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## **Abstracts Received**

# **M – Z**

## **Pest Preference on Sweet Corn (*Zea mays Saccharata Sturt*) on Peat Which Have Been Given Organic Matter, Cattle Manure and Lime**

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### **Abstract**

Research on “pest preference on sweet corn on peat which have been given organic matter cattle manure and lime” carried out in Palangka Raya University from May to July 2004. The aim of the study to find out the effect of organic matter, cattle manure, lime and its combination on pest preference and pest attack intensity on sweet corn.

Completely Randomised Design was used in this study. Treatment of this study are Po = control; P1= cattle manure; P2= organic matter; P3= Lime; P4= cattle manure and organic matter; P5= cattle manure and lime; P6= organic matter and lime; P7= cattle manure, organic matter and lime. Cattle manure= 20 ton/ha; Organic matter= 20 ton/ha; Lime= 10 ton/ha. Tree replications are made for each treatment. DMRT are used for test among treatment at 5 % level.

Result of the study indicated that each phase of growth of sweet corn, there are some pest in several treatment with low attack intensity. For example; phase 7 – 14 dap (day after planting) there are Rice Seedling Flies *Atherigona exigua* (Stein) (Diptera: Muscidae). There is not significant different among treatment on pest attack intensity. During vegetative phase (7 – 42 dap there are several pest: Paddy Swarming Caterpillar *Spodoptera mauritia* (Boisd)(Lepidoptera: Noctuidae); Oriental Migratory Locust *Locusta migratoria* (Meyen) (Orthoptera: Acrididae); dan Maize Borer *Ostrinia furnacalis* (Guen) (Lepidoptera: Pyraustidae). During generative phase (43 – 70 dap): there is pest, Corn earworm *Helicoverpa armigera* (Hbn) (Lepidoptera: Noctuidae).

**Keywords:** pest preference, pest attack intensity, peat soil.

Poster presentation

## **Efficiency of Sawdust for the Reduction in Formation and Evaporation of Ammonia**

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### **Abstract**

Ability of the sawdust matrix for the reduction of ammonia formation in the matrix and of ammonia evaporation from the matrix was examined. It was clarified that sawdust contributes the reduction of ammonia formation and the trap of ammonia in the matrix at the initial stage of the operation of bi-toilet.

The ratio of the excretion and sawdust for the reduction of ammonia evaporation less than 20 ppm was examined. It was clarified that the critical ratio of the excretion and sawdust is 1:80 (g/ml) at the initial stage.

The air currency is an important factor for the odor free bio-toilet. The loss of N as ammonia gas from the bio-toilet during long operation is inevitable. The trial of the recovery of the ammonia will be discussed.

# **Integrated Landuses of Wetland in Hulu Sungai Utara District, South Kalimantan**

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## **Abstract**

Wetland is an unique ecosystem, so that the carrying capacity of the wetland is also specific. Development of wetland has been intensified since the year 70<sup>th</sup>, however those efforts have a little success, even produce many environmental problems. However since long time ago the Banjarese people of South Kalimantan have been familiar with the sustainable management of wetland. They use the wetland for many activities to develop their economic development.

The study was focussed in the wetland area of the Hulu Sungai Utara District, South Kalimantan, especially in the integrated landuses to do many agriculture activities. The results indicate that the Banjarese people in the studied area use the wetland area for development of water buffalo breeding, duck breeding and poultry processing, rice and vegetable area and fresh water fish breeding and fish products processing. All those activities have been done in traditional manner and using indigeneous technologies.

**Key words:** wetland ecosystem, integrated landuses, indigeneous technologies.

## Ecological Purification System to Make Safe Drinking Water by Slow Sand Filtration System in Bangladesh.

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### Abstract

It is famous that the tube well water is contaminated by arsenate in the delta region in Bangladesh. The water from a shallow well is contaminated by arsenate. However, the water from a deep well, in pond and river is safe level of arsenate concentration.

Members of Asia Arsenic Network (AAN) and Miyazaki University in Japan researched in Jessore district in this country. They found serious contamination of arsenate in the tube well water. They made several deep wells, dug wells, and slow sand filter plants. Slow sand filter plant is made for reduction of arsenate and germ cell. These slow sand filter plants in this area were build on the stand point of physical and chemical process by AAN.

The first author (Nakamoto) found that the biological community did not work well in these plants. Nakamoto advised them about the real basic principle of slow sand filtration system. Algal and animal activities are essential for purification and elimination of reduced matters. And a continuous flow of water is necessary in a slow sand filter system.

Then, a water supply system by a pipe line system for 3 villages was completed in an arsenic contaminated area, west Bengal in Bangladesh in July, 2004. This is the first plant of slow sand filter for the local people in this country. The capacity of this plant is the water demand for 300 families (1,500 persons: daily use 15 liters per person).

