adjusted to the conditions, knowledge, tools and technology available. Ternate City has seen 771 years of history, maybe up to four millenniums as its clove were proved to be in Babylonia as in the world's oldest cooking recipe (Winchester, 2019). The lust rainforest on the island provided an ample supply of water for the clove trees as they traveled the world in providing medicinal benefits at the equivalent value of gold. However, the expansive human population failed to manage the rainwater blessings and causing cursed floodings around the city. We explored the need of science, mitigation, policy evaluation, social intelligence & sustainability, economic impact, urbanization and green infra structures as the city need to consider how to improve the island city in decades and millennium forward. Multi sciences approach needs to be utilized to address the different variables that will help build resilience and sustainability of decorated historic city.

Keywords: nature-based green infrastructures, citizen participation, flood disaster risk reduction, climate change adaptation, sustainable and resilient cities, mitigation, multi science approach, urban planning, policy evaluation

Martina Langi (Sam Ratulangi University).

Estimation of Total Biomass and Carbon Stock in the Tangkoko Nature Reserve, North Sulawesi.

Abstract. The purpose of this study is to estimate total biomass and carbon stock in the Tangkoko Nature Reserve estimated from aboveground (AGB), belowground (BGB), dead wood, litter, and organic soil pools. The approved consolidated methodology was used (AR-ACM0002 from UNFCCC), and ata were collected using stratified systematic sampling with a maximum sampling error of 20% (SNI 7724:2019). The chosen allometric equation used was based on the amount annual rainfall (1500-4000 mm.yr-1) considering that aboveground biomass in tropical forests is mainly contained in trees which is the function of diameter and height. Results showed that the calculation of total biomass in the Tangkoko Nature Reserve equals to 416.47 Mg.ha-1 with the biggest proportion contributed by AGB (trees) (49%) followed by BGB (24%), organic soil (13%), deadwood (11%), and litter (3%). Furthermore, the C stock was calculated using SNI 7724:2019 that is 47% of biomass.

Keywords: biomass, C-stock, forest

Rina A. Mogea (Pascasarjana Universitas Papua), Yayuk Fitriani (Jurusan Biologi FMIPA Universitas Papua) and Yenni S. Salosa (Jurusan Biologi FMIPA Universitas Papua).

Biocontrole of Bacillus cereus for Anopheles sp larvae.

Abstract. Biological control is one of the best ways for eradication of mosquitoes because it's done by using natural antagonist such as microbe. Research objectives is to determine concentration value of local isolate Bacillus cereus which cause 50% mortality and 95% mortality toward Anopheles larvae (instars 3) and to know how long Bacillus cereus AOT9 can survive in the LC95 until mortality of larvae Anopheles decreases to 70% in laboratory condition. Research was done experimentally with six different concentrations (10,20,30,40,50 and 60 ppm) also using three repetitions. Result shown that there is no mortality of Anopheles larvae in control sample, 43% mortality for each repetition in 10 ppm and the highest mortality is 98 % in 68 ppm. Also, mortality of Anopheles larvae 50% in the concentration of 20 ppm to 30 ppm. Probit analysis for Bacillus cereus at LC50 was 27,93 ppm and LC95 was 57,43 ppm. Residual test for mortality Anopheles' larvae in the first 48 hours was 96,7% from total in the three repetitions and then decrease to 70% in the 336 hours or day 14. To conclude Bacillus cereus has potension as biopesticide toward Anopheles sp and can be developed to know bioactive compound in Bacillus cereus.

Keywords: biopesticide, Anopheles sp, Bacillus cereus, Malaria

Suriani S (Research Center for Food Crops, Research Organization for Agriculture and Food, BRIN), Nurasiah Djaenuddin (Research Center for Food Crops, Research Organization for Agriculture and Food, BRIN), Endang Gati Lestari (Research Center for Food Crops, Research Organization for Agriculture and Food, BRIN), Amin Nur (Ministry of Agriculture Republic Indonesia) and Fandi Abdullah Nadir (Fisheries and Agriculture Agency of Makassar).

The Performance of Sorghum Mutant Lines Resulting from Gamma-ray Mutation on Main Diseases.

Abstract. Sorghum (Sorghum bicolor) is a cereal plant that has prospects for commercial development in Indonesia because it can adapt widely on sub-optimal land and has multipurpose benefits for food and feed raw materials and bioenergy. Problems in the development of sorghum include the attack of detrimental plant diseases because they can reduce production by up to 50%. For this reason, it is necessary to assemble new disease-resistant varieties. The study aimed to obtain sorghum mutant lines from the Numbu variety resistant to 3 major diseases (leaf rust, leaf spot, and anthracnose. The research was conducted at the ICERI Experimental Garden. The treatments were arranged using a Randomized Block Design with 3 replications with materials tested were five mutant lines derived from a Numbu variety (lines MM-5, MB-3. MB-5. MM-3, MM-4) and resistant comparison varieties (Kawali and Numbu) and check susceptibility lines (Super 2 and line SRN48-1) as a comparison for each disease. The results showed that the five test genotypes had high resistance to 3 main sorghum diseases. The MB-3 and MB-5 mutant lines were resistant to leaf rust and leaf spot Cercospora, and moderately resistant to anthracnose. The lowest infection rate of leaf rust disease was in the MB-3 line, which was 0.00304. This illustrates the low development of rust disease in these lines. While the other 3 strains (MM-3, MM-4, and MM-5) consistently reacted moderately resistant to the 3 main diseases of sorghum. The test results concluded that mutations using gamma rays produced mutants that were resistant and moderately resistant to the main disease so that they were eligible to be released as new varieties.

Keywords: anthracnose, leaf spot, leaf rust, sorghum mutant
Topics: Biodiversity

Yuyu Rahayu (University of Papua) and Susilo Budi Husodo (University of Papua).

Wood anatomical variables and its relation to site and climate adaptation in tropical rain forest of Papua.

Abstract. The study is to confirm the relationships amongst wood anatomical traits to the external growth factors. 15 rain tropical tree species were studied across plant families and a micro-scale climate of tropical forest in Kaimana, Papua. The wood anatomical traits and percentage of vessel area, parenchyma and fiber area were analyzed in individual tree rings. The result of the research showed that the differences within and inter-species individuals tree shows that tree is adapting to the environmental variability. We also found that the variability of vessel diameter is significantly correlated to other wood anatomical traits (i.e. cell wall thickness, the percentage of three main wood tissues, wood density and vessel density). It also confirmed that the specific hydraulic conductivity (Ks) positively associated with the potential hydraulic diameter. This illustration is indicating a strong tradeoff between the hydraulic diameter potential and the vessel density, which is also lead to the positive correlation between specific hydraulic conductivity (Ks) to the vessel size. A high stomatal conductance indicates more carbon dioxide is available for photosynthesis, leading to high carbon gain and eventually high growth rates. The ecological strategies and wood density were found as the best predictor of tree growth and survival rates of different species in the rain tropical forest of Papua.

Keywords: wood anatomy, ecological strategies, vessel, wood density, parenchyma, fiber

Prihartanto (Indonesia National Research and Innovation Agency, Puspiptek Serpong, Indonesia), Novian Andri Akhirianto (Indonesia National Research and Innovation Agency, Puspiptek Serpong, Indonesia), Syakira Trisnafiah (Indonesia National Research and Innovation Agency, Puspiptek Serpong, Indonesia), Bana Fitro Ghifari (Indonesia National Research and Innovation Agency, Puspiptek Serpong, Indonesia), Deliyanti Ganesha (Indonesia National Research and Innovation Agency, Puspiptek Serpong, Indonesia), Muhammad Ravi Yuvhendmindo (Indonesia National Research and Innovation Agency, Puspiptek Serpong, Indonesia) and Fanny Ainunnisa (Indonesia National Research and Innovation Agency, Puspiptek Serpong, Indonesia).

Social vulnerability toward tsunami hazard in the coastal area of Bayah Dome Geopark, in Lebak Regency, Banten Province.

Abstract. The prominent character of geodiversity, biodiversity, and cultural diversity in Bayah Dome coastal has encouraged the Lebak Regency government to promote Bayah Dome Geopark (BDG) in 2020, primarily for tourism. However, a potential earthquake could trigger a tsunami from the subduction zone, which causes social vulnerability. This study aims to develop a social vulnerability model for the tsunami disaster in the BDG area based on the population exposed to the disaster and the vulnerable group's ratio parameters. This model modified the classical social vulnerability parameter by changing the population density parameter to the potential people exposed to disaster. This model consisted of sub-district permanent resident density and sub-district tourist visits variables (considering the area is a tourist destination) with a weight of 30% each. Meanwhile, the vulnerable group's ratio consisted of sex, group age, and disabled population ratios of 13.33 % each. This research was conducted in the southern part of the BDG coastal area, consisting of Wanassalam, Cilograng, Panggarangan, Bayah, Malingping, and Cihara sub-districts in the Lebak Banten Regency. The model used low, medium, and high vulnerability levels of 1 – 1.67, 1.68 – 2.33, and 2.34 – 3.0 to determine each sub-district vulnerability using regional statistics (2016 – 2020) and tourist visits (2017 – 2021) data of Lebak Regency. The results showed that between 2017 – 2020 Bayah and Malingping sub-districts had a medium social vulnerability with a range of 1.7 – 2.0 on a 3.0 scale, in which Bayah was the highest of 2.0 due to a large number of tourist visitors. Meanwhile, Wanasalam, Cilograng, Panggarangan, and Cihara had a low social vulnerability with a range of 1.1 – 1.4, except for Cilograng in 2019, of 1.7. Therefore, it is recommended to prioritize social intervention for Bayah and Malingping sub-districts to upgrade community capacity for tsunami hazards.

Keywords: Disaster, Tsunami, Geopark, Social, Vulnerability, Lebak

Pither Palamba (Cenderawasih University) and Anastasya Sri Werdhani (Cenderawasih University).

Smoldering Behavior of Peat Fire.

Abstract. So far, research on peatland fires is still being carried out to study the kinetics of combustion, smoke gas emissions, as well as extinguishing and conservation. This study aims to describe the propagation rate and temperature of smoldering combustion both on dry and wet peat, carried out both on a laboratory and in the field, with samples taken from Sarmi district in Papua province, Pulang Pisau district in Central Kalimantan province, and Palembang in South Sumatra province, as well as field test in Rokan Hilir distric in Riau Province.

