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[Home](#)[Archive](#)[Submit Paper](#)[Author Guidelines](#)[Editorial Board](#)[Publication Fee](#)**Title:** Rubber seed shells (Hevea Brasiliensis): An adsorbent used for the removal of Rhodamine B dye**Author (s):** Rachel Yvonne Nadarajah, Rosmawani Mohammad and Mardawani Mohamad

Abstract: Rubber seed shells (RSS) are seemingly useless and rapidly becoming an agricultural waste. As the industrial world is rapidly developing and becoming technologically advanced in making products, the environment is getting more polluted. The most polluted is the main source of water supply. Waste water treatments are expensive. Rhodamine B (RB) dye is used in all types of industries such as textile, leather, paint, paper, plastics, and etc. Therefore, this project aims to reveal the use of RSS (agricultural waste) as adsorbents for the removal of RB dye. The effect of various parameters such as adsorbent size, adsorbent dosage, initial dye concentration, contact time, and pH were studied. The study showed that up to 99.52% of RB removal can be achieved under optimum conditions (adsorbent size: 0.063 mm, adsorbent dosage: 3.0 g, initial dye concentration: 100 mg/L, contact time: 24 hours and pH 3). The experimental data were analysed with the Langmuir and Freundlich adsorption isotherm models. The equilibrium data were best described in the Langmuir model with a maximum adsorption capacity of 3.185 mg/g. In conclusion, this study indicated that RSS have the potential to become low-cost adsorbents for the removal of RB dye in waste water treatment.

[Full Text](#)**Title:** Optimal operation of renewable energy irrigation system using particle swarm optimization**Author (s):** Ahmed Moubarak, Gaber El-Saady and El-Noby A. Ibrahim

Abstract: In rural areas which are located far from the electrical grid, renewable energy systems such as photovoltaic (PV) energy are investigated. The most popular PV application is solar water pumping for irrigation. DC-DC converter and maximum power point tracking are used because the PV modules output varies widely due to varying weather conditions. The water pump is driven by a three phase induction motor through a voltage source inverter (VSI). However, the control of induction motor is known to be difficult because it's highly non-linear and time variant. One method to mitigate this is by using vector control techniques to control the VSI as they offer a number of benefits including speed control and regulation over a wide range and fast dynamic response. The proportional - integral (PI) controller is most commonly used in the speed control loop of vector control. This paper deals with the design of the speed PI controller parameters (gains) using particle swarm optimization (PSO) technique and compares it with the conventional Ziegler-Nichols (ZN) method. Different objective functions have been proposed which are used to evaluate the optimization algorithm. The optimum solution mainly converges to a minimum error which affects the control parameters such as the maximum overshoot, rise time and settling time of the system. Simulation results are obtained using Matlab/Simulink program for photovoltaic pump application during load variation (pump head and flow rate variation). The results show the advantage of the PSO-based optimization approach.

[Full Text](#)**Title:** Structural behavior of sustainable Hollow Core Slabs reinforced with hybrid fibers**Author (s):** Zainab M. Hussein, Wasan Ismail Khalil and Hisham Khalid Ahmed

Abstract: Concrete Hollow Core Slabs (HCS) is one type of roofing that are widely used in all the world in residential and industrial buildings due to, the reduction of self-weight, and the economic and thermal insulation of these building units. The recycling of waste from construction and demolition of old buildings minimizes the environmental problems and encourages sustainability. The aim of this study is to produce sustainable HCS specimens reinforced with mono or hybrid (triple) fibers of different types and dimensions and studying their structural behavior. Fibers used include, hooked end steel fiber with aspect ratio of 60 (type S1), micro-steel fiber with aspect ratio of 65 (type S), and polypropylene fiber (PP) with aspect ratio of 667. Five hollow core slabs (HCS) were casted including, three HCS specimens containing crushed clay brick as coarse Lightweight Aggregate (LWA), the first one is plain HCS specimen (without fibers), the second is HCS with mono fiber (macro-steel fiber type S1 with volume fraction of 0.75%), and the third is HCS specimens reinforced with triple hybrid fiber (0.25% steel fiber type S1+ 0.25% polypropylene fiber + 0.25% steel fiber type S), two HCS specimens with artificial LWA, one is plain HCS specimen (without fibers) and the other is one HCS specimens reinforced with triple hybrid fiber (0.25% steel fiber type S1+ 0.25% polypropylene fiber + 0.25% steel fiber type S) were prepared. Load-deflection relationship, first crack and ultimate loads, and ductility ratio of HCS specimens were studied. Hollow core slab specimens reinforced with fibers show considerable improvement in ductility ratio in ductility ratio relative to plain specimens. The percentages of increase in ductility ratio of HCS specimen containing crushed clay brick LWA reinforced with mono steel fiber and specimen reinforced with triple hybrid fiber are

297.4% and 351.3% respectively, while for HCS specimen with artificial LWA reinforced with triple hybrid fiber is 386.5% relative to the corresponding reference HCS specimen. Generally, the experimental results indicate that HCS specimens containing produced LWA have better properties than specimens containing crushed clay brick LWA. Generally, the results indicate that sustainable HCS reinforced with fibers can be used as roofing system in buildings.

[Full Text](#)

Title: Kinetic study of Nano-Magnesium oxalate precipitated from bittern

Author (s): Hanem A. Sibak, Shadia A. El-Rafie, Shakinaz A. El-Sherbini, Randa M. Osman, Marwa Said and Rania Ramadan

Abstract: One of the methods to prepare nano-crystals metal oxide (MgO) is by using a precipitation method. Magnesium oxalate as a valuable chemical almost produced in pure grade from seawater bittern by precipitation process. In this paper, kinetics of magnesium oxalate precipitation from sea bittern was studied. The rate constants determined at different temperatures, Molar ratios and pH. The activation parameters were also calculated. Sea bittern from salt production unit of El-Mex saline company is containing about 85.7 g.L⁻¹ Mg²⁺. Detailed characterization involving XRD, TEM and TGA was investigated. The results show that The precipitation of magnesium oxalate from sea bittern is first order with respect to the concentration of magnesium oxalate at pH=4, MR=1:1 and temp.=25°C Also, The rate constant doesn't strongly affected by increasing temperature so the optimum operating reaction temperature is 25°C. The spherical Magnesium oxalate with uniform diameter of about 0.5 µm was obtained with purity higher than 98%.

[Full Text](#)

Title: The effects of vortex shedding on the aerodynamic performance of airfoils

Author (s): Esther Rami Sikien, Aslam Abdullah, Mohd. Fadhli Zulkafli and Mohammad Zulafif Rahim

Abstract: This is a comparative study involving various National Advisory Committee for Aeronautics (NACA) airfoils NACA 0012, NACA 0024, NACA 4412 and NACA 4424. The numerical simulation involves the air flow passing these models at high Reynolds number and various angles of attack. The study focuses mainly on the aerodynamic performance as represented by lift and drag coefficients. The Computational Fluid Dynamics simulation has been carried out in order to understand the phenomena of vortex shedding. The aim is to investigate the effects of vortex shedding on the aerodynamic performance of airfoils which has still been widely discussed over the years. The methodology has been validated; by using Spalart-Allmaras, K-epsilon and inviscid models, the first with the turbulence intensity and backflow of 0.10% contributed to relatively accurate result. The outcome reveals that there are few aspects that need to be considered in order to control or delay vortex shedding phenomena such as thickness-to-chord ratio, airfoil types, Reynolds number and whether or not it involves transient flow.