The raw water is taken from an oxbow lake. There are two set of roughing filters and slow sand filters. The raw water flows through a chain of 4 roughing filters. The upflow system is adopted to the roughing filters. About 1 meter depth of gravel is filled in the roughing filters and there is about 10 cm water depth of supernatant above the gravel layer. The plankton and other organic particles are decomposed at the first roughing filter. Filamentous algae grow in the supernatant water in the roughing filters. There are the alternative process of decomposition by heterotrophic organisms and organic production by algae in the pre-treatment process of the roughing filters. In this process, hardly decomposed matter may be decomposed by the biological activity. Then, the water after the roughing filters becomes ready water for normal slow sand filter. Final filtrate water of slow sand filter becomes safe and delicious water to drink.

This system is composed with simple parts. This is based on the natural purification process.

# **The Evaluation of Sawmill Industry Waste as an Artificial Soil Matrix in East Kalimantan**

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## **Abstract**

East Kalimantan is the biggest one of province which producer wood wastes as consequence from potency amount of the wood production target. One of industry which raw material processing of the wood is sawmill industry. The average of sawmill production in East Kalimantan, since 2000 up to 2002 is about 250,000 m<sup>3</sup>/year from totally output which produced. So that if sawmill rendement is about to 40% from sawmill processing estimated, there are wastes about to 60% or about 150,000% m<sup>3</sup>. The potency amount of wood wastes in this case were not exploited optimum. As one alternative of wood wastes processing is conducted by GADE Systems (Garbage Automatic Decomposer Extinguisher Systems).

The revolution of the GADE Systems in Indonesia, especially in East Kalimantan must be introduced, because we hope to find the new inovation to choices the best material for this systems. For the application of the GADE Systems was made a mixed machine (GADE Machine). From the examination result in the field, the GADE machine is very practical, easy to use, brief time relative and the cheap making relative expense. So that can be recommended its use, especially for requirement local.

**Key Words:** Sawmill industry, wood wastes, rendement, GADE Systems (Garbage Automatic Decomposer Extinguisher Systems), GADE Machine.

# **Biomass Waste Management Activities In Indonesia - Trials in Bandung, Palangka Raya, and Samarinda -**

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## **Abstract**

Several types of GADE (Garbage Automatic Decomposer Extinguisher) system using sawdust as artificial soil matrix have been operated in Bandung, Palangka Raya, and Samarinda in Indonesia. The machine in Bandung is a Hitachi model, and the machine in Palangka Raya is a direct mixing type of hand-made, and the machines in Samarinda are the in-direct mixing type of hand-made with and without a mortar for mixing the brades.

All the systems degraded food oriented wastes successfully without formation of odor. Characteristics of the operation of each system will be introduced.

The evaluation of the residual sawdust after the operation for months as fertilizer or soil conditioner will be reported.

## **Sustaining agropastoralism on the Central Kalimantan peatland : Production of Sasendok**

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### **Abstract**

Kalampangan Livestock Experimental, Palangkaraya, Central Kalimantan was established since 2000 which is collaboration between JSPS – LIPI Core University Program on Environmental Conservation and Land Use Management of Wetland Ecosystem in Southeast, Asia. The establishment of experimental unit by entering livestock component to peatland management in order to (1) minimize the burning fire land, (2) reduce the soil acid by influencing the livestock manure, (3) study livestock management in peatland area, (4) increase farmer's income.

There are several domestic forages that is used by the farmer and spread out wider in the peatland secunder forest and it is not being cultivated. The limited number of forages is the main factor that caused the less of ruminats population in Central Kalimantan. Some programme has been tried to cultivate the good forage varieties by government institution cooperate with farmers but still unwork well. The main case of these because there is no suitability between introduction forages habitat and peatland area. According to the example above, the principle of developing forages in Kalimantan are due to : (1) it is domestic vegetation, (2) the technic of development is being accepted by farmers, (3) the introduction forages that has been improved it can make a good adaptation in peatland.

Sasendok (*Plantago major*) is a kind of main source of forages for cattle and goat that is being kept by the farmer in Kalampangan. The farmers take it from peatland area either in the forest or house yard. Sasendok is an active vegetation that spread through the rhizoma and ripe seed. Although its become forage sources for cattle and goats hence the farmers has not cultivated it.

The experiment by giving the nitrogen fertilizer treatment of the different level and giving compos treatment is being experienced in the 1 x 1.5 m<sup>2</sup> unit in June – September 2004. The result of experiment with the two treatments is increasingly more significant to Sasendok productivity than without the two treatments

**Key words:** Sasendok, forages, nitrogen, compos



## **Fish Cuisine in Central Kalimantan**

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### **Abstract**

Each place have a different cuisine. People in Central Kalimantan usually live surrounding the river or lake or swamp so that it is so easy to catch fish for their food. Local people prefer to eat fish, so that fishes become one of the most important food in Central Kalimantan. Fish cuisine in Central Kalimantan is very dominant and local people have their own way to cook. Variety of fish cuisine are ikan bakar (baked fish), ikan goreng with sambal asam, kind of juhu, pais or pepes, tanak lauk, kandas lauk. Each region in Central Kalimantan has special spice for their fish cuisine.