Test with an air supply of 3.98 cm/s resulted a smoldering temperature reached of 650.28℃ with a propagation rate of 10.12 cm/hour, and at the transition to flaming the temperature is reached 1172.40℃. In an uniform dry layer of peat, combustion undergoes each stage of fuel oxidation (FO) and char oxidation (CO) with propagation rates at the FO stage of 7.5 cm/h, 6.57 cm/h and 555 cm/h, respectively, and at the CO stage of 1.24 cm/h, 1.05 cm/h and 0.63 cm/h, respectively for South Sumatra, Central Kalimantan and Papua peat; in the peat layer with stratified MC, the stages of fuel oxidation are not clearly visible and the rate of smoldering propagation decreases from the surface to a depth of 17.5 cm (in layers with high MC), namely 2.25, 1.80, 1.42, 0.94, 0.69, 0.41 , and 0.22 cm/h for every 2.5 cm lowering from the surface. The laterally propagation rate on dry samples at a depth of 2.5 cm, 5.0 cm, 7.5 cm, and 10 cm were reached 0.766 cm/h, 0.99 cm/h, 1.025 cm /h and 3.055 cm/h, respectively. Meanwhile, on a field scale test, at a depth of 20 cm, the propagation rate of smoldering is radially ~2.51 cm/h while diagonally to a depth of 40 cm is ~3.46 cm/h.

Keywords: peat, moisture content, smoldering combustion, temperature, smoldering propagation

Aris Sudomo (National research and inovation agency indonesia) and Marcellinus Mandira Budi Utomo (National research and inovation agency indonesia).

The Fundamental Role of Silviculture Agroforestry in Indonesia's Social Forestry Program.

Abstract. Community-based Forest management is expected to be able to create sustainable forests and more prosperous communities. Social Forestry is a forest area management system by Local Communities to improve welfare, environmental and socio-cultural balance. Agroforestry practices as a tool to achieve the SDGs. Forms of Social Forestry are Village Forests, Community Forests, Community Plantation Forests, Customary Forests and forestry partnerships. In 2021, the land area for social forestry in Indonesia has reached 14,061,562 ha. Social forestry is a community empowerment that is not only land capital but also skills and knowledge improvement, especially silviculture agroforestry. The adoption of agroforestry in social forestry programs is constrained by competition between agricultural and forest crops. The diversity of site conditions in Indonesia demands the preparedness of a silvicultural guideline of agroforestry implementation in order to achieve both more sustainable forests and more prosperous forest people.

Keywords: community., silviculture agroforestry, sustainability

Johanna Audrey Leatemia (Pattimura University), Betty Sahetapy (Pattimura University), Esther Dolfina Masauna (Pattimura University) and Tryani J.K. Lumbantoruan (Pattimura University).

Insect Diversity in "Dusung"- An Indigenous Agroforestry System in Ambon Island, Maluku, Indonesia.

Abstract. Insects can be found in a variety of habitats terrestrial and aquatic (fresh water). The ecological role or ecosystem service of insects is very varied and they dominate food chains and food webs. Dusung is an agroforestry system native to farmers in Maluku where farmers grow a combination of perennial, annual, and forest plants (polyculture). The objective of this research was to obtain a measure of diversity (diversity, dominance and similarity indexes) of insects in nutmeg dusung and fruits dusung in Ambon Island. Four nutmeg dusung and four fruits dusung were purposively selected in Ambon Island. Four types of traps namely yellow sticky, pitfall, bait and light traps were used to collect the insects in each dusung. Insects collected in nutmeg and fruits dusung on the island of Ambon consisted of 7 orders, 29 families and 44 species with a total insect population of 2,449 individuals. Insects collected in nutmeg (Myristica fragrans) dusung consisted of 35 species belongs to 24 families and 7 orders. Insects collected in fruit dusung on the island of Ambon with various traps consisted of 25 species belonging to 17 families and 7 orders. The Shannon-Warner index of insect species diversity in nutmeg and fruit dusung were 2.275 and 1.523 respectively (both are moderate) while the Simpson dominance index in nutmeg and fruit dusung were 0.141(low) and 0.38 (moderate) respectively. The Jacard similarity index of insects between the two ecosystems was 0.36 (moderate).

Keywords: diversity, insect, agroforestry, nutmeg, Myristica fragrans

Sugiarto Sugiarto (Universitas Papua), Hendri Hendri (Universitas Papua) and Jacob Manusawai (Universitas Papua).

Eco-Temple Initiative for Achieving Sustainable Development Goals in West Papua.

Abstract. The purpose of this research is to examine the eco-temple concept in the context of sustainability, research, tourism, and technology adoption in two temple in West Papua. The data were obtained from the results of surveys and interviews with community leaders at the Prabha Buddha Manokwari Temple and Sorong Buddhist Temple. The results of the study show that the ecological and social aspects are more dominant than the economic side in the assessment of sustainable communities, then the tourism aspect is also a follow-up due to environmentally friendly designs and natural beauty. However, the concept of research and technology adoption is included in the medium category so that further research is needed to improve the components that are still lacking.

Keywords: Eco-temple, sustainability, research, tourism, technology adoption

Yusup Jentewo (Program Sains untuk Konservasi, Lembaga Penelitian dan Pengabdian kepada Masyarakat, Universitas Papua), Deasy Lontoh (Program Sains untuk Konservasi, Lembaga Penelitian dan Pengabdian kepada Masyarakat, Universitas Papua), Petrus Batubara (Program Sains untuk Konservasi, Lembaga Penelitian dan Pengabdian kepada Masyarakat, Universitas Papua), Tonny Duwiri (Program Sains untuk Konservasi, Lembaga Penelitian dan Pengabdian kepada Masyarakat, Universitas Papua), Arfiandra Wanaputra (Program Sains untuk Konservasi, Lembaga Penelitian dan Pengabdian kepada Masyarakat, Universitas Papua) and Fitryanti Pakiding (Program Sains untuk Konservasi, LPPM, Universitas Papua ; Fakultas Teknologi Pertanian, Universitas Papua).

Opened Sasi Helped Reduce Predation on Leatherback Turtle (Dermochelys coriacea) Nests at Jeen Yessa Beach, Tambrauw.

Abstract. Jeen Yessa beach is part of the Jeen Womom Coastal Park, one of the critical nesting beaches for leatherback turtles (Dermochelys coriacea) in West Papua. Predation by wild boar (Sus scrofa) is the primary threat to leatherback nests at Jeen Yessa. Wild boar is an introduced species that have become naturalized in the area. The LPPM UNIPA team with local community members constructed enclosures around individual nests to protect threatened nests but we are unable to protect all of them.

The Yessa clan of Abun tribe residing in Resye and Womom villages own Jeen Yessa. They constructed a set of customary rules called Sasi to manage natural resources between the Warmandi cape in the east to the Refun cape in the west. During "opened Sasi," local community members can set snares or hunt in the forest to capture wild boars and deer and were prohibited during “closed Sasi". The rules banned the taking of all turtles, including leatherbacks, and some rare animals.

We compared the number of leatherback nests depredated when sasi was closed from 1 April to 11 June 2021 and when sasi was opened from 11 June to 30 September 2021. There were 1791 leatherback nests during the April-September nesting season, and 307 were depredated by pigs (17%). During closed Sasi, 267 leatherback nests were depredated but this number was reduced to 40 nests during opened Sasi, this is a decrease of 85%. Although not quantified here, reduction in the number of wild boars also helped lower the predation level of other marine turtle nests. During the open Sasi period, ten local community members set snares in the forest along the total length of Jeen Yessa and captured 123 wild boars. In this context, Sasi benefited marine turtles when it was opened by reducing the number of predators.

Keywords: Leatherback, Sasi, Predation

Cicilia Maria Erna Susanti (Faculty of Forestry Papua University), Helmy Y. Setiabudi (Faculty of Forestry Papua University), Nurhaidah Iriany Sinaga (Faculty of Forestry Papua University), Zita Letviany Sarungallo (Faculty of Agriculture Technology Papua University), Diana Nurini Irbayanti (Faculty of Agriculture Papua University), Marsia A.R. Rumateray (Faculty of Forestry Papua University) and Fence F. Aidore (Faculty of Forestry Papua University).

Characteristic and The Potential Use of Pandanus Tectorius Park. Leaf Bio-Briquette.

Abstract. Briquettes are formed materials that can be used for many purposes, such as energy sources, absorbers and other purposes. One of the raw materials for making briquettes is biomass, which is a material containing lignocellulose. One of the lignocellulose sources is Pandanus tectorius Park. is widely distributed around the world, especially in tropical coastal area. The plant has not yet utilized to maximum potency, as a source of bio-briquette. The aim of the research is to develop formulation of bio-briquette made from P. tectorius Park. leaf with the binding agent tapioca starch and Acacia mangium bark powder. The research has been conducted by using P. tectorius Park. leaf from Amban beach area, Manokwari and A. mangium bark from Sidey, Manokwari. The formulation of P. tectorius Park leaf powder and binding agent used as bio-briquette mixture is 80%:20% and 70%:30%. The bio-briquette uses a hot press with a temperature of 125oC for 2 hours. After 2 hours of heating, applied heat is removed, then pressurized briquettes is left for 6 hours of conditioning. Some properties of the bio-briquette used SNI standard of charcoal briquette to determine the quality of the briquettes. The result of the research found that the moisture content of briquettes with formulations containing more adhesives (70%:30%) is lower in water content, while the density is relatively higher. The thickness development tends to be higher in the ration of briquette 70%:30%. While the value of volatile matter content and ash content did not differ. The moisture content and ash content of the briquettes qualify SNI standards, but further analysis is still needed to determine the accuracy of the use of these briquettes.

Keywords: bio-briquette, Pandanus tectorius Park., Acacia mangium bark

Rico Rico (Hasanuddin University), Rahim Darma (Hasanuddin University), Darmawan Salman (Hasanuddin University) and Mahyuddin Mahyuddin (Hasanuddin University).

Characteristics That Affect The Performance of Arabica Coffee Farmers.

Abstract. Characteristics of farmers show the performance of farmers in running better and more sustainable farming. This study aims to analyze the effect of farmer characteristics on the performance of Arabica coffee farmers in North Toraja Regency. This study used a survey method with a quantitative descriptive approach. This research was conducted in North Toraja Regency on March 2022. The effect of farmer characteristics on farmer performance was analyzed using multiple linear regression analysis. Analyzing the effect of farmer characteristics on farmer performance, it was found that farmer characteristics (income, education, family responsibilities, farming experience, gender, and age) had a positive influence on farmer performance.

Keywords: Farmer Characteristics, Performance, Influence, Arabica Coffee

Masfiro Lailati (BRIN) and Yati Nurlaeni (BRIN).

The growth of Mount Gede Pangrango National Park native plant in CBG nursery: Preliminary study.