[Full Text](#)

Title: Synthesis of palmitoyl-ethanolamide from palmitic acid and monoethanolamine: Analysis of variance and surfactant characteristics

Author (s): Zuhrina Masyithah, Muhammad Ashari, Nur Annisa, Erwin and Armansyah Ginting

Abstract: Analysis of variance and characteristics of surfactant palmitoyl-ethanolamide was observed in this study. Palm oil fraction, palmitic acid (PA), is reacted with monoethanolamine (MEA) to produce palmitoyl-ethanolamide using ZrCl₄ catalyst and a mixed solvent of isopropanol-hexane. The observed effect of substrate mole ratio (1/6.6-1/13.4 PA/MEA), catalyst concentration (1.6-8.4 w/w PA) and solvent ratio (0.32/1-3.7/1 v/w PA) to the conversion of palmitic acid was arrange by Central Composite Design (CCD) and performed using Response Surface Methodology (RSM). In the analysis of variance, observed the assumptions of normality, homoscedasticity, and independence to ensure the significance of the regression model that is compiled. The results of analysis of variance indicate that the required assumptions have been met and the regression model made is appropriate and usable. The characteristic test of surfactant palmitoyl-ethanolamide showed that the value of HLB palmitoyl-ethanolamide was 12.857 with the decrease of the surface tension of 32.61 dyne/cm.

[Full Text](#)

Title: Contribution of geostatistical analysis for the assessment of RMR and geomechanical parameters

Author (s): Amine Soufi, Lahcen Bahi, Latifa Oquadif

Abstract: Geotechnical and engineering geology practitioners are always looking out for tools which can help understand and reduce the large uncertainty and variations in rock masses after complex geological processes. Relying on traditional interpolation techniques for geotechnical variables may lead to large uncertainty and major stability risk in the mining phase. The present paper proposes a direct and indirect methodology based on geostatistical estimation and simulation techniques to determine the expected Rock Mass Rating (RMR) and its underlying parameters, each geostatistical model identifies potential risk-prone areas in which failures could be experienced, superposing the different resulting maps allowed us to define low-risk conservative RMR model. A total of 115 underground rock blocks samples from five mining openings were examined for the rock mass quality using the RMR, Q and RMI characterization systems. Cross-validation and jack-knifing techniques showed that the proposed indirect estimation and simulation methods outperformed the more frequently used direct approach and shows a more accurate map with a low error coefficient which makes them adequate for RMR modeling. The resulting map of the indirect approach allowed taking into account the nonlinear nature, directional behavior of the RMR and its constitutive parameters which can be used to assist engineers in proposing suitable excavation techniques and an appropriate support system. The developed model help to assess different geomechanical parameters that can use to develop numerical models that explicitly consider the rock mass heterogeneity.

[Full Text](#)

Title: Cross-platform recognition of unknown identical users in multiple Social Media Networks

Author (s): N. Naga Priyanka, N. Geetha and A. Viji Amutha Mary

Abstract: From very recent past years have witnessed the requirement and evolution of a vibrant research Crew on a large

variation of online Social Media Network (SMN) platforms. Recognizing anonymous, same yet identical users among multiple SMNs is still a major problem. Clearly, saying that cross-platform exploration may help solve too many problems in social computing in both theory and applications. Up to now public profiles can be duplicated and easily impersonated by users with different purposes, most current user identification resolutions, which mainly focus on text mining of users' public profiles, fragile. Some studies have attempted to match users based on the location and timing of user content as well as writing style. However, the locations are sparse in the majority of SMNs, and writing style is difficult to discern from the short sentences of leading SMNs such as, Sina Micro blog and Twitter. Moreover, up to now online SMNs are quite symmetric, existing user identification schemes based on network structure are not effective. The real-world friend cycle is highly individual and virtually no two users share a congruent friend cycle. So that, it is more accurate to use a friendship structure to analyze cross-platform SMNs. Up to now anonymous users were influenced to set up similar friendship structures in the different SMNs, here they proposed the Friend Relationship-Based User Identification (FRUI) algorithm. FRUI Algorithm calculates a match degree for all candidate User Matched Pairs (UMPs) only, UMP with top ranks are considered as identical users. We also developed two propositions to improve the efficiency of the algorithm. The Results of these extensive experiments demonstrate that FRUI performs much better than current network structure-based algorithms.

[Full Text](#)

Title: Chalcogenide semiconductor nanoparticles embedded in polymer matrix: Critical approach

Author (s): Manoj Kumar

Abstract: Nanocomposites of polymer electrolyte are prepared by embedding copper sulfide or bismuth sulfide chalcogenide semiconductor particles in polymer electrolyte (PEO:NH₄ClO₄). The process of preparation is established by passing the hydrogen sulphide (H₂S) through the polymer complex (PEO:NH₄ClO₄+ x wt.% copper sulphate/bismuth nitrate). Total conductivity is measured by semicircular cole-cole plots which indicated one order of increase of bulk conductivity (10⁻⁶ S/cm to 10⁻⁵ S/cm) with the dispersal of chalcogenide semiconductor particles (Bi₂S₃/CuS) in the complex. Contribution of electronic conductivity or ionic conductivity to the total conductivity is measured the Wagner's polarisation plots. SEM studies showed the non-uniform distribution of the chalcogenide particles ranging from the composites ranging from micro to nano sizes, TEM studies showed chain type structure for the interconnected (Bi₂S₃/CuS) dispersoid. The band gap of different colored composite films are measured by optical absorption studies which showed change in the band gap with change of size of dispersoid from micro to nano size.

[Full Text](#)

Title: Indirect measurement of free-stream turbulence level in wind tunnels

Author (s): Ercan Erturk and Orhan Gokcol

Abstract: In this study we investigate the possibility of predicting the free stream turbulence levels by an indirect measurement. The main motivation for this is that in some wind tunnels direct hot wire measurements are not possible and there is a need to measure the turbulence levels in these wind tunnels. We constructed a flat-plate model with a 6:1 ellipse as a leading edge and place it inside a wind tunnel. Inside the wind tunnel the turbulence was produced by one of three different perforated grids, with different holes and mesh sizes. The free-stream turbulence conditions were documented for the three grids in terms of the total r.m.s. and spectra of stream wise velocity fluctuations. The response of the boundary layer near the leading edge was then measured through wall-normal profiles of the mean and r.m.s. velocity fluctuations. We find a linear input-output response of the Klebanoff mode amplitude with the free-stream turbulence level.