This research was conducted in some restaurants in Palangka Raya. Questionnaires were distributed to some students and people that live in Palangka Raya, Sigi Village and Takapan Village. Based on the research, we found there were 106 restaurants in Palangka Raya. The average amount of freshwater fishes cooked for each restaurant was between 20 and 80 kg fish/day. Although all people of Central Kalimantan like very much to consume freshwater fishes, the way of fish cooking was different between those who live in the city and those people in the village. We also found that people in the village are more often eating fish than the people in the city. Most villagers eat fish nearly everyday whereas people in the city only eat fish occasionally.

Most people in the city prefer to eat catfish/patin (*Pangasius sp.*), nila (*Tilapia nilotica*) and ikan mas (*Cyprinus carpio*) which is mostly cage-cultured fish than others fish, indicated by many restaurant selling that fish. However, in the village, most people prefer to eat natural freshwater fish, such as sheatfish/lais (*Kryptoterus sp.*), climbing perch/betok (*Anabas testudineus*) and sanggiringan (*Mystus nigriceps*). In the village, juhu which is a kind of soup, is very dominant cuisine, while in the city ikan bakar is more dominant.

**Key words :** Fish Cuisine, Central Kalimantan, freshwater fish

**Poster (S-3)**

# Chemical Properties of Humic Substances and the Possibility of Use for Environmental Remediation - Reduction and Solubilization Properties -

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## Abstract

**Introduction** Humic substance, which is one of main soil organic matters, is polymer electrolyte having many kinds of functional groups. Humic substance, therefore, has some chemical abilities such as complexing with heavy metal ions, reducing them and solubilizing water-insoluble compounds. Since humic substances are distributed widely and ubiquitously in environment, it is thought that the presence of humic substance affects the movement and the effect of pollutants on environment. Then the interaction between humic substances and some pollutants has been investigated. We also have reported the reducing ability of humic acid for hexavalent chromium and the solubilizing ability for some water-insoluble compounds. In this study, the reducing capacity of humic acids extracted from peat soil in Central Kalimantan and Bibai in Hokkaido were evaluated by equilibrium redox titration using hexacyanoferrate(III) ion as a titrant. The solubilizing ability of humic acid for water-insoluble compounds in coal tar was also investigated.

**Experimentals** Humic acids used in this study were extracted from peat soil and purified according to the protocol recommended by International Humic Substance Society(IHSS). The equilibrium titration method, where the next titrant was added after reaching the equilibrium potential, was applied to evaluate the reducing capacity because the reaction rate between humic acid and reducing titrant is very slow. The solubilizing ability was evaluated by measuring the concentration of some polycyclic aromatic hydrocarbons(PAHs) in the solution contacting with coal tar in the presence and absent of humic acid.

**Results and Discussion** The reducing capacity of humic acid depends on pH of the solution and increased increasing with pH. However, humic acid has much smaller reducing capacity than those of gallic acid and tannic acid, the precursors of humic acid. The reducing capacity also depends on the amount of the phenolic hydroxide group obtained by the analysis of functional groups. The humic acid in Kalimantan has the largest capacity among several humic acids investigated in this study. The solubility of PAHs in coal tar certainly enhanced in the presence of humic acid. The solubility increased with an increase in the concentration of humic acid and stirring time. PAHs having higher octanol/water distribution coefficient were solubilized more. These results suggest that humic acid has the possibility to be used as a reagent for reducing some heavy metal ions and solubilizing water-insoluble pollutants in environments without secondary contamination.

**Poster (S-3)**

# **Sustaining agropastoralism on the Central Kalimantan peatland : Forage production – a case study of Kalampangan Livestock Experimental**

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## **Abstract**

Kalampangan Livestock Experimental, Palangkaraya, Central Kalimantan was established since 2000 which is collaboration between JSPS – LIPI Core University Program on Environmental Conservation and Land Use Management of Wetland Ecosystem in Southeast, Asia. The establishment of experimental unit by entering livestock component to peatland management in order to (1) minimize the burning fire land, (2) reduce the soil acid by influencing the livestock manure, (3) study livestock management in peatland area, (4) increase farmer's income.

There are several domestic forages that is used by the farmer and spread out wider in the peatland secunder forest and it is not being cultivated. The limited number of forages is the main factor that caused the less of ruminats population in Central Kalimantan. Some programme has been tried to cultivate the good forage varieties by government institution cooperate with farmers but still unwork well. The main case of these because there is no suitability between introduction forages habitat and peatland area. According to the example above, the principle of developing forages in Kalimantan are due to : (1) it is domestic vegetation, (2) the technic of development is being accepted by farmers, (3) the introduction forages that has been improved it can make a good adaptation in peatland.

Domestic forages is dominated in the evaluation comparing to the introduction forages. The evaluation of developing forages is separated into 2 catagories : (1) grassland evaluation and (2) cultivation plot. There are 2 kind of forages that has been evaluated according to the type of growth, it is typically a bush and a tree.

The evaluation result of forage productivity in grassland is influenced by the total number of livestock, the season variation and the technic of forage management and livestock. Meanwhile, forage plant productivity in cultivation plot is influenced by the season, technic of forage management and intensity of harvesting. The combination of forage for uncertain time and the intensive plantation around house yard by establishing the technigue management by the farmer will increase not only the productivity of forages but also livestock productivity.