Abstract. Gunung Gede Pangrango National Park is a conservation area located at three districts in West Java, namely Bogor, Sukabumi, and Cianjur. The composition of the ecosystem in this National Park is very distinctive, both on the vegetation and animals. Among the dominant vegetations that grow in sub-montane and montane (1000 – 2400 m asl) in this ecosystem are Altingia excelsa Noronha (Rasamala), Schima wallichii (DC.) Korth. (Puspa), and Castanopsis argentea (Blume) A.DC. (Saninten). This study aims to determine the growth rate of three seedlings sown in the Cibodas Botanic Gardens nursery. Cibodas Botanic Gardens (CBG) is an ex-situ conservation area located on the feet of Mount Gede-Pangrango. The conserved plants in CBG are highland species. Three dominant plants of TNGGP were sown from seeds in CBG. Measurement of seedling growth was carried out three times. The growth of Rasamala and Puspa showed an increase on the average of stem diameter and SPAD parameters but not on the average of height. On the other hand, the growth of Saninten showed an increase on the average of height parameter but not on the average of diameter and SPAD. Some seedling growth is deficient due to the weather factors and the growing media condition. This experiment was conducted as a preliminary study to determine the growth rate in the same media and treatment, and determine the next method to increase the growth and support in situ and ex situ conservation efforts on these three species.

Keywords: Plants, native, growth, conservation

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Arena Characteristics, Actors, And Resources Management Regulations in Providing Hybrid Corn Seeds for Farmers.

Abstract. The availability of the seed production arena and the skills of the actors in applying the operational standards of seed production (SOP) are very important factors in supporting sustainability of seed company. The study aims to identify the arena characters and actors of multinational companies (MNC) for guideline in improving the performance of the national seed system (NC). Both were chosen on the basis of the similarity of the location and the character of their human resources, but their performance was different. The case study approach focus to discript three aspects namely: managerial pra production, post harvest, and marketing process. Collecting data by In-depth interviews and discussions, as well as field observations on production, processing, and marketing process. The results showed that, the management of hybrid corn seed production at MNC was better, superior, more effective, more disciplined than the management of seed production at NC. That's can be seen in: (1) in the production aspect in the field, there are two prominent differences, namely:(a) adherence to the SOP instructions and deviations tolerated, (b) management of supervision of technologyapplication, MNC is more orderly in fertilizing, weeding, planting and controlling pests. First fertilization is confirmed to be done at the 7-10 days after planting (dap), while for NC it is sometimes more than 10 dap. Likewise, weeding and pest/disease control at MNC are all be done on time based SOP. (2) in the seed processing aspect, the two seed companies have used modern aquipment, almost all activities are carried out by machine power except cobs sortion and seeds treatment still by manual. (3) in the marketing aspect, MNC companies are more advanced, more dynamic in developing their marketing networks compared to NC. Marketing digitalization system has be done by MNC, while NC was still dominantly carried out conventionally.

Keywords: Hybrid corn seed, Company, National, Multinational

Saraswati Prabawardani (Universitas Papua), Darma Jumaria Yogi (Department of Agriculture, Livestock and Fishery, Bintang Mountains Regency, Papua), Yohanis Amos Mustamu (Agricultural Science Study Programme, Postgraduate of Papua University, Manokwari, West Papua), Nouke L. Mawikere (Agricultural Science Study Programme, Postgraduate of Papua University, Manokwari, West Papua), Alce Ilona Noya (Agricultural Science Study Programme, Postgraduate of Papua University, Manokwari, West Papua), Ni Made Gari (Biology Study Program, Faculty of Mathematics and Science, Udayana University, Denpasar, Bali), Sartji Taberima (Soil Department, Faculty of Agriculture, Papua University, Manokwari, West Papua) and Irnanda A.F. Djuuna (Soil Department, Faculty of Agriculture, Papua University, Manokwari, West Papua).

Agro-Morphological and Nutritional Traits of Potato Genotypes in Oksibil and Anggi Highland Areas of Papua.

Abstract. Potatoes are very potential food crop in terms of economic value and food security, and therefore need to be considered in its development. Potato production in Oksibil, Papua, and in Anggi, West Papua has decreased from time to time. A number of potato genotypes that were introduced by the missionaries in the 1959-1960s in the land of Papua are reported to be difficult to find nowadays. The objective of this research was to identify the agro-morphological characteristics and to analyze the nutritional traits of its tuber. The research was conducted in Oksibil, Bintang Mountain Regency of Papua Province and in Anggi, Arfak Mountain Regency of West Papua Province from November 2019 to February 2020. The research was designed using a descriptive method, and the samples were collected based on a random sampling technique. The agro-morphological observations refer to the descriptors from the International Board for Plant Genetic Resources (IBPGR). It showed that there were 2 potato genotypes found in Oksibil (KM-O and KP-O) and 5 potato genotypes found in Anggi (KM-A, KH-A, KP-A, KB-A, and KT-A) with quite diverse traits, particularly in tuber traits. Based on the morphological character, it shows the formation of two main clusters with a dissimilarity index of Squared Euclidean Distance ranging from 6.112 to 46,643. Cluster one consisted of genotypes KM-O, KP-O, KM-A, and KH-A, and cluster two consisted of KP-A, KBH-A, and KT-A genotypes. Based on the tuber analysis, the highest moisture content was found in KP-A, and conversely, this genotype produced the lowest dry matter content. The lowest water content of potato tubers with the highest dry matter content was found in KH-A. The highest starch content was in KP-O and KBH-A, the highest reducing sugar content was in KM-A, and the potato genotype with the lowest reducing sugar content was KP-A.

Keywords: Potato, Solanum tuberosum, Papua, Morphology, Nutrition

Noer Nurhayati (BMKG) and Novana Sari (BMKG).

Empowering tacit knowledge toward better climate adaptation.

Abstract. Geographically situated in the heart of tropical region, Indonesia has more than 275 million population whose main professions are farmers and fishermen. Most of these people live in villages and suburban areas and has least opportunity to undertake higher education level; accordingly they just succeed to their parents to perform their jobs based on conventional way and local wisdoms. Nowadays with rapid development of science and technology, some traditions have no longer been solutions for facing extreme events like flash floods, landslides, and high sea waves.

BMKG has several outreach programs namely Weather Ready nation, Climate field school and Weather field school for Fishermen. In this paper we will discuss about three pilot studies each showing the significant results of this community-based program. The objective of this paper is to identify the key success factors of the BMKG public outreach program, and to evaluate the outcome of those three programs based on participants' pretest and post test results. Findings of this study are expected to lead to impactful recommendations for local authorities and decision makers in facilitating the people toward better change climate adaptation

Keywords: Farmers, fishermen, decision makers

Apresus Sinaga (National Research and Innovation Agency), Nicolays Jambang (National Research and Innovation Agency) and Lukman Hakim (National Research and Innovation Agency).

Increased Cocoa Production due to Organic Fertilizer.

Abstract. One way to increase the production of cocoa pods is by applying fertilizer. Fertilization using organic materials is an option for fertilizing cocoa plants. This study aims to determine the magnitude of the increase in cocoa fruit production with the application of organic fertilizer. Lokasi penelitian di Kecamatan Prafi yang merupakan kecamatan yang memiliki kawasan pengembangan tanaman kakao, dilaksanakan pada bulan Januari hingga Desember 2019. The results showed that the application of organic fertilizer to cocoa plants by 10 tons ha-1 could increase the number of cocoa pods by 117.55% against control plants. Selain itu, diperoleh hasil bahwa terdapat korelasi yang kuat antara jumlah biji basah dan jumlah biji kakao kering dengan nilai koefisien 0,98**.

Keywords: organic fertilizer, production, cocoa

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Scenario Seismic Hazard Analysis (SSHA) in Cilegon City for Better Infrastructure Construction Post-Big Earthquake 2019 and 2022.

Abstract. The large earthquake on August 2, 2019, and January 14, 2022, which devastated Banten City, gave an earthquake warning to the surrounding area, including Cilegon City. As an area with several vital infrastructures, such as Merak Port, various chemical and steel industries, and power plants, Cilegon City requires a seismic study that can provide information for the planning and retrofitting building structures. In this study, an earthquake analysis will be carried out using the Scenario Seismic Hazard Analysis (SSHA) for Cilegon City to calculate the acceleration of the bedrock. The earthquake sources modeled include the source of the Semangko Graben Segment and the Sunda Strait Megathrust Segment. From this study, hopefully, we will gain a good insight into the acceleration in the bedrock if an earthquake occurs according to the scenario. The benefits for policymakers and interested parties are infrastructure minimal damage, and fewer casualties affected by the earthquake.

Keywords: Scenario Seismic Hazard Analysis, acceleration, Semangko Graben, Sunda Strait Megathrust

Andi Tenrirawe (Badan Riset dan Inovasi Nasional), Amelia Sebayang (Badan Riset dan Inovasi Nasional), Ayyub Arrahman (Badan Reset dan Inovasi Nasional), Bahtiar Bahtiar (Badan Riset dan Inovasi Nasional (BRIN)) and Yasin Said (Badan Riset dan Inovasi Nasional).

Insect-resistance test of Sitophilus zeamais Motschulsky (Coleoptera: Curculionidae) on several maize hybrid line .

Abstract. Abstract. One of the maize development strategies is to improve the quality of the yield. Yield quality is not only determined by the production process but also determined by the post-harvest process. In the post-harvest process, one of the important elements of storage. One of the efforts to reduce damage to corn in storage is to provide corn varieties that are classified as resistant to Sitophilus zeamais Motschulsky (powderpost beetles) infestation. The use of resistant varieties in controlling warehouse pests of S. zeamais can reduce seed damage during storage, and is very profitable because it is easy to implement by farmers, practical, economical and safe for the environment. Therefore, a research was conducted to screen the germplasm resistance of maize against the attack of the powdery mildew S. zeamais. Maize strain resistance testing against S. zeamais was carried out in 2018 by testing 30 genetic material of corn germplasm then the entry was stored in a freezer for 2 weeks which aims to kill warehouse insect pests from the field. Of the thirty accessions/lines of maize germplasm that were tested for resistance to S. zeamais attack, there were twelve accessions/entries of which showed high resistance, namely accession numbers/lines 48,105,228, 235,237,239,273,285,290,301,342,375. This resilience can be seen in the vulnerability index and the number of F1 progenies S. zeamais produced. The susceptibility index ranged from 0.9 to 3.6 and the number of F1 S. zeamais progeny ranged from 1.5 to 3.5 individuals

Keywords: maize, post-harvest, strategies, Sitophilus zeamais Motschulsky, powderpost, beetles

Ananda Dwi Puspita (Universitas Hasanuddin), Tutik Kuswinanti (Universitas Hasanuddin) and Ade Rosmana (Universitas Hasanuddin).