[Full Text](#)

Title: A review: Mechanism, materials and properties of self-curing concrete

Author (s): Ruhail Pervez Memon, Abdul Rahman Bin Mohd. Sam, Abdullah Zawawi Awang, Ghasan Fahim Huseien and Uroosa Memon

Abstract: Concrete is most widely used material in the construction industry, it also needs a lot of water for its production, so it is an urgent need of research to minimize the use water to produce concrete. This paper review about the materials used as self-curing agents, mechanism of self-curing and the properties of different type of concrete when subjected to self-curing method. Self-curing technology is the process which hydrate the cement internally in concrete, no external source needed for curing such as water curing. Mostly concrete goes under extensive self-desiccation, autogenous shrinkage and other properties of concrete can be affected due to improper curing. Different researchers have used different materials such as porous lightweight aggregates, chemicals admixtures, polymers, natural fibers and pozzolanic as self-curing agents in different ways, which have ability to withstand high amount of water. Thesis self-curing agents used as replacement with aggregates and used as infill material. Physical, mechanical, durability and microstructure properties has been carried out by researchers to evaluate the efficiency of self-curing in concrete. Results indicate that by adopting self-curing process in concrete improve properties of concrete. Most of self-curing research carried out in high-performance concrete to solve the shrinkage problem due to low water cement ratio.

[Full Text](#)

Title: Design and implementation of embedded true parallelism jammer system using FPGA-SoC for low design complexity

Author (s): Hussein Ibrahim and Muataz H. Salih

Abstract: The condition that drives a system to complete the processing of a number of functions within a given amount of time is called the real-time system. A projective missile system's processing platforms face two major issues: high cost and structural complexity. The system structure's complexity is a result of various reasons that include the mechanism utilized in the system in order to perform the system functionality. This mechanism can lead to delays in data processing because various factors, such as the synchronisation of the system modules' signals, the processing unit's architecture, and the unit's computational power. In order to lessen system complexity and system cost, true parallelism mechanism is applied over the embedded system, along with a concurrent structure. The FPGA platform (DE1-SoC) was used as the implementation environment for this system. This led to an enriched implemented system that had low costs. Furthermore, the system complexity is lessened since the system uses a concurrent structure. Some of the modules that are closely related to the system are implemented to support main processing module. In this system, the signals covered were in four directions. The total logic element was (5032) and total registers was (5180). The Phase Locked Loop up to (1.6) GHz was manipulated in order to allow the system cover a wide spectrum of signals with high accuracy of computing process. Furthermore, the laser projective frequency jamming system is capable of

processing multiple frequencies at a time. The implementation was able to obtain acceptable levels of throughput and it also lowered the complexity. Furthermore, the structural design methodology also makes it possible for the embedded concurrent computing architecture to be scalable while the entire system grows.

[Full Text](#)

Title: Effects of different dose of zeolite (clinoptilolite) in improving water quality and growth performance of Red Hybrid Tilapia (*Oreochromis Niloticus*)

Author (s): Rabiatul Adawiyah Meor Mohamad Zain, Nur Farrah IzzatyShaari, Mohamad Faiz Mohd Amin and Musfiroh Jani

Abstract: The optimum fish production is totally dependent on the physical, chemical and biological qualities of water. Optimal water quality varies by species and must be monitored to ensure fish growth and survival. The effects of different dose of zeolite to improve the water quality and growth performance of Red Hybrid Tilapia (*Oreochromis Niloticus*) were investigated in the present study. Twenty tilapia fry were placed in an aquarium with capacity of 30 liter of water. Natural zeolite (clinoptilolite) with different dose of 0 (control), 5, 10, 15, 20 g/L added into the water and the experiment was carried out in 60 days. The obtained result showed that ammonia, nitrite, and nitrate levels were significantly reduced in treated water compared with control. The lowest ammonia levels recorded in 15 g/L treatment of zeolite, consistent with nitrite and nitrate. However for total phosphorus and organic phosphorus (orthophosphates), the lowest concentration obtained was from addition of 10 g/L of zeolite. At the end of study, the growth performance of fish treated with addition of 20 g/L and 15 g/L of zeolite were significantly more compared to other groups. According to the results, it showed that optimum growth of fish can be obtained with a good water quality. In conclusion, the addition of zeolite is significant for the improvement of water quality and growth performance of Red Hybrid Tilapia (*Oreochromisniloticus*).

[Full Text](#)

Title: A new method of location estimation for fingerprinting localization technique of indoor positioning system

Author (s): Rhowel Dellosa, Arnel Fajardo and Ruji Medina

Abstract: The conventional way of finding the closest pair of points is the use of brute force method that simply compute the distances of all pair of points in the plane and find the points with the minimum distance. An improved version of this method was the use of divide and conquer algorithm. However, the expedition for improving the computational cost of this problem continue to grow because of potential applications in location estimation and sequence matching. This paper attempted to develop and analyze a new method called closest coordinate scheme to determine the estimated position for indoor positioning system. The enhanced fingerprint localization technique was linked with the closest coordinate scheme to test its value in terms of accuracy and efficiency. Results showed that the closest coordinate scheme is efficient and accurate. Future endeavor may focus on the time and space complexities of closest coordinate scheme and find out similar applications.

[Full Text](#)

Title: Shear strength assessment of self-compacting concrete beams using lasso regression technique

Author (s): Jack Banahene Osei, Oklu Joshua and Mark Adom-Asamoah

Abstract: Existing code provisions for shear strength prediction of self-compacting concrete (SCC) beams have often fallen short of its degree of predictability in relation to experimental responses. The research study seeks to develop a model that better predicts the shear capacity of self-compacted concrete beams without shear reinforcement. In addition, the critical parameters that influence the shear strength of an SCC beam was also investigated by using varying regression techniques (Linear, Stepwise, Lasso, Ridge and Elastic Net regressions). A pooled database having a total of 179 SCC beams without shear reinforcement was compiled for the analysis. The Lasso regression was the most effective from statistical analysis having the least relative and mean squared errors. In comparison with existing codes: ACI 318-08, AASHTOLRFD Bridge Design Specification-2007, Eurocode 2 and BS8110, the Lasso model performed better with least mean percentage error (12.23%), least average safety factor(1.1012) and the least coefficient of variation(0.159). The Lasso model also showed that compressive strength, height, breadth, depth of beam, shear span to depth ratio, longitudinal reinforcement ratio, maximum aggregate size and fine to coarse aggregate ratio were all relevant parameters in shear strength prediction of SCC beams without stirrups.

[Full Text](#)

Title: Calculation of absorption and emission of thermal radiation by clouds cover

Author (s): Zainab M. Abbood and Osama T. Al-Taai

Abstract: A clouds are one of the most principal elements in the energy balance which are played a significant role in the absorption and emission of thermal radiation. Data are taken by temperature, dew point, atmospheric pressure and height from satellites recorded by the European Centre for Medium- Range Weather Forecasts (ECMWF) for height (32-26509.7) meter the levels of pressure (1000-20) hpa, the choice of the characteristic day (12/2, 12/8, 12/14, 12/19, 12/22, 1/2, 1/8, 1/14, 1/19, 1/22, 2/2, 2/8, 2/14, 2/19, 2/22) of year 2016 over Baghdad station (33.375°N-44.375°E). Otherwise, we have studied long-wave radiation absorbed and emitted by clouds within certain wavelengths during hourly mean 00-12 times and a cycle in temperature variation. So, classified the clouds according to the cloud thickness and pressure levels as well as we studied the relationship between the cloud water content and the absorbance and relationship between the saturated vapor density and the emissivity. The results showed that absorption and emission depend on the cloud thickness, the cloud water content, saturated vapor density, cloud location and wavelengths, where the higher clouds absorption lead to clouds emission higher during hourly mean 00-12 time.