**Key words:** peatland, forage production, domestic and introduction forage

## Mineral Nutrient Content of Rainfall, Throughfall, and Stemflow in Two Sub-Types of Peat Swamp Forest in Central Kalimantan, Indonesia

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### Abstract

Throughfall, stemflow, and rainfall falling upon, peat swamp forest in the upper catchment of the Sebangau River in Central Kalimantan, Indonesia were sampled every two weeks from November 2000 to November 2001 and analyzed for total content of Ca, Mg, K, Na, Fe, Mn, P, ammonium and nitrite. Throughfall and stemflow were collected in three permanent study plots, 50 x 50 m, which were established in mixed swamp forest (MSF) and low pole forest (LPF). In each plot, throughfall collection vessels were located in a manner (fixed and roving) that enabled statistical analysis to be carried out on the data obtained. For the collection of stemflow, water is obtained from five trees of different diameter by means of plastic collars placed around their stems. Rainfall was collected from above the tree canopy in four rain gauges situated in riverine forest (1), mixed swamp forest (2) and low pole forest (1). Rainfall is slightly acid (pH between 5.55 and 6.46 with average  $5.96 \pm 0.35$ ) with a predominance of Ca and K. Throughfall and stemflow is enriched in most elements analysed compared to rainfall and its pH values are lower. Throughfall pH ranges from 4.15 to 5.32 (average  $4.76 \pm 0.33$ ) in mixed swamp forest and from pH 3.56 to 5.36 (average  $4.37 \pm 0.33$ ) in low pole forest. Stemflow pH ranges from 3.42 to 4.43 (average  $4.03 \pm 0.19$ ) in mixed swamp forest and from 2.88 to 4.01 (average  $3.57 \pm 0.11$ ) in low pole forest. Nutrient input in rainwater (rainfall), canopy leachate (throughfall), and stemflow showed temporal variation. The amount of throughfall and stemflow decreases with decreasing rainfall and in Mixed Swamp Forest throughfall is 1969 mm (71%) of the total precipitation whereas in Low Pole Forest throughfall it is 2170 mm (79%). Mixed swamp forest stemflow is 81.9 mm (2.97%) of the total precipitation whereas in Low pole forest stemflow it is 136 mm (4.9%). The order of magnitude of chemical elements reaching the forest floor in throughfall is calcium, potassium, ammonium, magnesium and sodium in Low Pole Forest, and potassium, calcium, ammonium, magnesium and sodium in Mixed swamp Forest.

**Keywords:** peat swamp forest, rainfall, throughfall, stemflow, chemical analysis

## Effect of Organic Matter, Cattle Manure and Lime on Growth and Nutrient Uptake of Sweet Corn (*Zea mays Saccharata Sturt*) on Peat Soil

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### Abstract

Problem of oligotrophic ombrogenous peat soils for agriculture can be mention here: low pH, low base saturation; low macro and micro nutrient. Productivity of peat soil can be improved by liming, fertilising, added cattle manure etc. Aim of the study to find out the effect of liming, organic matter, and cattle manure on growth and nutrient uptake by sweet corns. The study area is in the Palangka Raya University.

Completely Randomised Design was used in this study. Treatment of this study are BoPoKo; B1PoKo; BoP1Ko; BoPoK1; B1P1Ko; BoP1K1; B1PoK1; B1P1K1. Bo = without organic matter, B1= *Cashea Siamea* leaves, dosis 20 ton/ha; P0 = without cattle manure, P1 = cattle manure dosis 20 ton/ ha; Ko= without lime, K1 = lime, dosis 10 ton / ha. Tree replications are made for each treatment. DMRT are used for test among treatment at 5 % level.

Selected parameters are: height of corns; dry weight of shoot and roots; uptake of nutrient (N, P, K, Ca and Mg). Several soil properties are chosen as indicator, such as, pH, available-P exchangeable cation.

The result indicated that organic matter as individual did not show effect on height of corn dry weight on shoot and roots, and uptake of nutrient. Cattle manure has little effect on pH only. Lime has significant role to increase growth of corns, dry weight of shoot and roots, nutrient uptake, pH, available P, and exchangeable cation.

**Keywords:** peat soil, exchangeable cation, nutrient uptake; chemical analysis

Poster presentation

## Life on wetland in the Bangkau Village, South Kalimantan

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### Abstract

The present study was carried out on 18 July 2004 at the Bangkau village (S02°08'49.4"; E113°52'54.5"), located at the South Hulu Sungai District of the South Kalimantan province. This 19.5 km<sup>2</sup> village is inhabited by 1.622 people or 400 families where 20% of them are totally dependent on their surrounding wetland.

During the study we found that one major characteristics of wetland ecosystem in the village was the extremely high water level fluctuation. The difference between high and low water level could be up to 6 meters. Since the wetland water was regulated mainly by the rainfall, two contrast environmental conditions were observed in the wetland. During rainy season, the wetland was entirely flooded by water and, inversely, during the dry season it was covered by very dense vegetation. This regular changing from water environment to high plant biomass was an important factor in regulating high production of freshwater fishes in the wetland.