Analysis of the Severity of Stem Rot Disease in Pamelo Oranges (Citrus maxima) in Pangkep Regency, South Sulawesi.

Abstract. Pamelo (C. maxima) is native to Southeast Asia, and the contribution of South Sulawesi nationally as a producer ranks first at 30.76%. The purpose of this study was to determine the intensity of stem rot disease on pamelo and also to observe external factors such as light intensity, pH, soil organic matter, and crop management which were thought to affect the intensity of stem rot disease at the center of the pamelo plantation in Ma'rang District, Labakkang, and Segeri, Pangkep Regency. After calculating the intensity of disease severity, samples were taken on the symptomatic tissue, then the disease-causing pathogens were isolated and purified, then observed microscopically at the Laboratory of Pest and Plant Diseases, Hasanuddin University. The results showed that the highest stem rot disease intensity was in Ma'rang District on red and white pamelo varieties at 53% and 44%, followed by Labakkang District at 33% red and white pamelo varieties, and the lowest was 26%, in Segeri District on 30% red and 24% on white pamelo varieties. The lowest light intensity was in Ma'rang Subdistrict at 203% and 179%, Labakkang District at 458% and 340%, and Segeri District which amounted to 685% and 679%, respectively. The soil acidity level (pH) at three locations in Pangkep Regency was close to normal, ranging from 6.0-6.5%, while the C-Organic nutrient content in the three sub-districts ranged from 2.4%-2.5%. Nitrogen in the three sub-districts ranged from 0.12% to 0.19%. Pamelo citrus production in Ma'rang District was 92.72 tons/ha, Labakkang 213.51 tons/ha, and Segeri District was 259.40 tons/ha. These data indicate that the intensity of disease attacks and land conditions affect the production of pamelo in the three sub-districts observed.

Keywords: citrus maxima, disease intensity, stem rot disease

Ernawati Djaya (Food Crop Research Center, National Innovation Research Agency), Andi Nasruddin (Food Crop Research Center, National Innovation Research Agency), Melina M (Food Crop Research Center, National Innovation Research Agency), Erwin Najamuddin (Food Crop Research Center, National Innovation Research Agency), Nurasia Djaenuddin (Food Crop Research Center, National Innovation Research Agency) and Aminah A (Department of plant pests and diseases, Faculty of Agriculture, Hasanuddin University).

Detection and Identification of Pylciv Virus Symptoms in Chillies in Makassar, South Sulawesi.

Abstract. Red chili (Capsicum annum L.) is a herbaceous plant with a spicy fruit taste caused by the content of capsaicin. One of the inhibiting factors for chili production is curly yellow disease caused by Pepper Yellow Leafcurl Indonesia Virus (PYLCIV) (Geminiviridae: Begomovirus). Symptoms of this disease are characterized by yellowing of the leaves, curling of the leaves, changes in fruit size, stunted plant growth, reduced number of fruit produced, reduced fruit size, resulting in loss of production up to 80.82%. The yellow curly virus is transmitted by the whitefly vector insect (Bemisia tabaci Genn.). Transmission can occur from the nursery to the field after transplanting. The presence of the PYLCIV virus has not been completely detected in various chili growing centers in Indonesia. Therefore, it is considered necessary to conduct a study to determine the presence of PYLCIV virus in chili plants in Makassar by its vector, Bemisia tabaci. Detection and identification using molecular methods with PCR (Polymerase Chain Reaction),The primers used are PYLCIV DNA A Primer, PYLCIV DNA B Primer and General Primer SPG2. The results of molecular detection and identification using polymerase chain reaction showed positive PYLCIV infection with bands measuring 693 bp DNA A and DNA B measuring 385 bp. Phylogenic analysis showed that Makassar pathogen isolates were closely related to PYLCIV isolates in the Bali area. It can be concluded from the results of this study that PYLCIV was positively detected in Makassar, South Sulawesi.

Keywords: Chili, Detection, Identification, PYLCIV

Happy Widiastuti (Indonesia Oil Palm Research Institute, Unit Bogor), Jajang Supriatna (Austindo Nusantara Jaya (ANJ) Research Center), Salsa Bilah Alzahra (Indonesia Oil Palm Research Institute, Unit Bogor) and Dewi Ismayani Fuad (Indonesia Oil Palm Research Institute, Unit Bogor).

Exploration and Culture of Arbuscular Mycorrhizal Fungi from wild Sago.

Abstract. Sago (Metroxylon sagu Rottb.) is a potential source of carbohydrates. There is a potency to develop of sago in Indonesia since the tropical climate. Arbuscular mycorrhizal fungi (AMF, Glomeromycota) which are known to be able to symbiotically with almost most of the higher plants especially with Sago have not been much reported. The research was conducted to obtain information on the presence of arbuscular mycorrhizal fungi from the rhizosphere of sago palms and to make pure cultures of the dominant species obtained. Exploration was carried out previously by taking samples from the rhizosphere of the wild sago plant planted in shallow peat area in West Papua. The soil bulk density 0,11-0,20 g cm-3 and lower pH (H2O) (4.1). At the initial stage, a trapping culture is made from the rhizosphere soil sample and then a pure culture is made from the dominant spore. Both trapping and pure culture as using telang as host. Based on the morphology spore revealed that they belonged to Acaulosporaceae, Glomeraceae, and Gigasporaceae. The lower abundance and diversity of AMF are possibly caused by abiotic factors, including soil physicochemical properties. However, the species detected in this area might have strong tolerance against acidity and high soil moisture content.

Keywords: arbuscular mycorrhizal fungi, Papua peat soil sago palm, trapping, pure culture

Intani Quarta Lailaty (National Research and Innovation Agency (BRIN)), Yudi Suhendri (National Research and Innovation Agency (BRIN)) and Muhammad Efendi (National Research and Innovation Agency (BRIN)).

Seed Conservation of Begonia spp. from West Sumatra, Indonesia.

Abstract. Begonia collections in Indonesian Botanic Gardens are a source of germplasm for ornamental plants, foods, and future medicinal plants. It is necessary to store collections through seed banks, especially to accommodate collection numbers and genetic variation. Seed exploration activity was focused on the West Sumatra area to increase the representation of Begonia collections at the Indonesian Botanic Gardens's Seed Bank. The purpose of this study was to collect seeds and living collections of the Sumatran Begonia species, mainly from West Sumatra. Beside that, this study aimed to identify the storage characteristics of Begonia seeds in the Seed Bank. The research method was carried out exploratory and investigated in several districts of West Sumatra. From the explorations, we collected 30 species of Begonia from five districts in West Sumatra, namely Solok, Sijunjung, Tanah Datar, Lima Puluh Kota, and West Pasaman. The most common Begonia species were found in Solok Regency (eight species or 25%). We found those Begonias in the vegetative and generative phases. About 75% of the plants found produce flowers. Some plants are producing fruit, both young and ripe. Begonia habitat is generally a humid area, in the form of karst cliffs, caves, streams, forest floors and wet rocks. Plant collections include seeds, living plants, and herbariums. Furthermore, the characteristics of seed storage properties of 30 species of Begonia were carried out based on the type of seeds obtained. Characteristics of plants, types of seeds, and associated plants around Begonia will be described in this paper.

Keywords: Begonia, Ex situ conservation, Seed bank, Seed conservation, West Sumatra

David Oscar Simatupang (Faculty of Agriculture, Musamus University, Merauke,), Didi Rukmana (Faculty of Agriculture, Graduate School, Hasanuddin University Makassar), Alexander Phuk Tjilen (Faculty of Social and Political Sciences, Musamus University, Merauke) and Mahyudin Mahyudin (Faculty of Agriculture, Graduate School, Hasanuddin University Makassar).

The dynamics of oil palm land change and its study of Environmental, Economic and Social impacts in Merauke District.

Abstract. The palm oil industry in the Merauke area has been expanded by national and international industries since 2011, playing a role in national and regional economic growth with an 11.48% increase in CPO production per year, but the palm oil industry has a negative perception but in general the industry also has multiple economic functions, social and environmental.

The research approach uses a dynamic system by describing and simulating complex problems dynamically through the identification of feedback structures with many cases to build an objective model in the form of causal diagrams with systems thinking or causal loop design, so that in a dynamic systems approach collaborating the linkages between dynamic conflicts due to the economic, socio-cultural and ecological impacts of the palm oil industry, in the data analysis technique in the causal loop analysis, the researchers used the PLE Vensim software.

The results of this study show that the conceptual causal loop provides an overview of the impact of the development of the palm oil industry on the economic, social and environmental sectors, on the community there is a change in the pattern of work culture or special production in local communities, changes in infrastructure and access to increase the economic value of the community's area, the government has an impact on increasing investment. the palm oil industry in the Merauke area allows opening of access to new areas and also job opportunities that can prosper the community (Increasing the value of the Merauke HDI), and the industry itself is the increase in demand for CPO encouraging the need to fulfill the supply or availability of FFB to fulfill this. The addition of a workforce to meet the needs of global CPO demand allows job opportunities for the community and the value of investment by local governments

Keywords: Oil Palm Industry, Dynamic System, Multifunctional Impact

Endang Hilmi (MSP FPIK dan Magister Ilmu Lingkungan Unsoed), Nurul Anwar (Fakultas ekonomi dan Magister Ilmu LingkungN Unsoed), Imam Santoso (Fisip dan Magister Ilmu LingkungN Unsoed), Taruna Mona Rachman (Stasiun Tunggul Wulung BMKG Cilacap dan Magister Ilmu Lingkungan Unsoed) and Teguh Wardoyo (Stasiun Tunggul Wulung BMKG Cilacap dan Magister Ilmu Lingkungan Unsoed).

The impact of climate change for the stability of mangrove and estuary of Segara Anakan Lagoon.