[Full Text](#)

Title: Investigation of factors influence on post web buckling of castellated beams with intermediates plate

Author (s): Jaffar Ahmed Kadim

Abstract: This paper focuses with the investigation of the factors affecting the post web buckling of castellated beams with intermediate plate in which the analytical results of thirty castellated beams cases were summarized for this purposes study. This research aims to find the effect of main factors that controlled the buckling behavior of castellated beams. These factors include the cutting angle (45°, 60°, 90°), the increment plate height (0,50,100,150,200) mm, the element formulation (thin and thick shell), and finally the loading conditions (shear force, bending moment). The SAP 2000 software was applied to find the buckling load factor by using four nodes shell element to represent the castellated beam sections web and flange. The obtained results showed that the thick element type formulation gave higher values by range 10% to 15% according to the cutting angle and the ultimate buckling shear and moment forces decrease with increasing the intermediate plate height by a nonlinear amount so that the cutting angle 60 ° gives the higher shear section shear capacity and values 90° gives higher section moment capacity. Also, 12 regression models had been developed between the reduction buckling section capacity and the intermediate plate height ratio. In addition, the effect of the intermediate plate height changes the mode of buckling failure from combined tee-web failure to web portion. Finally, the plate height increases causing shifting down the domain of interaction diagram of shear force and bending moment without changing its shape.

[Full Text](#)

Title: Tropical climate effect of hydrophobicity and surface leakage current on electrical insulation materials (Silicone Rubber and Fly Ash)

Author (s): Salama Manjang, Ikhlas Kitta, Gassing, Stephe Walukow Christiono and Riski Pratama

Abstract: Based on research conducted by I. Kitta, et al. (2016), it has been known that the addition of fly ash filler in silicone rubber can increase the dielectric and mechanical strength of the material. In this paper, we are doing further study about the feasibility of the composite material in terms of use in tropical climate. The purpose of this study is to investigate the influence of tropical climate and high voltage on changes in the contact angle and leakage current of composite silicone rubber (silicone rubber and fly ash). The results obtained showed that the largest decline in the contact angles occurred in silicone rubber material that is not given filler fly ash, the smallest decrease in the contact angle occurred in silicone rubber with high levels of fly ash as much as 30%. In observation of surface leakage current similar things happen, namely an increase in leakage current is highest in the silicone rubber material without filler, with increased surface leakage current is lowest at silicone rubber material with fly ash content of 30%.

[Full Text](#)

Title: Study of strata movement based upon developed Roof Fall Warning Index during final extractions in underground coal mining under easily cavable roof formations

Author (s): Jena S. K., Lokhande R. D., Pradhan M. and Kumar N.

Abstract: Roof strata tend to have sagging effect due to gravity loading, in the zone of extraction under bord and pillar underground coal mining with caving, with subsequent development of mining induced stress which keeps on increasing gradually with extractions. Such induced stress may influence workings as dynamic loading effect, posing as a threat to stability of working geometries. In general, when the cavable roof strata are considerably weak in formations, such loading effect remains within the goaved out area, resulting to a safer caving scenario. But, under such situation, presence of any weaker working geometries nearby, such as rib extraction zone, geologically disturbed places etc. may attract the dynamic load to get released with possibilities of sudden premature strata failures. The effective preventive measure for such adverse situation is to go for proper study of strata movement to predict / apprehend the peak limits, so that suitable control measures including roof & side support actions may be actuated. This is a study for analysis of strata behavior under weak roof formations during depillaring with caving and predicting / apprehending the safe limits of strata movement by working over the 'Roof Fall Warning Index', already developed by the principal author. For the study, information were used on different main falls from the depillaring panels of two different underground coal mines with weak and easily cavable roof strata.

[Full Text](#)

Title: Development of a real-time microcomputer-based data acquisition system for a very low frequency (VLF) monitor for space weather studies

Author (s): April Jem H. Saccuan, Reynalin B. Deveza, Shawn Michael L. Lamod, Jocelyn F. Villaverde and Ernest P. Macalalad

Abstract: Ionosphere is the region in the atmosphere where ionization takes place. Its structure varies by altitude, time, and other solar or cosmic activities that affect the propagation of radio signals. Variations in the signal strengths of very low frequency signals as a result of ionospheric changes is a way to measure changes and disturbances in the ionosphere. Stanford University developed a VLF based monitor called SuperSID for monitoring changes within the ionosphere. In this project, an enhanced version of the SuperSID software was introduced, which includes a real-time visualization of signal strength versus time plot for the current day; and a plot function for a quiet day curve. The constructed microcomputer-based data acquisition system was validated using another SuperSID monitor from Stanford. Both are stationed in Manila, Philippines and are configured to monitor NWC (19.8 kHz) and NDT (22.2 kHz) transmitters. A statistical test was performed to validate the association between the monitors and resulted with an average correlation coefficient of 0.958 and 0.948 for NWC and NDT transmitters. Also, a successful characterization of solar flare and thunderstorm was done using an enhancement algorithm.

[Full Text](#)

Title: Current follower approach based PI and fuzzy logic controllers for BLDC motor drive system fed from CUK converter

Author (s): N. Mohanraj and R. Sankaran

Abstract: This paper presents two controllers for implementing the current multiplier approach over a wide range of speed control of a Brushless DC (BLDC) Motor drive system as a cost effective low-power solution. A CUK converter at the front end feeds the DC bus of the Voltage Source Inverter (VSI), where, closed loop duty ratio control of the converter results in variable DC bus voltage, enabling close matching of the reference speed setting. Two alternate controller configurations viz. PI controller and fuzzy controller are introduced for generating gate trigger signals for the power MOSFET switch of the converter. Comparison of performance covering a over a wide range of operating speed of the entire system using PI/FUZZY controllers is carried out by simulation in MATLAB/Simulink platform.

[Full Text](#)

Title: Comparison of derived indices and unsupervised classification for AL-Razaza Lake dehydration extent using multi-temporal satellite data and remote sensing analysis

Author (s): Hayder Dibs

Abstract: Al-Razaza Lake is one of the biggest lake in Iraq, and it is considered as a sources of wealth of fish, and flood water retention. The lake suffered from dehydration extent in during the last three decades. In this study; we propose a method to monitor and detect the changes of AL-Razaza Lake in the course of the time between 1992–2018 using time series of Land sat satellite images. In this study different stages of processing and analyzing, noise removal were performed. In doing so, the applicability of different satellite derived indices including normalized difference water index and normalized difference vegetation index were investigated for the extraction of Lake surface water. An unsupervised (K-Means) classification was applied. The results showed that AL-Razaza Lake has been changed rapidly. Two noticeable results show the rapidly decreasing in the Lake area using NDWIs and NDVIs by 81.17% and 79.69% with area about 1187.40 km² and 1189.24 km² respectively. Unfortunately all the dehydration extended areas were replaced by soil, threat the biodiversity and wildlife in this Lake, and left the Lake suffering more for near future.