Within one year, 9 months period was the fish harvesting period from the wetland. During this period, villagers applied many different types of fishing gears such as *scope net*, *tempirai* and *beje* to capture fishes. All gears were developed by villagers to selectively catch fishes thereby maintain their sustainability from their very valuable wetland. As a result, freshwater fishes have long been the major source of income in the village. During the study we observed that each family could earn an average monthly income up to Rp.1.5 million by only spending 3 hours a day of their time to collect fishes from the dried wetland. However, the rest 3 months period during high water level season was the hard life for villagers. Since their wetland was entirely flooded, there was no land available for planting crops and the fishes were also difficult to be caught. In adaptation to this harsh environment, some villagers introduced a unique farming system on the water surface called "Ambul". Today, this floating water hyacinth (*Eichornia crassipes*) island is still applied in the village to cope their needs during regular poverty period on high water level season. This typical people adaptation to wetland ecosystem will be discussed briefly in the paper.

**Key words:** people, wetland, adaptation, fishery, income

**Oral (S-3)**

# **Podzolisation in Mal-Developed Coastal Peatland and Its Impact to Soil Management**

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## **Abstract**

Some peatsoils are sometimes in association with potential acid sulphate soils, meanwhile both of types of soils are situated in wetland ecosystem, therefore they have strong relationships each other. Development of wetland areas that were sponsored by government during last 3 decades ago caused many problems, among others produced many mal-developed area. These problems occurred due to drain off the wetlands without consider the real characteristics of the peat soils and their association potential acid sulphate soils. The results were disappearance of peat soils and oxidation of the pyritic sediments that create acid sulphate soils. Since the wetlands were dynamic ecosystem, the acid was spread over the wetlands that now became mal-developed area.

In the mal-developed areas that found in Sumatra and Kalimantan showed that due to drainage, there were vertical mobility of some elements and substances (including organic substances) that create a narrow bleached horizon with very poor nutrients. The formation of this horizon indicated that podzolisation proses took place in the mal-developed wetland soils. The podzolised horizon, although not thick enough, cause many problems in the soil management in wetland ecosystem.

**Key words:** wetland ecosystem, mal-developed area, podzolised horizon

**Oral (S-2)**

## Mushroom Culture Property of Woods from Peat Swamp Forest

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### Abstract

So many characteristic tree species exist in the peat swamp forest in central Kalimantan of Indonesia, but only a part of the species are used as wood resources, and much unutilized species still remain. Therefore, edible fungi culture properties and the chemical compositions of 16 tree species originated from this area were examined for the fundamental knowledge for carrying out effective continuous utilization.

Sixteen species of peat swamp forest trees were taken from Palangkaraya of Central Kalimantan. Debarked woods were milled into fine powder. For cultivation test, 3 species of edible fungi (*Lentinula edodes*, *Pleurotus ostreatus*, *P. pulmonarius*) maintained on the PDA medium were used. They were inoculated on the wood meal supplemented Czapek agar medium, and cultured at 25 C for 7-14 days. Chemical composition of the woods were analyzed about the following items ; holocellulose, lignin (JIS & APPITA), alcohol-benzen extractive, cold water extractive, hot water extractive, and ash.

The lignin content measured by the JIS method showed higher value than those of measured by the APPITA method. Compared with the beech, their contents of alcohol-benzene extractive and lignin were high tendency.

For all of the tested strains, Tumih, Meranti-bunga and Meranti-rawa showed flourishing growth more than equivalent to the beech. Their sawdusts were seemed to be available for these edible mushroom cultivation. On the other hand, Galam-tikus and Kayu-jambu showed remarkable growth inhibition for most of the tested strains. As these belong to same genus (*Syzygium*), it is suggested that possibility of containing a common growth inhibitor for wood rotting fungi.

**Oral (S-3)**



## Toward the Domestication of Local Fishes in Central Kalimantan

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### Abstract

Fish diversity of inland waters in Central Kalimantan is high that make them very potential to be domesticated. Domestication of freshwater local fish in Central Kalimantan has not well-documented yet. Therefore, the aim of the study was to try the domestication of several local fishes in this region.

This study was conducted in Limnological Laboratory of Fishery Department, the University of Palangka Raya from July 2004 to present. In this experiment, we used 4 aquariums with the size of 80 X 50 X 65 cm and 5 aquariums with the size of 75 x 40 x 36 cm. Freshwater fishes were tried out: *Betta akarensis*, *Helostoma temminckii*, *Osteochilus melanopleura*, *Oxyliotris urophthalmoides*, *Nandus nebulosus*, *Chaca bankanensis*, *Labiobarbus ocelatus*, *Barbodes schwanenfeldii*, *Trichogaster leeri*, *Rasbora cephalotaenia*, *Luciocephalus pulcher*, *Rasbora boornensis*, *Osteochilus microcephalus*, *Kryptopterus lais*, *Labiobarbus kuhlii*, *Pristolepis grooti*, *Macrognathus aculeatus*, *Sphaerichthys osphromenoides*, *Rasbora boorneensis*, *Puntius rhomboocelatus*, *Osteochilus triporos*, *Puntiuplites Waandersi*, *Mystus nigriceps*, *Leptobarbus hoeveni*, *Trichogaster trichopterus*, *Cyclocheilichthys apogon*, *Osteochilus pentalineatus*, *Mystus micracanthus*, *Osteochilus triporos*, *Kryptopterus macrocephalus*, *Kryptopterus kryptopterus*, *Botia hypenophysa*, *Pseudotropius moolenburghae*, and *Zenarchopterus dispar*. These fishes were collected in lake Batu and Tehang.