Abstract. Segara Anakan has many ecosystems including mangrove and lagoon ecosystem as main ecosystem. The stability and vulnerability of mangrove and lagoon ecosystem are influenced by the potential of climate change. This research aimed to analysis impact of climate change toward stability and vulnerability of mangrove and lagoon ecosystem. The research method used the data 30 years of geometeorology and geophysic and mapping analysis of mangrove and lagoon area. The results showed that (1)The wind blows of west monsoon was dominanted by wind blow Southeast to the Southwest (average speed of 10 to 20 knots), the East season was dominated by wind blows from the southeast with an average speed of 14 to 20 knots, (2) The average rainfall in the last 10 years (2009- 2018) had range > 3,000 mm, (3) the average wave height in the southern coast of Cilacap had ranges from 2.7 m to 3.4 m, (4) ocean currents in the South Indian Ocean of Java in had an average speed of 0.25 to 0.50 m/second (0.5 to 1 knot), (5) Lagoon area from 1157.91 ha (2008) to 821.89 ha (2017), (6) decreasing of crabs catching from 41,943 tons (2008) to 8,880 tons (2017) (7) mangrove ecosystem was dominated by very rare - medium density

Keywords: Segara Anakan Lagoon, climate change impact, mangrove density, crabs catching

Gandi Y.S Purba (Study Program of Marine Science, Universitas Papua), Yunita Insos Eramuri (Study Program of Marine Science, Universitas Papua), Frida. A. Loinenak (Study Program of Marine Science, Universitas Papua) and Marthin Matulessi (Study Program of Marine Science, Universitas Papua).

Coastline Change Using Landsat Image at Manokwari Coastal Area West Papua.

Abstract. Since the city of Manokwari was made the capital of West Papua Province, the population and intensity of development in the coastal area has increased very rapidly, this has resulted in increased pressure on the coastal area. Seeing this condition, research on shoreline changes in this area needs to be done. The purpose of this study was to determine the dynamics of oceanography in the Manokwari Coastal City in 1999, 2014 and 2020, to identify shoreline changes in 1999, 2014 and 2020, and to determine the rate of shoreline change in the Manokwari Coast in the last 15 years and 6 years, i.e in 1999, 2014 and 2020. The method used in this research is the method by utilizing satellite image data from Landsat 7 ETM and Landsat 8 OLI images with the provision of oceanographic data (AVISO) and in situ survey methods. The results of this study indicate a significant change in the coastline, both abrasion and accretion. The range of abrasion from 1999 to 2014 was 3.77 m/year, and from 2014 to 2020 the abrasion was 3.21 m/year. The accretion ranges from 1999 to 2014 was 0.68 m/year, and from 2014 to 2020 the accretion was 3.83 m/year. The result of overlapping from 1999 to 2020 changes in the coastline in this area experienced changes in abrasion of 6.97 m/year and accretion of 4.51 m/year.

Keywords: Coastline change, abrasion, accretion, Manokwari, Landsat

Aplena E. Bless (Pusat Penelitian Lingkungan Hidup Unipa), Thomas F. Pattiasina (Pusat Penelitian Lingkungan Hidup Unipa) and Krisma Lekito (Pusat Penelitian Lingkungan Hidup Unipa).

Mangrove Vegetation Analisis and Carbon Stock in Klawalu Mangrove Park of Sorong West Papua.

Abstract. Mangrove forest ecosystem has a distinctive characteristics, and important ecological functions in coastal areas. The objective of this study is to analyse mangrove vegetation and its carbon stock in Taman Wisata Mangrove Klawalu (TWMK) Sorong. The study area is located at Klawalu Mangrove Park in Sorong Municipality West Papua Province. Analisys of mangrove area and its distribution were conducted using citra seninel 2A, and NDVI to analized the vegetation density. Sampling for identification of mangrove vegetation was carried out using line transect and sample plots. The results showed that mangrove vegetation is spread and cover around the two small rivers. Mangrove area in TWMK and its surrounding is about 144.66 ha, which 47.71% of the area had a very dense vegetation, 24.17% were dense, 16.75% rather dense and about 2.42% had rarely vegetation. Ten species of primary mangrove were found in TWMK and the highest carbon stock was in Rhizophora.

Keywords: Carbon Stok, Mangrove Vegetation, TWMK Sorong

Yeli Sarvina (Nasional Indonesian Agency of Research and Innovation).

ENSO AND CLIMATE VARIABILITY IN PAPUA .

Abstract. The interaction sea-atmosphere in the middle and east equators of the Pacific Ocean identified as El-Nino and Southern Oscillation (ENSO) is one of interannual climate variability in Indonesia. Extremes phase ENSO, EL-Nino, and La-Nina have significant impacts on all sectors including agriculture, Maritim, fishery, healthy, forest fire, transportation, etc. To anticipate ENSO impacts, it is required to identify the impacts of ENSO on climate variability in specific regions. In this study, we analyze the impact of ENSO on rainfall characteristics in several areas in Papua Islands namely Merauke, Jayapura, Manokwari, and Wamena. The result of the analysis reveals that the rainfall characteristics in Merauke, Jayapura, Manokwari, and Wamena are influenced by ENSO with different influences among areas. In General onset of the rainy season is earlier in La Nina years in comparison to the normal year and the onset of the dry season is come in advance in El-Nino years. The annual rainfall in La-Nina year is higher than in normal years and in El-Nino year is lower than in normal years. The anomaly of rainfall as impact ENSO varies differently among areas in Papua.

Keywords: onset, annual rainfall, the rainy season, dry season, La-Nina, El-Nino

Gunawan Wibisono (Universitas Mulawarman) and Mustofa Agung Sardjono (Universitas Mulawarman).

Community Participation in Community-Based Mangrove Management (Case Study in Teluk Semanting, Biduk-Biduk and Teluk Sulaiman, Berau Regency).

Abstract. Nearly 80% of deforestation occurs in other land uses. One way that can be done to prevent deforestation is community-based management, where community participation is important. The purpose of this study was to determine community participation in community-based mangrove management in Teluk Semanting, Biduk-Biduk and Teluk Sulaiman, Berau Regency. This type of research is descriptive with questionnaire and observation data collection methods. While the data sources needed are informants, reports and documents related to research. The measurement of the level of community participation uses four stages of participation, namely: participation in decision making, participation in implementation, participation in the use of results and participation in supervision. Respondents were selected randomly and purposively and determined the segmentation of respondents, namely education level, age, length of stay in the village, income, number of family members, work and activity in institutions. community-based mangrove management. The decision-making stage is worth 1.46, the program implementation stage is worth 1.52, the result utilization stage is 1.63 and the supervision stage is 1.45. In detail, the level of participation in Semanting is 1.71 (low) but at the output utilization stage, participation is moderate, while the other stages are low. Community participation in Biduk-Biduk Village in general has a very low level of participation (1.27), including at all stages of participation. The participation of the people of Teluk Sulaiman in general has a moderate level of participation (1.88). At the stage of participation in the utilization of high status results (2.25). While the decision-making stage has a low level of participation (1.59).

Keywords: Community Participation, Mangrove Management, Berau District

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DNA barcoding and morphological analyses of sea urchin Tripneustes spp. along the Bird's Head Seascape Papua-Indonesia.

Abstract. Tripneustes is a genus of sea urchins containing four species. We used a region of the cytochrome oxidase I (COI) gene for a DNA barcoding approach and identify genetic diversity patterns among 76 individuals of Tripneustes. We also used a morphological approach to measure the characteristics of 104 Tripneustes individuals from five locations in Bird's Head Seascape Papua (BHS)-Indonesia. Tripneustes spp. was identified from comparisons with blast in the GenBank and unpublished sequences in the BOLD system as belonging to T. gratilla, T. ventricosus, and T. kermadecensis. Haplotype diversity was high in all Tripneustes and nucleotide diversity was low for all samples. The fixation index (Fst) values indicated no significant difference in each pairwise combination of these 5 populations except the Yapen with Manokwari and Nabire populations. Results from neighbor-joining tree analysis of the COI sequences of Tripneustes showed that all individual in BHS has close connectivity with each other. The gene flow between BHS populations was high. There was a morphological difference in Tripneustes among 5 study sites in the BHS. The mean test diameter of Tripneustes varied from the smallest in Biak to the largest in Wasior. The maximum test diameter and mean weight of Tripneustes also varied among locations. Tripneustes in BHS generally had a diameter range of 60-80 mm with the highest frequency of 77.5 mm. The test height mostly ranged from 35 to 55mm with the highest frequency of 54 mm. Tripneustes mostly possessed a weight range of 100-300g with the highest frequency of 120g. The spine length ranged from 8 to 11 mm with the highest frequency of 9mm. In general, a number of spines was 500-3000 with the dominant frequencies being 500. As a whole, Manokwari Tripneustes is bigger than Biak, Nabire, Yapen and Wasior Tripneustes.

Keywords: BHS, COI, Tripneustes

I Komang Damar Jaya (University of Mataram), Bambang Budi Santoso (University of Mataram) and Jayaputra Jayaputra (University of Mataram).

Intercropping Red Chili with Leguminous Crops to Improve Crop Diversity and Farmers' Resilience to Climate Change Effects in Dryland.

Abstract. Crop diversification is one of the ways to adapt to climate change effects, especially in dryland. This study aimed to explore the potential benefits of intercropping and determine the best time to sow leguminous crops between the rows of red chili or chili crops. Two leguminous crops, mungbean and groundnut, were intercropped with chili in an arid area of Gumantar, North Lombok, Indonesia. The leguminous seeds were sown five times; at the same time, a week, two weeks, three weeks, and four weeks after transplanting the chili crops. The treatments were arranged factorially in a randomized block design with three replications. The size of each treatment plot was 600 x 100 cm, and the chili crops' spacing was 60 x 60 cm. Three rows of leguminous crops were sown between the rows of chili crops with a spacing of 20 x 20 cm. Monocropping of chili, mungbean and groundnut was also provided in each block to calculate the land equivalent ratio (LER). The results showed that all the intercropping treatments had a LER value of higher than 1.0, indicating the advantage of intercropping over monocropping in terms of land utilization. In addition to improving crop diversity, intercropping also improved the yield of chili and the farmers' return. Based on those results, intercropping chili with leguminous crops can be adopted as one of the strategies to improve dryland farmers' resilience to climate change effects.

Keywords: chili, climate change, diversification, groundnut, mungbean, resilience

Eva Achmad (University of Jambi) and Rince Muryunika (University of Jambi).

ABOVE GROUND CARBON STOCK ESTIMATION BASED ON VEGETATION INDEX CLASSES OF PEATLAND FOREST AREA IN JAMBI PROVINCE.