[Full Text](#)

Title: Relevance of constant intensity distribution to contouring reflecting plates with Intensity Integration Technique

Author (s): A. Vijaya and G. Subramanian

Abstract: Intensity Integration Technique (IIT) is an image correlation technique to contour mirror-like reflective surfaces. In the case of one-dimensional surfaces, curvature at any point on it can be expressed in terms of the ratio of reflected intensities from it from two (load, unload) states of the surface. As a consequence, it is shown, that if and when one of the reflected intensity distributions is uniform (constant), the reflected intensity value of the other at every point represents curvature to some scale. For now, as constant intensity distributions are not feasible, a viable equivalent is proposed and the hypothesis verified experimentally.

[Full Text](#)

Title: Control of dissolved oxygen in water for intensive tilapia culture using IoT

Author (s): Jesus D. Quintero-Polanco, Martin D. Bravo-Obando and Julian Molina-Mosquera

Abstract: This article presents the design of a prototype for the monitoring, recording and control of the most representative physicochemical variables in fish farming such as dissolved oxygen, temperature and pH in a tilapia culture. This in order to optimize the living conditions of this fish species and counteract the negative effects such as increased mortality in the production process. For this, the system has a temperature sensor DS18B20, a commercial sensor for pH measurement SEN0161 and a dissolved oxygen detector of the company Atlas Scientific. These will be responsible for obtaining the respective values in real time of each of the physicochemical variables. The system also has a control stage managed by a simple plate computer or commonly known as Raspberry Pi, which fulfills the task of acquiring all the information. The prototype also has a local application developed in Qt Designer whose objective is to act as a graphical interface for the visualization and constant monitoring of the measurements made by each of the sensors. Also it has a server that stores and organizes remotely on a page web all the information obtained so that the user has easy access and can monitor in real time the tanks with tilapia.

[Full Text](#)

Title: Optimization of the meteorological station in the experimental farm of the Surcolombiana University

Author (s): Ervin Aranda-Aranda, Diego F. Sendoya-Losada and Jesus D. Quintero-Polanco

Abstract: The article presents the construction of an electronic system for the experimental farm of the Surcolombiana University, which allows the capture, transmission and processing of the following variables: temperature, atmospheric pressure, relative humidity, soil moisture, precipitation, radiation, speed and direction of the wind; in real time regardless of the distance where the weather station is located, which allows detailed access of all the variables through a web page (<http://estacionusco.xyz/>) and which can be seen by anyone for the development of statistical studies related to climate and new projects. The system is the basis for making a mobile station in order to have global information in different points or desired areas.

[Full Text](#)

Title: A wide bandwidth element of solar reflectarray antenna with scanning ability

Author (s): A. Selamat, M. Ramli, N. Misran, M. F. Mansor and S. H. Zaidi

Abstract: A simple solar cell integrated with a triangular loop shape element of reflectarray antenna is presented in this paper. The triangular loop shape element is varied in size to get the required phase range and bandwidth. A wide bandwidth range over 15% has been achieved. Furthermore, a 3 x 3 element reflectarray is then formed with 20° scattering angle. A prototype of the solar reflectarray cell was fabricated and measured. The measured results show good agreement with simulation. The element is designed to be operated at Ku-band frequency and formed a solar reflectarray antenna used for terrestrial applications.

[Full Text](#)

Title: An efficient FBMC based modulation for future wireless communications

Author (s): Kommabatla Mahender, Tipparti Anil Kumar and K. S. Ramesh

Abstract: This paper proposes of implementing a diminished DFT (d-DFT) precoded Filter bank multicarrier (FBMC). We develop an efficient precoding method using d-DFT by combining with one-tap scaling. This technique has advantages of both FBMC-Offset Quadrature amplitude modulation (OQAM) and Single carrier Frequency division multiple accesses (SC-

FDMA). Proposed technique has same PAPR as SC-FDMA and has very low out-of-band emissions and does not need cyclic-prefix. This method reduces latency and complex orthogonality is restored at a considerable computational complexity. A comparative performance is also evaluated between d-DFT-FBMC and other multicarrier schemes and we observe that d-DFT is better than other schemes. Simulation is performed by using Matlab.

[Full Text](#)

Title: Quantification the effect of mangrove coverage on the production of Red Snapper (*Lutjanus malabaricus*) in the coastal area Central Java

Author (s): Sri Puryono, Muhammad Zainuri, Suryanti Suryanti, Rini Budi Hastuti and Sakina Rosellasari

Abstract: Mangrove is an important ecosystem which supports fish resources diversity and abundance. However, it's impact on the economically important fish such as Red Snapper is not well understood. This research aimed to study the fluctuation of Red Snapper yields, study the dynamic of mangrove coverage and its condition, and analyze the effect of mangrove dynamic to the yield of red snapper in the northern coastal area of Central Java. The research was conducted from November 2017 to February 2018, while the northern coastal area of central java was selected as the area of interest. Data collection was conducted by literature study in the Fisheries and Marine Services of Central Java to obtain data of mangrove condition (good, moderate, poor) and coverage and catch of Red Snapper. The primary data utilized in this research were obtained from the Statistics Book of Marine, Coastal and Small Islands and the Statistic Book of Capture Fisheries between 2009 and 2016. Data analysis was conducted by regression through weighting of mangrove condition. The result showed that the yield of Red Snapper was fluctuated ranging from 508.5 tons to 4,242.9 tons. There were also fluctuations on the mangrove coverage's based on its conditions ranging from 9,844.8 to 12,877.0 ha. Regression analysis showed that weighted mangrove coverage has significant negative impact on the yield of Red Snapper in the northern coastal area of Central Java. The best estimator for the relationship was power regression model, with the equation $\ln(y) = 4.08.e40 - 9.58.\ln(x)$ and determination coefficient of 61.3%.

[Full Text](#)

Title: DFT study on electronic structure and band decomposed charge density of the small rings zigzag boron nitride nanotubes

Author (s): Riri Jonuarti, Triati Dewi Kencana Wungu, Freddy Haryanto and Suprijadi

Abstract: The small ring zigzag boron nitride nanotubes (BNNTs) which have a diameter less than 1 nm, possess the different characteristics from other BNNTs that make the small rings zigzag BNNTs are an interesting topic to be investigated. So that, in this study, we report the electronic structure of zigzag BNNTs consisted the stability and the band structure of zigzag forms under various chirality. We also verify the band decomposed charge density around the Fermi level to visualize the partially occupied valence bands and unoccupied conduction bands. The local density approximation (LDA) within the density functional theory (DFT) has been applied in our calculations. We find that the stability of nanotubes will increase as the diameter increases. We found that the increasing integer of n in chiral vectors for zigzag $(n, 0)$ will increase the zigzag BNNTs band gap. The band decomposed charge density depicts that valence maximum band (VMB) is mainly located at the nitrogen atoms. While, conduction minimum band (CMB) is uniformly located at nitrogen and boron atoms. The band decomposed charge density also shows an overlapping occurred inside nanotube. The results confirm that a BNNT narrow band gap can be generated by the small rings zigzag form.