The fishes were caught using cash net and hook and line at day time, while push net were operated at night. Collected of fishes was brought to the laboratory in a container with aerator. To support our effort, on October 2004, our counterparts Hokkaido University have also supplied us commercial natural diets of fishes consisting of phytoplankton (*Chlorella sp.*) and 5 species of zooplankton ((*Ceriodaphnia dubia*, *Daphnia pulex*, *Daphnia galeata*, *Ceriodaphnia rebuculata* and *Daphnia magna*). So, at that experiment we used four different diets for our fishes : pellet, phytoplankton, zooplankton and small fishes. Nevertheless, we still found a relatively high mortality of our domesticated fishes.

**Key words** : Local fishes, Domestication, Aquarium

# Valuing Wetland Ecosystems: A Review

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## **Abstract**

This presentation summarizes the major economic studies on valuation of wetland ecosystems. After touching upon the philosophy of monetary valuation of environment, we review the four popular techniques for environmental valuation: the travel cost method, the contingent valuation method, hedonic pricing, and production function approach. Then we survey the results of case studies in various regions, including Indonesia. Wetlands are complex multi-functional ecosystems that provide both market goods (fishery, timber, etc) and non-market services (flood water control, nitrogen abatement, etc). Special attention is paid to the difficulties in the extant literature due to these complex roles of wetland ecosystems.

**Oral (S-3)**

# Traditional Methods of Freshwater Fish Preservation In Central Kalimantan

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## Abstract

Freshwater fish production from fish catching effort in Central Kalimantan showed that it is higher in dry season than in rainy season. High catching fish in dry season it makes fish production accumulated. Because of fish easy to be rotten and very difficult to sell at bad and not fresh condition, people seek method for fish preservation. Freshwater fish are preserved to be whether consumed or sold again in the market because the preserved product can be kept in a long time.

This research was conducted in 6 (six) markets in Palangka Raya city, Central Kalimantan i.e. Pasar Besar, Pasar Subuh, Pasar Kahayan, Pasar PU, Pasar Mini and Pasar Rajawali. During the study, primary and secondary data were collected by conducting field observation.

From the research in six markets in Palangka Raya city there we found 3 (three) types of freshwater fish preservation products sold in the markets, namely *ikan asin* (salty fish), *wadi* and *pakasem* (wet fermented salty fish). Several species of freshwater fish that are common to be preserved including Lais (*Kryptopterus* sp.), Baung (*Hemibragus nemurus*), Patin (*Pangasius* sp.), Ikan Mas (*Cyprinus carpio*), Nila (*Oreochromis niloticus*), Jelawat (*Leptobarbus hoevenii*), Toman (*Channa pleurophthalmus*), Betok (*Anabas testudineus*), Sepat (*Trichogaster* sp.), Gabus (*Channa striata*). Each type of fish preservation product has specific and popular fish to be used. For example, the most popular fish to be made as *ikan asin* is Lais and Gabus, while the most popular fish to be made as *wadi* and *pakasem* is Patin, Betok and Ikan Mas

**Key words** : Freshwater fish, Preservation, Traditional methods

**Poster (S-3)**

## **Freshwater fish market in Palangka Raya**

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### **Abstract**

Freshwater fish is one of protein sources for Palangka Raya community, either collected from the wild or cage-culture. Palangka Raya people consume more frequently freshwater fish than other sources of protein. This is because freshwater fishes are easier to find, more tasty and cheaper. Generally, Palangka Raya people obtain freshwater fishes from local markets. This study was intended to provide information of fresh water fish market in Palangka Raya city.

The study was conducted on October, from 26<sup>th</sup> to 29<sup>th</sup> 2004 by the observing 6 local markets in Palangka Raya city i.e Pasar Subuh, Pasar Besar, Pasar Kahayan, Pasar Mini, Pasar PU and Pasar Rajawali.

Our results revealed that fresh water fishes were sold in all six local markets in Palangka Raya. The number of fish seller varied among markets. According to working time of the seller, these markets can be divided into 3 working times i.e from morning to noon, all day and late afternoon to evening. We found 23 species of freshwater fishes sold at 6 markets in Palangka Raya. The fishes were collected either from the wild (swamps, lakes and rivers) or from cage-culture. The daily amount of freshwater fish sold by each fish seller ranged from 10–100 kg. The average of fish sold was 41 kg/day/seller. The price of each fish varied among species and tended to fluctuate from time to time. The different and fluctuation of price were influenced by kind of fish, condition of fish, season and the distance of transportation. During the study, we also found there were 3 types of marketing freshwater fish chains in Palangka Raya.