Abstract. The peat swamp forest ecosystem in Indonesia and especially in Jambi Province has decreased in area and has been damaged. The fact is that forest and land fires (karhutla) always occur on peatlands such as in 1997, 2014, and 2015, and also in 2019 forest and land fires still reoccur in several places, which causes an increase in material and mental losses. KPHP (Forest management unit) Unit XIII Muaro Jambi, as a forest manager at the site level, has a land cover in the form of secondary peat swamp forest and other landcovers. Changes in land use and forest deforestation due to fires are the cause of the release of carbon stores in Indonesia which can lead to climate change. KPHP Unit XIII Muaro Jambi has the potential as a large enough carbon sink. Given the area that reaches 107,839 hectares and has a type of peat soil that is rich in carbon content and is a conservation area, it is necessary to analyze carbon stocks in this forest area. Estimation of carbon stocks above ground level with non-destructive methods can be carried out using remote sensing technology by connecting the results of measurements in the field. Calculation of carbon stocks in the field using allometric equations. The variables measured in this study were carbon stocks in sapling, pole, and tree stages. The data taken include data on diameter at breast height (DBH). The results showed that number of carbon stocks in 2022 in the sample plot based on the vegetation index (NDVI) class in KPHP Unit XIII Muaro Jambi from field measurements as as follows: for sparse density class, the average carbon is 7.94 tons/ha, and for the medium density class is 35.60 tons/ha. The last NDVI class, for the high density class, the carbon content is 76.03 tons/ha.

Keywords: NDVI, Carbon Stock, Climate Change, Peat Swamp forest, Forest Management Unit

Francina Kesaulija (University of Papua), Marlon Aipassa (University of Mulawarman) and Muhammad Sumaryono (University of Mulawarman).

Land Use and Land Cover Change In Manokwari, West Papua Province .

Abstract. Land cover or land use change modeling is important for decision-makers in optimum land management and planning. The increasing number of residents and the pattern of regional spatial use have resulted in an increase in the need for land So that the clearing of forest areas that are carried out continuously will have an impact on deforestation and forest degradation. This research was conducted in Manokwari, West Papua Province. The purpose of this study was to determine the extent of forest land change due to planned and unplanned deforestation and forest degradation as a development activity through land cover dynamics using satellite imagery data. Three satellite images, dating from 2006, 20013, and 2017, were used as main data for land cover classification based on a supervised classification approach. This study used a descriptive method with an analysis of land cover changes using an overlay technique to determine the deforested and degraded areas. Ground check uses the Purposive method for as many as 30 sample points. The results showed the change in land cover that occurred during the period 2006-2017 is dominated by reducing of forested land and becoming settlement and plantation area The total area of deforestation for the last 10 years is 23,633.01 ha, where the deforestation area from planned deforestation was 11.490,88 ha and unplanned deforestation was 12.142,13 ha Meanwhile, the total area of degradation for the last 10 years is 21,799.93 ha. From the area of deforestation, planned deforestation was 211,32 ha and unplanned deforestation was 21.588,62 ha. The integration spatial modeling can be used to construct a spatial prediction of land cover change in 2017-2025. The land use prediction in 2025 was a reduction of the dry land forested area by about 9,1% while plantation and settlement were increased by about 4,5% and 2,0% respectively.

Keywords: deforestation, land cover, modelling

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Improved Hatching Success of Protected Leatherback Nests at the Jeen Womom Coastal Park, Tambrauw, West Papua.

Abstract. The Jeen Womom Coastal Park includes the most important nesting beaches for the critically endangered Pacific leatherback turtles (Dermochelys coriacea). The Coastal Park includes Jeen Yessa (formerly known as Jamursba Medi; 18 km) and Jeen Syuab (formerly Wermon; 6 km), which host over 3700 marine turtle nests every year. Over 60% of them are leatherback nests. Batu Rumah is one of three nesting beaches of Jeen Yessa, and primary threats to marine turtle nests at Batu Rumah are predation by pigs, monitor lizards and dogs, and high sand temperatures. Temperature loggers placed at leatherback nest depth (70-75cm) recorded Batu Rumah sand temperatures ranging between 30 - 34°C. To improve the hatching success of leatherback nests at Batu Rumah during the April-September 2022 nesting season, we protected nests by: 1) building an enclosure around each nest, 2) shading with one layer of Cycas sp. leaves and building enclosure around each nest, 3) shading with two layers of Cycas sp. leaves and building enclosure around each nest. To examine how effective these nest protection methods are, we compared the hatching success of each nest protection method to control nests (no treatment). We evaluated hatching success several days after nests had hatched or had exceeded 70 days of incubation, and data were analyzed using one-way ANOVA. In general, protected nests have greater hatching success than control. In addition, nests with shading (one and two layers) have better hatching success than non-shaded nests. We concluded that shading is the most effective method to improve the hatching success of leatherback nests at Batu Rumah and, when applied widely, will help maximize hatchling production.

Keywords: Dermochelys coriacea, hatching success, nest protection

Muhammad Izza (Universitas Padjadjaran), Sri Astuty (Universitas Padjadjaran), Rizky Ramadhan (Universitas Padjadjaran), Namira Perdani (Universitas Padjadjaran), Mata Anwar (Universitas Trunojoyo Madura), Nova Rosdeawati (Universitas Trunojoyo Madura), Muhamad Firdaus (Universitas Padjadjaran) and Erma Yullihastin (Pusat Riset Iklim dan Atmosfer Badan Riset dan Inovasi Nasional).

Identification of temperature change related to frost phenomenon over Jayapura, Indonesia.

Abstract. The frost phenomenon that occurred over Jayapura, Indonesia, in July 2022 was the worst frost in the last two decades (1998 – 2022). The frost impact destroyed agricultural fields, crippling most of the crops, and caused famishing to hundreds of people. Considering that Jayapura has the largest agriculture field in Papua, an assessment related to possible mechanisms that caused this extreme event is needed for disaster mitigation. On the other hand, numerous previous studies investigated the relationship between frost and climate change. However, it is still poorly understood, particularly in the Papua study case. This study explores the linkage between the frost phenomenon and climate change in Jayapura, Papua. Hence, we conducted an analysis using station observation and reanalysis datasets. In addition, we also assess spatial analysis to determine the distribution of weather pattern anomalies derived from The European Center for Medium-Range Weather Forecast (ECMWF) – ERA5 datasets during extreme episodes. We found that maximum and average temperatures have increased over the last decade (2002-2022). It is also noted that the frost event may be related to temperature change in Jayapura, Papua. It is also important to note that frost event seems to occur frequently in the future.

Keywords: Frost, Climate Change, Temperature, Jayapura

Iwan Gunawan Tejakusuma (Badan Riset dan Inovasi Nasional (BRIN)), Euthalia Hanggari Sittadewi (Badan Riset dan Inovasi Nasional (BRIN)) and Rizki Fitriani (Badan Riset dan Inovasi Nasional (BRIN)).

Hydrometeorological Hazard Detection and Warning for Risk Reduction in West Java, Indonesia.

Abstract. Climate change-related disasters are becoming more frequent in Indonesia. Hydrometeorological disasters, in particular, have increased over the last decade, accounting for more than 90% of Indonesia's natural disasters. The disasters caused significant damage, resulting in loss of life, biodiversity, infrastructure, property, and the environment. Mitigating the hydrometeorological hazards is therefore needed to reduce the risk of disaster. The research was carried out in West Java province, specifically at Sukakerti Village, Cisalak Sub-District, Subang District, and at Tugumukti Village, Cisarua Sub-District, West Bandung District, with the aim of assessing physical conditions and designing hydrometeorological disaster early warning for community preparedness. Sukakerti Village has winding primary and secondary forest morphological characteristics with a V-shaped river valley type. Flash floods are preceded by landslides caused by rainfall. Tugumukti Village is characterized by undulating hills. This village turns out to be right on a small river that ends at Mount Burangrang. The river that caused the flash floods is only a few tens of meters wide, but the settlement population has grown all around it. Furthermore, agricultural drought occurs during the dry season, disrupting agricultural activities. As a result, the designed instrumentation covers landslides, flash floods, and agricultural droughts. Hydrometeorological hazard detection and warning design instrumentation calls for field devices and routers to communicate via radio to a remote data center. The field device will include sensors for humidity, temperature, solar radiation, wind speed and direction, rainfall, soil moisture, slope, and ground vibration. The router has a speaker to alert the public of a potential disaster. It is expected that the hydrometeorological disaster early warning could alert the public and have a quick response to the information that is notified, thereby minimizing the disaster's impacts. In terms of cost, operation, and maintenance, this technology is more advantageous than GSM and satellite telecommunication.

Keywords: hydrometeorological disaster, early warning, wireless sensor network, community preparedness

Yuanike Kaber (Faculty of Fisheries and Marine Science, University of Papua), Anjeli S. Paisey (Faculty of Fisheries and Marine Science, University of Papua), Sarah Wa Ode Usman (Faculty of Economic and Business, University of Papua) and Philiphus Musyeri (Faculty of Fisheries and Marine Science, University of Papua).

THE DEVELOPMENT OF SUSTAINABLE LIVELIHOOD BASED ON COMPARATIVE ASSESSMENT AREAS AND THE CULTURE OF LOCAL COMMUNITY IN BLUE ACTION FUND PROJECT AREAS: CASE STUDIES IN THE NORTH OF MISOOL MARINE PROTECTED AREAS IN RAJA AMPAT, THE WEST OF PAPUA PROVINCE .

Abstract. This research assessment based on survey to find out the comprehensive development of alternative livelihoods preform of comparative advantages sustainable regional and local culture community, in the work area project of Blue Action Fund (BAF). The objectives of this research consists of (1) to identified the potential alternative livelihood based on the comparative advantages, and social studies, (2) to mapping the potential alternative livelihood based on the comparative of regional advantages and (3) to formulate the recommendations plans and design the follow up alternative livelihood development activities based on the study comparative advantages, social culture and local institutions in the North of Misool Marine Protected Area, Raja Ampat, the West Papua Province. The research sampling areas consist of 5 villages, there are Atkari, Solal, Salafen, Waigama and Aduwei, Based on the research shows the potential alternative livelihood based on superior sectors could be divisible into 3 (three), cluster namely the fisheries sector, agriculture and forestry, and the tourism sector. The development of alternative livelihood in fishery sector can be focused on the management of fisheries with environmentally friendly concept, optimize the fisheries management of anchovies and squid, and the initiation of sustainable development of the activities of the marine culture through introduction of technological innovation is appropriate and environmentally concepts.

Keywords: Sustainable livelihood, comparative assessment, the culture of local community, Blue Action Fund Project Areas, the North of Misool Marine Protected Areas, the West Papua Province

Radios Simanjuntak (University of Halmahera).

Community conservation Economy ecotourism social forestry.