[Full Text](#)

Title: Damage detection using Laplacian operator on interpolated mode shape curvature

Author (s): Fawazi N., Hasrizam C. M. and Hafiz Amran

Abstract: In this paper, a mode shape curvature based damage detection algorithm for estimating damage location in a beam is presented. The computational modal analysis is used to obtain the natural frequencies and the mode shapes for both undamaged and damaged structure. The Laplacian difference equation is used to estimate the difference of the calculated mode shapes. Considering the limited number of possible measured points during the modal analysis, Akima's interpolation is used. This is to estimate the mode shape displacements at the unmeasured positions which are a challenging problem for crack detection using mode shape data. The Gaussian wavelet for one-dimensional problem is used in this study which leads to a clear visualization of the position of the damaged structure.

[Full Text](#)

Title: Aes-Present: A new secure Iot-based scheme for telemedicine and E-health systems

Author (s): Abdellaoui Abderrahim, Fdili Ibtissam, Chaoui Habiba, El Achgar Hicham and Hmina Nabil

Abstract: Over the last few years, the Internet of things has gained more and more space in various activities sectors, including the health sector. In fact, the Telemedicine has benefited from this new concept by using its various kinds of special devices and tools which facilitate to provide distance healthcare services, and thus, solve many problems notably for the elderly or person in remote areas. However, the transfer of sensitive medical data is threatened by falsification, while its security and privacy are crucial in healthcare. The main contribution of this paper is to propose a secure telemedicine scheme that supports different types of medical data. The scheme ensures, on the one hand, communication confidentiality by means of a combination between heavyweight and lightweight cryptography, and on the other hand, data integrity by using network steganography and the cryptographic hash function RIPMD160.

[Full Text](#)

Title: The performance of power control method on macrocell-femtocell LTE heterogeneous networks

Author (s): Azita Laily Yusof, Nurnasihah Md Wazali, Norsuzila Ya'acob and Darmawaty Mohd Ali

Abstract: In telecommunications, femtocell technology has been introduced to improve indoor coverage and capacity. Femtocell is a small, low-power cellular base station deployed to offer better good services with low cost as it reduces the transmitted power. It is also designed to offload the traffic in macrocell to the femtocell network. However, the unplanned deployment of femtocells and their uncoordinated operations may result severe interference conditions

among the femtocells and between macrocells and femtocells. In this paper, power control techniques has been proposed at the base stations to mitigate interference and increase the network capacity. Power control equation is applied at the base stations for both outdoor macrocell users and indoor femtocell users, and a framework is developed by using the MATLAB software to analyze the signal performance. From the results obtained, this proposed technique has increased number of successful handover and hence, can effectively eliminates co-channel interferences between macrocells and and femtocells in urban and busy area.

[Full Text](#)

Title: Improvement of bus voltages and line losses in power system network through the placement of capacitor and DG using PSO

Author (s): Naji Eltawil, Meysam Shamshiri, Marizan Sulaiman, Zulkiflie Bin Ibrahim and Noor Ropidah

Abstract: The optimum allocation of capacitor banks and Distributed Generation (DG) units are one of the challenges of power network planner and operators in transmission and distribution levels. Capacitors and DG are compensators that can help to power network to reduce the total power losses and improve the voltage profile, but non-optimal allocation of compensators can lead to inverse power flow. This can be caused to raise the voltage at buses out of the statutory limits as well as increasing the system losses due to reverse power flow. The capacitors in power system are generally utilized to supply real reactive power for reducing real power, then as the results improving the voltage profile. Therefore, the appropriate placement and sizing of capacitors are essential to ensure that system can mitigate power loss and improve the voltage profile with respect to all the technical constraints and limits which takes into account as penalty factor and added the objective function of optimum allocation of DG and capacitors. To minimize the obtained objective function, this paper hasutilized Particle Swarm Optimization (PSO) technique to find the optimum location and the size of the units to ensure that can achieve minimum power losses and bets voltage profile. The OpenDSS engine is utilized for performing power flow calculation in an iterative manner for PSO algorithm. The IEEE 14 bus system has been used as a case study in this paper for executing the proposed method and finding the optimum solution for DG and capacitor allocation. The results of this paper show that proposed method was successful to achieve the target of the objective function and allocate the DG and capacitors into the best optimum location with appropriate size. This paper highlighted that how the existing power network can be improved to be functional in future long-term load growth without the huge investments of the network reinforcement. The results show that by allocating the DG units and capacitors the existing network can supply the good power quality to the end receiving buses, even with a better voltage profile and less total power losses in the overall network.

[Full Text](#)

Title: Evaluation of thermal phase shift from the curve of temperature of a kapok-platter material in dynamic frequential regime

Author (s): Dame Diao, M. S. Ould Brahim, Hawa Ly Diallo, Youssou Traore, Pape Touty Traore, Seydou Faye, Issa Diagne and Gregoire Sissoko

Abstract: In this article, we study the thermal phase shift of a thermal insulating material based on kapok-plaster in dynamic frequency regime. The method of determining this phase shift consists in evaluating the delay of the signal of the temperature between the front and rear faces of the material for a given excitation pulse as a function of time. The study of the influence of the pulse is also evaluated.

[Full Text](#)

Title: Arduino utilized for dynamic automatic security locker system

Author (s): Bahaa Hussein Taher, Muhanad Mohammed Kadum and Mohammed Abduraheem Fadhel

Abstract: Benefit Due to the pressing demand for the safe storage in public areas, Increase the number of people applying these services in substantial life, such as the Holy shrines, Institutions, Airports and building office, In view of the traditional methods of the lockers to save a package, which relies on regular keys that can be stolen or lost, the higher cost is also used specifically for one user only, This work to solve problems from regular keys and gives a dynamically works multiple usages at the different times, includes electronic locks depends on, a password that create by a user with a lower cost, flexible and easiness, the idea of splitting the password into two parts gives a strong protection in this application, the simulation using some of the electronic parts of the Arduino device to design a dynamic automated digital security system to Apply for Multi cabinet's lockers. It can accept multi-users each period of time while there are some of the cabinets are empty, The cabinet will only unlock if the password matches, and will be erased from the memory automatically to use again; otherwise, the alarm is on.

[Full Text](#)

Title: IA-FEC: Interleaved adaptive forward error correction scheme with efficient packet loss recovery system in cloud computing

Author (s): Benjamin Franklin I. and Ravi T. N.