**Key Words** : Freshwater fish, Market, Palangka Raya

**Poster (S-3)**

## Water Hyacinth and Water Pollution

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### **Abstract**

Floting agnatic macrophytes are often reported as nuisande agnatic weeds arpecially in tropical region. They are difficult to control in the natural environment and have a low productivity. Nevertheles,water hyacinth ( *Eichhornia Crassiper*) has high productivity and ras rapid vegetative reproduction. In 1999 it was reported by kanii (2000) that water ryacinth existed in two dystrophic lakes in Central Kalimantan namely hake tundai and hake sabuah. The degradation of water guality can atimulate the growth of aguatic weeds and water hyacinth has been apreading and expanding throughtout Indonesia within a century. Water hyacinth in reported to have the ability to accumulate excess nutrientis and aboorb toxic reavy metaly aware of these properties of water ryacinth, it is there fore imfortant to manage this species in controlled environments for pollution removal

# Utilization of Epiphytic and Endophytic Bacteria for Sustainable, Hydrophilous Agricultural Management of Wet, Abandoned Tropical Peat Land to Protect Peat Soil and Swampy Forest from Fire

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## Abstract

Now a day, tropical peat soil is recognized as a huge carbon sink, and swampy forest developed throughout the peat land is a cradle of the peat soil. Plain peat lands, previously developed for agricultural farm by destroying swampy forests in southeast regions of Central Kalimantan, have become the abandoned area due to frequent and huge peat fires. To prevent such non-shaded, dry peat land from the peat fire and bio-degradation, it is reasonable to keep the water table of the land high; however, it is probably necessary to motivate the local people such land management more positively, not only for social reasons but also for economical benefits. A low-input, extensive agriculture in such wetland is therefore proposed. Although serious problems, soil acidity and nutrient deficiency, lied on such peat land to use it for agricultural management, new findings on choice of crops and their cultivation manners are awaited for extensive agriculture in such adverse land.

The root symbiotic microbes often play an important role in the survival of their host plants by assisting effective nutrient uptake in stressed soils. Root nodulating bacteria and ectomycorrhizal and arbuscular mycorrhizal fungi are those representative partners of plants; however, in most of the cases they have a narrow host-specificity and/or a low adaptability to wet and acidic soil conditions. In contrast, epiphytic and/or endophytic bacteria, including non-nodulating, plant growth promoting rhizobacteria (PGPRs) and mycorrhizal helper bacteria (MHBs), are more effective partners for plants under any adverse soil environments. Our choice for low-cost agricultural management in wet peat land is cultivation of hydrophilous vegetables and crops, such as taro, kankun sago and paddy using such epiphytic and/or endophytic bacteria as biofertilizers.

Therefore, we propose a new agriculture-agroforest system to rehabilitate the destroyed peat land, combining hydrophilous agriculture and reforestation to grow shading trees, such as *Anacardia* sp. or some *Artocarpus* sp. highly adaptable to peat soil. It is just started to search such water-tolerant and practically effective biofertilizers as local bioresources. In human dimension approach, effective peat soil protection should be based up on such human activity associated with economical motivation, and what natural scientists can do for it is to accumulate knowledge and data for practical land managements.

Oral (S-3)

# **Local Efforts of Human Resource Development for Sustainable Peatland Use: Agricultural College and Farmers' School Approaches in Indragiri Hilir, Riau Province, Indonesia**

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## **Abstract**

In order to propose appropriate local efforts of human resource development for sustainable peatland use, we examined two activities in Tembilahan, Indragiri Hilir Regency, Riau Province of Sumatra Island, Indonesia. One was practice-oriented higher education in *Politeknik Pertanian Tembilahan* (Tembilahan Polytechnic College of Agriculture), another was farmers' training in an NGO, called *Riau Tani Lestari*.

The Polytechnic College was established in 2003 to educate and train local high-school graduates for agricultural and related sectors in Riau province and the surroundings. Since the establishment, the college has been shortage of funds to complete its facilities such as classrooms, a library, laboratories. In the education system, practices in estates are emphasized to develop human resources "ready to work in the fields."

*Riau Tani Lestari*, an NGO newly founded in 2004, has been seeking a suitable training course for farmers in peatland. The main purpose is to develop independent farmers through farmers' school approach, especially commercial farming in the training farm. At present, commercial mixed farming, such as vegetables, poultry, and cattle with composting and charcoal making, is expected to support sustainability in their agricultural production on the peatland. The participants will be able to apply this farm model as an alternative to existing slash and burn systems and contribute to prevent peat fire.

Both organizations are training local human resources who intend to stay in their own region. If both graduates play active roles as agricultural extensionists or farmer leaders to different districts in the region, ideas of conservation and sustainable use of peatland can be widely spread within the local people. Knowledge and practices on the topics, however, are not yet formed as training and extension materials. In order to support these local efforts on human resource development, scientific research results on peatland should be translated into readable textbooks or manuals for extension and distributed in rural areas.

## Non fisheries resources of Wetland Ecosystem In Central Kalimantan

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### Abstract

Central Kalimantan is rich in biodiversity especially plant diversity which grows on wetland ecosystem. This is related with the position of the area which is in the equator that has constant rainfall and high temperature through out the year. One of the biodiversity is the aquatic plants grown on peatland, rivers and lakes. Some of them have economical value for the local people.