Abstract. Talaga Paca Village used to be a community resettlement village from the remote indigenous community o hongana ma nyawa or Tugutil in North Halmahera Regency, North Maluku Province. This village is located on the edge of a lake covering an area of ± 200 ha and is directly adjacent to a forest area with high vegetation density and biodiversity. As many as 75% of households in Talaga Paca are classified as poor which is influenced by the low level of education. In 2019, the Ministry of Environment and Forestry gave approval for the management of a forest area of 865 ha for 35 years in the scheme of village forest to Talaga Paca Village as part of the Social Forestry program to improve community welfare while ensuring the sustainability of the existing natural ecosystem. Through the mentoring, the community is committed to develop ecotourism to improve the level of community welfare on the one hand, and on the other hand ensuring the preservation of the natural and cultural resources they have. Exploration of biodiversity and ecotourism potential was carried out by the Halmahera University Team with the Community, Indonesian Birds and Generation Pesona Indonesia (GenPI) North Maluku. There are 37 species of birds were identified, some of which are endemic and protected. Jungle tracking and bird watching through the village forest of Talaga Paca as well as the ecotourism attractions that have attracted a number of tourists to visit. Currently, the people of Talaga Paca have begun to feel the economic benefits of the presence of tourists.

Keywords: Community, conservation, economy, ecotourism, social forestry

Nurdiana Abbas (Khairun University), Firlawanti Lestari Baguna (Khairun university), Aqshan Shadikin Nurdin (Khairun University) and Fadila Tamnge (Khairun University).

Bird Diversity of Resort of Akejawi in Aketajawe Lolobata National Park.

Abstract. Research on richness and bird species diversity are important for conservation efforts in National Park. According to Birdlife International (2008) that forest is the most significant habitat for bird because it can provides food sources and homes for abundant bird life. Therefore, the need to study the current bird diversity and status of bird species as a basis for future monitoring and implementation of appropriate conservation measures are important. Observation plots are placed in primary habitat and secondary forest. Total observation point is 20 plots. The method was used by point count. The distance between observation plot is 200 m and the radius of observation is 50 m. The observation were made in the morning (06.00-09.00) and evening (15.00-18.00). Data was analyzed by using Shannon-Wiener Index Diversity. Based on research, There is 345 individuals of 37 species of bird in Akejawi Resort. Secondary habitat has the highest diversity index (H'=3.12; E = 0.88; R = 6.74) when compared to primary habitat (H' = 2.99; E = 0.88, R = 5.67). This study shows that 9 birds species are Endemic of North Maluku and 15 species are protected by laws and government regulations.

Keywords: Bird, Diversity, Aketajawe Lolobata National Park

Aldi Padila (University of Papua), Charly Wanggai (University of Papua), Francina Kesaulija (University of Papua) and Bernadetta Sadsoeitoeboen (University of Papua).

THE AREA OF FLOOD RUNOFF IN THE RIVER BRANCH DUA, MANOKWARI REGENCY, WEST PAPUA PROVINCE WITH HEC-RAS MODELING.

Abstract. Wosi watershed is one of the watersheds in Manokwari Regency, West Papua which is included in the classification of Restored carrying capacity which is indicated to have decreased hydrological function. The research, which was conducted for 3 months, aims to determine the area of the planned flood discharge/peak runoff (m3/s) and the area affected by the flood (ha) in the Wosi Cabang Two River. Estimation using HEC-RAS which is a river flow modeling used to predict the area of flood runoff. The input parameters needed by HEC-RAS are rainfall data (from the BMKG at Rendani Manokwari Station), River Geometry (using imagery), topography and land cover data (DEM), data on the general condition of the Branch Dua River. The design flood discharge data is calculated using the rational method Q=0.00278*C*I*A. The research data were analyzed descriptively quantitatively with interpretation and map analysis techniques. The results showed that the planned flood discharge values for 2, 5, 10, 25, 50, 100 years in a row were 89.05 m3/s, 118.50 m3/s, 128.46 m3/s, 135.01 m3 /s, 137.57 m3/s, and 138.94 m3/s. The results of the hydraulic analysis in this study indicate that the Branch Dua River will not be able to accommodate the discharge of this value and will cause flooding in every return period (2-100 years) with an area of 13.88 ha, 14.36 ha, 14,52 ha 14.60 ha, 14.67 ha, and 14.71 ha respectively. The results of the land cover map overlay and HEC-RAS analysis show that flooding in the Cabang Dua river will only occur on a residential land cover with an altitude of 0-12.5 m asl.

Keywords: flooding, HEC_RAS, land cover

Messalina L Salampessy (Post Graduate IPB University, Campus Darmaga Bogor, Indonesia), Ina Lidiawati (Faculty of Forestry, Nusa Bangsa University Bogor Indonesia) and Elfis Metkono (Faculty of Forestry, Nusa Bangsa University Bogor Indonesia).

Local Institutional Failures of Coastal Communities in an Effort to Conserve Mangroves .

Abstract. Mangroves provide important ecosystem services for the community and the surrounding ecosystem. Communities play an important role in efforts to manage their potential and conservation. However, mangrove conditions tend to degrade due to the behavior of the surrounding community. It is important to know the role of local community institutions in mangrove forest management. This article aims to identify and analyze community institutions in the management of mangrove forests in coastal areas. The research was conducted in the village of Pantai Bahagia Muara Gembong Bekasi Indonesia. Data collection was carried out through observation, and interviews with a number of key informants. The data were analyzed using the SSBP approach method, namely the situation, structure, behavior, and performance. From the results of the study: The situation shows the increasing destruction of mangrove forests due to increasing population growth and the increase in land conversion as rice fields and ponds, the structure depicts the community does not yet have formal norms and rules that help manage community activities in the utilization of the potential and conservation of mangrove forests, Behavior describes the existence of various interests from the community and parties in the utilization of mangrove forest potential, the low public knowledge of the role and function of mangrove forests and the absence of coordination and cooperation with parties in forest management and performance shows that weak community institutions and coordination with parties so that mangrove forest destruction continues to occur and has implications for frequent tidal floods, disruption of economic activities and public health.

Keywords: behavior, institutions, mangroves, situation

Katarina Hegemur (Department of Agricultural Product Technology, Faculty of Agricultural Technology, Papua University), Zita Letviany Sarungallo (Department of Agricultural Product Technology, Faculty of Agricultural Technology, Papua University), Abadi Djading (Department of Agricultural Product Technology, Faculty of Agricultural Technology, Papua University), Cicilia Maria Erna Susanti (Faculty of Forestry, Papua University), Nurhaidah Iriyany Sinaga (Faculty of Forestry, Papua University) and Diana Nurini Irbayanti (Department of Agribusiness, Faculty of Agriculture, Papua University).

Diversity of Pandan Tikar (Pandanus tectorius Park.) Fruit that Cultvated in Papua and West Papua Province Based On Physical Characteristics and Nutritional Content.

Abstract. The Pandan Tikar (Pandanus tectorius Park.) plant has a very wide distribution area in the world, including in Papua, which can be processed into various food products, but information on the physical properties and nutritional content of the fruit is limited. This study aims to study the diversity of 6 types of Pandan Tikar fruits from Papua and West Papua province based on their physical characteristics and nutritional content. The method used in this study is an exploration method with observations in the growing location and Laboratory. The six types of fruits namely Mansinam (P1), Mansinam (P2), Pasir Putih (P3), Aboretum Fahutan (P4), Hamadi (P5), and Kampung Wardo (P6). The results of this study indicate that the six types of Pandan Tikar observed have varied shapes, namely ovoid or egg-shaped (P1 and P2), ellipsoidal (P3), sub-globose or slightly round (P4 and P6), and globose or round (P5); with color variations in the fruit flesh (edible part) namely yellow (P1, P2, P3 and P4), orange (P5), and red (P6). The dimensions of the fruit size vary, the weight of the whole fruit is 1.8-6.0 kg, the length is 19.0-23.3 and the width is 15.0-25.3 cm, with fruit circumference size 56-80.5 cm; so that the size and fruit circle of 6 types of fruit P3 and P4 can be categorized as large fruit. The total weight of the palange is 1.6-5.75 kg/fruit with a total of 45-152 palange/fruit, the width and weight of the palange are 3.2-4.5 cm and 24.8-53.8 g/fruit, respectively; while the weight of the edible parts 6-21 g/palange, and the percentage of edible part 28.0-39.4%/fruit. Total dissolved solids (TSD) ranged from 3.3-7.2 °Brix and vitamin C ranged from 4.8-44.1 ml/100g.

Keywords: Pandan Tikar (Pandanus tectorius P.) fruit, physical properties, nutritional content, diversity

Hendri H (Universitas Papua), Soetjipto Moeljono (Universitas Papua) and Moholine Tumana (Universitas Papua).

Potential Carbon Stock and Environmental Services in IUPHHK-HA PT Cenderawasih Hijau Letari, Kaimana Rregency, West Papua.

Abstract. Efforts to utilize natural resources are still constrained by activities that do not pay attention to the principles of sustainable environmental development, resulting in forest degradation and deforestation which ultimately damage the environment. Various environmental disasters occur due to forest destruction including floods, landslides, global warming and further impacts on health. Thus, the role of tropical forests as a controller of environmental change is very important, including as one of the mainstay sectors in efforts to reduce the rate of emission (emitter) or the rate of carbon sequestration (removal) in an effort to meet the target of Nationally Determinant Contribution (NDC) in West Papua with a decrease of 29%. Greenhouse Gas (GHG) emissions from own efforts and 41% from international assistance. One of the environmental service activities that are currently the main focus is the provision of ecosystem services from the diversity of endemic and distinctive species and the calculation of carbon potential in the absorption of GHG emissions. The allometric equation was used for carbon stock analysis from purposive sampling conducted at PT Cendrawasih Hijau. The results showed that the carbon potential from the aboveground biomass (AGB) and the belowground biomass (BGB) was 430 tons C/ha and 150 tons C/ha, respectively.

Keywords: carbon stock, NDC, ABG, BGB, sustainable

Nicolaus L. Leftungan (Environmental Study Postgraduate Studies University of Papua), Wahyudi Wahyudi (University of Papua), Jonni Marwa (Universty of Papua) and Obed N. Lense (University of Papua).

Mapping mangrove based products to support small entepreneurship activities for indigenous communities at Bintuni bay West Papua Province.