Abstract: Cloud computing plays an important role in next generation of business enterprises. In traditional method of IT services maintained their data under suitable physical, logical and personnel controls, but in cloud computing large data centers consisting application software and databases, where the organizational data and services may not be fully reliable. This paper focuses on data storage security against packet loss which is most important quality of services for the cloud users. Some existing techniques have been introduced in recent years against packet loss either by associate with retransmission request my cloud users or adding redundant Forward Error Correction (FEC) data. This paper proposes an efficient data encoding method of Interleaving Adaptive-FEC (IA-FEC) method for time sensitivity of data recovery named as Interleaving-A-FEC has been introduced. By use of interleaving technique, the opportunity to recover lost packets can be much improved due to the interleaving characteristics to separate the effect of packet losses. Adaptive-FEC (A-FEC) has the advantages of high redundancy rate with respect to the packet loss, based on the request messages received from the cloud users. This method combined both the advantage of A-FEC and interleaving techniques. The simulation results demonstrate that the proposed IA-FEC method has produced higher recovery rate than traditional FEC method, which is widely being used for internet phone services. The proposed approaches will be more suitable for bursty packet losses with various loss environments.

[Full Text](#)

Title: A critical survey on approximate computing with CMOS and memristors

Author (s): S. Muthulakshmi, A. Sivasubramanian and S. R. S. Prabaharan

Abstract: In the nanoscale era, enhancing the performance of digital circuits and systems becomes increasingly cumbersome. As a result, computing becomes increasingly heavy with multimedia processing. Approximate computing is regarded as one of the emerging technologies that could produce less-than-optimal results which are sufficient enough in user's perspective. This is accomplished by minimizing energy consumption as well as hardware area. The slight compromise in output quality is acceptable for inherent error resilient applications. This paper reviews different types of existing CMOS based approximate circuits designed by various functional approximation techniques. Further, this survey focuses on analyzing the existing approximate arithmetic circuits based on various error metrics such as error rate, error distance, mean error distance, normalized error distance, and minimum acceptable accuracy. The impact of approximation on circuit characteristics for instance, delay, power consumption and throughput are also presented. This paper critically reviews the progress made in the context of approximate computing by using CMOS architecture and its impact on replacing with RRAMs (Memristor). The latter is reportedly found to be energy efficient due to its nano-scale dimension. Although memristor based approximation is still in its infancy, it is high time to understand its emerging importance in nanoscale computing in general and approximate computing in particular.

[Full Text](#)

Title: E-congak: The development of an electronic congkak board game to promote traditional board game to younger Malaysian generation

Author (s): Amir Faqihuddin Hafizan, Amar Faiz Zainal Abidin, Nik Zulfiqar Nik Suhaimi, Muhammad Muzamil Mustam, Firdaus Sukarman, Kamaru Adzha Kadiran, Siti Aliyah Saleh and Rozi Rifin

Abstract: Congkak board game has been a traditional board game played among Malaysian. Unfortunately, like any other traditional games, there is a great decline of interest among younger Malaysia generation due to popularity of multimedia-based games. The objective of this project is to improvise the traditional board game by developing an electronic based board game that gives the interactive element that most multimedia-based games, yet keep the traditional kinesthetic and human element. The project uses Arduino Mega as controller, seven segment displays to indicates number of marbles in each hole, and push button for the user to select which hole to select. A survey consists of six questions was done among the young Malaysians to verify whether the electronic board game is better than the traditional board game. The result indicates that the electronic board game proved to be popular among the young generation.

[Full Text](#)

Title: A hybrid framework for brain TUMOR detection and classification using neural network

Author (s): Shijin Kumar P. S. and Sudhan M. B.

Abstract: Magnetic Resonance Imaging (MRI) has been a robust tool for the diagnosis of brain tumors. MRI is an imaging technique that provides detailed information about brain anatomy. This paper announces a novel method for efficient and accurate MRI analysis. The images are pre-processed to increase the contrast and to remove the skull region. A novel algorithm is used to check whether the given image is normal or not. This algorithm reduces the computational complexity and increase the speed of proposed classification system by selecting abnormal images alone for further processing. Segmentation is performed on abnormal images to find the tumor region. Segmentation is based on a hybrid algorithm using K-means clustering and Texture Pattern Matrix. Texture Features and shape features are separately extracted from the segmented binary image using Gray Level Co-occurrence Matrix (GLCM) and connected regions. The features thus obtained are used to train the neural network using Back Propagation Algorithm defined by Levenberg-Marquardt (LM) algorithm. Feed Forward Neural Network (FFNN) is used for the classification of MR images. While using the proposed method, accuracy is 98.06%, specificity is 97.77% and sensitivity is 98.34%. Speed, Robustness and computational complexity are the major advantages of the proposed system.

[Full Text](#)

Title: New design for dynamic pressure calibration system

Author (s): Shaker A. Gelany, T. A. Osman, A. M. Abouel-Fotouh, Alaaeldin A. Eltawil and Bassam A. Hussein

Abstract: Dynamic pressure sensors calibration and their traceability is a new metrology field. Since such dynamic measurements are essential in the design and development of modern engines, and many industrial applications. It is necessary to establish national Egyptian standard for dynamic pressure measurements which can provide traceability to the industry. This paper presents a new design for dynamic pressure calibration machine. The main idea of this machine depends on generating an impulse pressure signal applied to both the sensors under calibration and a reference sensor. The machine is fully automated using LabVIEW software; the machine linearity and the repeatability are tested.

[Full Text](#)

Title: Hydrate: Real menace to flow assurance

Author (s): Anyadiegwu Charley Iyke C., Ohia N. P. and Muonagor Chukwuemeka M.

Abstract: The effect of hydrate formation on flow was evaluated. Orifice Flow equation was applied to compute the flow rates of Gas Stream A through the orifice before hydrate formation and after hydrate formation. From the computations and Figure-3.1, it is seen that hydrate formation reduces the amount of flow through the orifice. The flow rate through the orifice before hydrate formation was 2465829.4scf/hr but after hydrate of about 2.25" thickness was formed the flow rate reduced to 668146.4scf/hr. Also, from Figure-3.1, as the thickness of the hydrate increases, the flow rate of gas through the orifice decreases.

[Full Text](#)

Title: Synthesis of NI(II)-TI(IV) layered double hydroxides using coprecipitation at high supersaturation method

Author (s): Solovov V. A., Nikolenko N. V., Kovalenko V. L., Kotok V. A., Burkov A.?, Kondrat'ev D. A., Chernova O. V. and Zhukovin S. V.

Abstract: The aim of the work was to prepare Ni(II)-Ti(IV) layered double hydroxides using coprecipitation at high supersaturation method, which has not been reported yet. The samples were prepared using coprecipitation at high supersaturation, by adding mixed salt (Ni²⁺+Ti⁴⁺) solution to NaOH+Na₂CO₃ solution. The prepared samples were characterized using X-ray Diffraction (XRD), Scanning Electron Microscopy (SEM), Thermogravimetric analysis(TG) and Differential Scanning Calorimetry. The results of XRD analysis has confirmed that prepared samples have hydroxalcite-like structure, isomorphous to a-Ni(OH)₂. Separate titanium oxide or hydroxide phase was not observed. The influence of synthesis temperature and hydrothermal treatment on phase composition, morphology, and thermal stability has been studied using TG, DSC, and SEM. It has been established that elevated synthesis temperature and hydrothermal affect crystallinity, thermal stability and morphology, but no effect on phase composition was observed. A formation mechanism of Ni(II)-Ti(IV) layered double hydroxide during coprecipitation at high supersaturation have been proposed.