The knowledge of the variety and benefit of aquatic plants have been transferred generation to generation but vary among person and time. This is due to the lack of scientific publications on the existence of the existing aquatic plants. As consequence, only very few people are aware on the preservation of aquatic plants and their habitat.

The purpose of this study was to collect data of the aquatic plant species, which are beneficial for the local people of Central Kalimantan. The data included the use and the present condition of their natural habitats. The data were collected by conducting literature study, field observation and interview. The sources of the data included producing people, trader and user that live in Palangka Raya city and its surrounding area.

Our study showed that there were at least 17 different species at aquatic plants that have economical value in Central Kalimantan. These were including : *Azolla piñata* (Kararewon), *Pistia stratiotes* (Apu-apu), *Haguana* sp (Bakung), *Diplazium esculentum* (Bajey), *Eichhornia crassipes* (Eceng gondok), *Monochoria hastata* (Eceng kebo), *Lymnocharis flava* (Genjer), *Ipomea aquatica* (Kangkung), *Cryptocoryne ciliata* (Keladi air), *Pandanus* sp (Kajang), *Stenochalaena palutris* (Kalakai), *Echinochloa stagnina* (Kumpai), *Salvinia molesta* (Kiambang), *Fimbristylis* sp (Purun danau), *Neptunia plena* (Sikejut), *Nymphae stellata* (Teratai), *Lemna* sp (Gulma itik).

These plants are used as material for various goods such as plaited mat, traditional back pack vegetable soup and livestock woof.

**Key words** : Aquatic plants, use, natural habitat.



## Threats to the Sustainability of Inland Water Fishery in Central Kalimantan

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### **Abstract**

Freshwater ecosystem plays important roles for human being as water resources and as environment for aquatic living resources, supporting human living standard. Inland water area, however, is a fragile ecosystem, strongly affected by human activities. Management of inland water fishery needs comprehensive understanding socio-economic aspects as well as understanding components of inland waters and their relationship in the ecosystem, since increased population density, developed technologies and unsustainable economic development as main pressure on Indonesian inland water can directly and indirectly influence and damage aquatic environment. Therefore, we carried out an inventory on threatened factors to the sustainability of inland water fishery in Central Kalimantan.

There are several human activities that can be categorized as threats to inland water in Central Kalimantan since freshwater bodies are important uses for local communities especially for fishing and water supply. In some inland water areas of this region, fishes have been over-fishing due to fish exploitation using unselective fishing gears, chemical substances and electric shocker. Local community behaviour to dump domestic waste to water bodies is also as main threat to the sustainability of water resources. The domestic waste contaminates watercourses and then may cause hazard to human health, harm to living resources and damage to amenity. Moreover, clear-cut forest in forestry practices may damage natural water management and eventually damage water ecosystems. Illegal mining along main rivers i.e. Kahayan, Barito and Rungan rivers in Central Kalimantan, is also threatening activity because of mercury use for gold amalgamation that may contaminate water ecosystem. Since Central Kalimantan watercourses are used as main routes of transportation to connect people settlements, leaking of fuels from small boat and ship may occur, contributing oil pollution to the waters. Agricultural practices such as application of fertilizer, manure, and pesticides might also contribute nutrient run-off to the waterways causing eutrophication of water bodies. Therefore, addressing many threats to inland water fishery in Central Kalimantan requires comprehensive approach. This includes participation multi-disciplines and multi-stakeholders.

**Keywords:** inland water, fishery, threats

**Oral (S-1)**

## **The Life of a Local Fisherman Family in the Lake Takapan of Central Kalimantan**

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### **Abstract**

Lake Takapan is one of fishing ground in Central Kalimantan. There are 20 families live at surrounding of this lake as fisherman. The life of these fishermen family rely on fishery activities. This may be because of their main income is only from catching and selling of fishes. The aim of this research was figure out the life of a local fisherman family in the Lake Takapan of Central Kalimantan.

To collect data the observation method was applied on October, 28<sup>th</sup> 2004 by interviewing one local fisherman family at Lake Takapan in which his income is only from fisheries activity.

Our study showed that the fisherman at Lake Takapan collected fishes on two different times in a day, i.e in the morning from 5 to 7 am and in the afternoon from 3 to 5 pm. Fishing gears used were, mostly traditional ones such as *jabak* (trap), *rengge* (gill net) and *rempa* (net). Amount of fishes collected ranged from 5 - 15 kg/day consisting of *Hemibagrus nemurus* (Baung), *Kryptoterus* sp. (Lais), *Channa striata* (Haruan), *Channa pleurophthalmus* (Karandang) and *Macrobrachium* sp. (Udang Galah). About 80 % of caught fishes were sold to fish collector come from Palangka Raya city and 20 % was consumed by themselves. The price of fishes fluctuated depend on species of fishes and season. Based on the observation, the price of fish ranged from Rp. 8,000 to Rp. 12,000,- /kg. The income from fishery could generally support the life of fisherman family and also to finance the education their children. The living cost of a fisherman family was about Rp. 30.000,-/day. The detail information will be discussed in the full paper.

**Key words** : fisherman, family, fishery, income.

**Oral (S-1)**