Abstract. Bintuni bay district is one of thirteen districs in West Papua Province and has the largest mangove areas in this province compared to the others. Majority mangrove resources at this district is primary forest, and has been officially declared as National Park dan conservation area. Massive development in Bintuni bay district for land convertion, agriculture expansion, human resettlement, oil-gas explorataion, and other local and central government programs lead to the disturbance of this fragile resources and ecosystem. Local communities are heavily relied on and highly dependend on mangrove resources for their dailly necessities of foods, income generation, shelter, and sources of many intangible goods. In order to optimiizing the sustainable utilization as well as conservation and mangrove protection conducted by the local and indigenous communities, mapping on any feasible and derivative products from mangrove are highly recommended and needed. This research is designed to identify and mapping various feasible mangrove based products developed using small enterpreneurship scheme for local communities at Bintuni bay district. The results indicated that mangrove based products could be derived from their leave, fruits, barks, branches, trunk, and roots. Mangrove forest services provide various prespective from ecotourism, ecoeducation, educational parks, sanctuary, and mangroce research centre. Mangrove ecosystem could be managed to develop many fishery products of crab, shrims and others.

Keywords: mangrove based products, small enterpreneurship, indigenous communities, Bintuni bay

Endang Hariningsih (Department of Management, Sekolah Tinggi Ilmu Bisnis Kumala Nusa) and Rintar Agus Simatupang (Department of Management, Universitas Papua, Manokwari).

A Study on Use Behavior : Extended Theory of Planned Behavior Perspective.

Abstract. The current study aims to investigate what drives individuals to consume green products – Indonesia. To find out this goal, several relationships were tested and verified between attitudes towards green products, subjective norms, perceived behavioral control, behavioral intentions, and usage behavior. Samples were taken on consumers who have knowledge and consume green products in Indonesia. The sampling method uses non-probability with several criteria that must be met by respondents using purposive sampling technique. Structural equation modeling with Warp-PLS 6.0 was used to analyze the data. 652 questionnaires were distributed and 500 vaccines were for analysis. The statistical output shows the findings that all the proposed hypotheses are accepted. The mediating variable strengthens the relationship between the antecedents and consequences of the model. In addition, the research findings contribute and offer new insights in managing the behavior of green product users.

Keywords: attitude toward green product, subjective norm, Perceived Behavioural Control, behavioral intention, use behavior

Tutik Kuswinanti (Plant Protection Study Program, Hasanuddin University), Baharuddin Patandjengi (Plant Protection Study Program, Hasanuddin University), Nur Amin (Plant Protection Study Program, Hasanuddin University) and Mustika Tuwo (Departement of Biology, Faculty of Natural Science).

Population Race Structures of Pyricularia oryzae Cavara in South Sulawesi.

Abstract. Blast disease caused by Pyricularia oryzae is one of the major rice diseases constraining rice productivity in Indonesia. The emergence of new races of the fungus, which became adaptive to the wetland, was suggested caused by the high rate of N fertilizer and the non-resistance varieties used by farmers. Yield reduction due to the disease can reach up to 90 %.

This study aimed to obtain the distribution of the Pyricularia oryzae races in several regencies in South Sulawesi. Determination of the P. oryzae races was conducted in Green House, using 1 set of rice differential varieties consisting of Asahan, Cisokan, IR 64, Krueng Aceh, Cisadane, Cisanggarung, and Kencana Bali. A total of 72 P. oryzae isolates from Maros, Gowa, Bone, and Pinrang Regency were tested on differential rice varieties. The disease intensity was observed seven days after inoculation using the IRRI evaluation standard.

Based on the reactions of differential rice varieties, there were a total of 24 races compositions of P. oryzae found. Race 001 was dominant between isolates from Pinrang and Maros, whereas race 020 was dominant in Bone and Gowa.

Keywords: Blast disease, races, differential varieties

Betty Sahetapy (Pattimura University), Johanna Audrey Leatemia (Pattimura University), Esther Dolfina Masauna (Pattimura University) and Tryani J.K. Lumbantoruan (Pattimura University).

Utilization of Methyl Eugenol Bait Traps on Fruit Flies (Bactrocera spp) (Diptera: Tephritidae) Caught in Fruit Dusung on Ambon Island .

Abstract. Fruit fly (Bactrocera spp.) is one of the most detrimental pests in the cultivation of fruit crops because it attacks fruit produced by plants. Methyl eugenol is an insect attractant compound, especially for male fruit flies. This study aims to determine the number of fruit flies caught in methyl eugenol bait traps carried out on fruit dusung in four villages on Ambon island. In each village, 1 fruit dusung was taken and 5 observation plots sized 20 m × 10 m were used. Bait traps using methyl eugenol on cotton were placed in a 550 ml plastic bottle. Two bait traps were placed in each observation plot. Fruits flies was collected after 6 days then count and identified in the laboratory. The results showed that three species of fruit flies were caught, namely B. dorsalis, B. umbrosa, and B. carambolae. The number of fruit flies caught in Suli, Hutumuri, Allang and Soya Villages were 324, 193, 146 and 88 individual respectively. The highest number of fruit flies caught (306) was B. carambolae in Suli villages.

Keywords: fruit fly, bait traps, methyl eugenol, dusung

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Selected Non-Timber Forest Product Commodity for Future Green Economy Based Products Development in Papua provinve.

Abstract. Non-timber forest products play significant roles on daily livelihood of the forest communities dependence, local forest management practices, and forest resoruces sustainability. These non-timber forest products are major ecosystem constituents of the Papua tropical rain forest and their roles on forest sustainability and supporting the livelihood of the local communities are recently dominated topics anywhere. Papua province tropical rain forest has lying from the mangrove to the highland forest with richness biodiversity in Non-Timber Forest Products. Harvesting these forest products are less destructive in comparison to the timber extraction, and directly contributed to the dailly incomes, irregular jobs, and source of main staple food, and natural ingredients to the local communities. Future forest resources utilization, regulation, policy and management are shifting sharply from the timber to the Non-timber forest products orientation, including carbon sequestration, forest services, ecotourism and the others, which are ackowledged as green economy based forest products. This research is designed to identify, characterize, and examine the roles of Non-timber Forest products to local communities at Papua province to be nominated and developed as green economy based commodities in Papua. Document analysis, literature review and an interview to the selected respondents are conducted to collect the data. Nine Forest Management Unit across Papua Province will be selected as targeted research areas. The results indicated that 21 Non-timber forest products based commodities were identified, and could be developed and promoted as green economy based products. There are ranging from essential oils, gaharu, Noken, mangrove derivated products, honey, coffee, flavours (Masohi), Sago, Ginger based products, ecotourism, palm peanuts, cacoa, fish based products, sea weed, and other. Each FMU has candidature products commoditied to be developed as green economy products, and the future development program are highly needed to be formulated.

Keywords: Non-timber forest products, Green Economy based products, local community, development, and Papua

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SOCIAL FORESTRY BASED CONSERVATION THROUGH ECO-TOURISM IN THE VILLAGE FOREST OF TALAGA PACA, NORTH HALMAHERA REGENCY.

Abstract. Talaga Paca Village used to be a community resettlement village from the remote indigenous community o hongana ma nyawa or Tugutil in North Halmahera Regency, North Maluku Province. This village is located on the edge of a lake covering an area of ± 200 ha and is directly adjacent to a forest area with high vegetation density and biodiversity. As many as 75% of households in Talaga Paca are classified as poor which is influenced by the low level of education. In 2019, the Ministry of Environment and Forestry gave approval for the management of a forest area of 865 ha for 35 years in the scheme of village forest to Talaga Paca Village as part of the Social Forestry program to improve community welfare while ensuring the sustainability of the existing natural ecosystem. Through the mentoring, the community is committed to develop ecotourism to improve the level of community welfare on the one hand, and on the other hand ensuring the preservation of the natural and cultural resources they have. Exploration of biodiversity and ecotourism potential was carried out by the Halmahera University Team with the Community, Indonesian Birds and Generation Pesona Indonesia (GenPI) North Maluku. There are 37 species of birds were identified, some of which are endemic and protected. Jungle tracking and bird watching through the village forest of Talaga Paca as well as the ecotourism attractions that have attracted a number of tourists to visit. Currently, the people of Talaga Paca have begun to feel the economic benefits of the presence of tourists.

Keywords: Community, conservation, economy, ecotourism, social forestry

Local Wisdom in Conserving Endemic and Endangered Tree Species of Magnolia sulawesiana in Sulawesi, Indonesia.

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ABSTRACT

One endemic tree species threatened with extinction in Sulawesi is *Magnolia sulawesiana* (Magnoliaceae). *M. sulawesiana* is distributed in the central and northern parts of the islands of Sulawesi, Indonesia. This species is one of the most exploited tree species for various purposes such as; home construction materials, furniture, musical instruments, sports equipment, etc. The high demand for this type of wood has led to over-exploitation. The natural population of *M. sulawesiana* in Sulawesi's forest was rare. In the Northern part of Sulawesi, *M. sulawesiana* is known with the local name of Cempaka wasian or wasian. One of the conservation strategies to preserve the endemic species in North Sulawesi is to support the local wisdom of the community in the agroforestry of Cempaka wasian (*M. sulawesiana*) for conservation and sustainable use purposes.

Key words: ***Local wisdom, endemic, endangered, Magnolia sulawesiana***

The Birds Composition as an Environmental Quality Indicator in Wallacea's Urban Area

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ABSTRACT

North Sulawesi Province, part of Wallacea Bioregion, has a complex ecosystem, from coastal to mountains, not only lands but also several small islands surrounding the main island. This ecosystem complexity results in high biodiversity for terrestrial species and their marine biota. Advanced urban developments bring various impacts, such as an increase in population rate, land cover, and environmental quality change. The Bird Community Index (BCI) method has established an ecological quality assessment approach employing birds. This index has been applied to the number of green open areas in various cities in Indonesia. Birds are considered wildlife that can occupy broad hollow habitats, including urban ecosystems. Birds' existence around humans can provide advantages, for instance, assisting the process of plant pollination, seed disseminators, controlling pest and insect populations, and indicators of environmental quality. This study aimed to determine the bird species composition in four different ecosystems and assess environmental quality using the Bird Community Index (BCI)**.** This study was carried out by gathering data on bird species in Manado bay, Tumpa mountain, the farming and agricultural area, and the Klabat mountain area. We used field observation through Point count methods as primary data (the farming and agricultural area and Klabat Mountain area) and data from previous publications as secondary data (Manado bay and Tumpa Mountain). Data were analyzed using Bird Community Index and Sorenson index. This study showed that the four ecosystems indicate that birds' quantities and compositions are moderately varied. We listed 37 bird species in Manado Bay, 33 in Tumpa mountain, 36 in farming and agricultural land, and 50 in the Klabat mountain area. The Bird Community Index (BCI) accumulation stems show index quality of 56 – 68.4 and are categorized as medium environmental quality. Sorensen's community similarity index shows a value of 30.3- 51%, classified as low to medium community similarity in four locations.

Keywords : Birds, urban area, wallacea, composition, Bird Community Index


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