[Full Text](#)

Title: Methods of ECG-Signal transmission system development

Author (s): Viktor Ivel, Yuliya Gerasimova, Sayat Moldakhmetov and Pavel Petrov

Abstract: The article concerns the concept of medical cardiadiagnostical automated systems based on wireless technologies, Matlab application package and ECS PhysioBank ATM database. This article considers the principles of Holter monitoring systems to be used at home. It describes the methods of application of electrocardiographic signals archive for debugging and setting up of the system developed. The undertaken study showed that the proposed methods shall create effective systems of daily cardiac activity monitoring characterized by high speed and low energy consumption.

[Full Text](#)

Title: Prosthetic hand control using wearable gesture armband based on surface electromyography

Author (s): Abd Al-Sahib N. Kadhim, Muhammed Abdulsattar and Abu shanah R. Waleed

Abstract: Surface electromyography is a technology that provides detection of electrical activity produced by the physiological contractions of muscles; the sEMG is widely applied in medical assistive applications such as gesture control for upper limb prosthetics. Nowadays, there are many useful devices for innovative and new medical technologies in health care. Myo armband is an example for these devices which can be used for many applications in computer, mobiles and gaming system. In this paper the control of prosthetic hand of 3DOF in each finger via wearable MYO armband communicates wireless with the Arduino microcontroller via Bluetooth piece. The MYO armband has eight electromyography (EMG) sensors for collecting bioelectric signals from different parts of the forearm muscle; Myo armband is a wearable gesture and motion control device that uses a set of electromyography sensors, combined with a gyroscope, accelerometer and magnetometer to detect movements and gestures, the test was done on a healthy person and an amputee person .In this work another sensor was used the FSR sensor to make the prosthetic hand smart when touching specific object this feature made the prosthetic hand intelligent.

[Full Text](#)

Title: Risks response failure in construction projects

Author (s): Hafeth I. Naji, Ehsan Ali Al-Zubaidi and Rouwaida Hussein Ali

Abstract: This paper aims to identify the risk response failure in a construction project in the periods in the periods between 2006 to 2013 and identify the techniques that use to predict the failure in the construction projects in the periods of 2014 to 2016 and select the technique with high accuracy. The methodology of the paper include two part, questionnaire and the use of data mining techniques. The questionnaire was distributed to the owners, the contractor and other parties involved in the project, 41 projects were taken and the questionnaire was distributed to 15 people who work in the project. The questionnaire includes the strategies for each risk and five measurements were used which are too low, low, medium, high and too high The second stage include the use of data mining techniques which are decision tree, neural network and support vector machine ,the period from 2006-2013 as training set to predict the failure of 2014-2016 projects. The program that use is KNIME (pronounced /naIm/), the Konstanz Information Miner, is data analytics with an open source, reporting and integration platform. All the project face failure in construction projects, at this stage doesn't receive much attention in the projects that lead to the failure. The decision tree shows the highest accuracy and that because it considers the best algorithm in prediction of nominal class. This study is the only one made in identifying the risk response failure in construction projects First, we have identified the risk in the construction project in different periods, the identified the risk response for each risk, finally we determine the risk response failure in construction projects.

[Full Text](#)

Title: Effect of evaporation time on physical and chemical properties of aloe vera gel extract (Aloe Chinensis Baker)

Author (s): Tri Yuni Hendrawati, Ratri Ariatmi Nugrahani, Suratmin Utomo and Anwar Ilmar Ramadhan

Abstract: Aloe vera gel can be used as raw material for medicine and pharmaceutical preparations by reducing the water content. By reducing the water content is expected to increase the levels of beneficial substances. Evaporation used is vacuum evaporator with maximum temperature 60oC. The purpose of this research is to estimate the time of evaporation to the properties of the Aloe vera extract gel. Evaporation of Aloe vera gel is done at 60oC and pressure 72 mbar. Evaporation time is varied at 30, 60, 90 and 120 minutes. At each evaporation time pH, density, refractive index and vitamin C. Vitamin C analysis using HPLC method with ascorbic acid standard. In the pH test, pH ranges from 4.5 to 4.3 at 120 minutes. The refractive index increases because of the longer evaporation time the higher the viscosity and the color closer to the yellow green. The density values ranged from 0.945 g / ml at 30 minutes and 1.0056 g / ml at 120 minutes. For the best vitamin C levels obtained at evaporation time of 120 minutes at 4.1 ppm. In this evaporation condition means vitamin C can be maintained.

[Full Text](#)

Title: Using a statistic approach: An application for assessing concentrations of air pollutants

Author (s): Souad Laaroussi, Taoufik Cherradi, Soulhi Aziz and Rabiae Saidi

Abstract: In today's cities management, the primary challenges facing local decision-makers are climate change, population growth, pollution and the rising costs of energy. It must be noted that air pollution is one of the most complex ecological problems that the aformationed decision-makers have to deal with nowadays. Given the limited financial means of most municipalities, the primary objective of this paper is to provide a less costly decision support model for the assessment of air pollutant concentrations, particularly SO₂. The Six Sigma approach, in its "analysis" section, allows the evaluation of the daily average of SO₂ concentrations measured during the period of one year in the city of Kenitra / Morocco. The application of statistical tests helps assess the conformity of this pollutant with the value limit required by the Moroccan standards for the protection of the environment.

[Full Text](#)

Title: A systematic mapping study of high performance computing and the Cloud

Author (s): Isaac Odun-Ayo, Rowland Goddy-Worlu, Olasupo O. Ajayi and Emanuel Grant

Abstract: Cloud computing is a paradigm that provides resources in an almost limitless way to users. High Performance Computing (HPC) involves performing computationally intense processes rapidly. Cloud computing being scalable and comparatively cheaper has the capacity to offer such processing speed, hence HPC are often deployed in the Cloud. However, determining a focus of research in a particular field of study is sometimes challenging especially in the area of HPC and the cloud. A systematic mapping study examines the various research work carried out in given area, summarizes these work and provides a visual representation of the results in form of maps. The method utilized in this study involved analysis on three categories namely, topics, research and contribution facets. Topics were extracted from primary studies, while research type such as evaluation and contribution such as tool were utilized in the analysis. The objective of this paper therefore was to conduct a systematic mapping study of HPC and the Cloud. The results showed that there were more publications in terms of performances in the aspect of metric with 2.88%, and more publications on applications relating to tool, model and method with 26.73%, 18.27% and 12.5% respectively. Furthermore, there were more publications on optimization in terms of process with 5.77%. In addition, there were more articles on applications based on evaluation and validation research with 18.1% and 6.9% respectively. Publications on optimization in terms of solution research accounted for 6.9%, while articles on design and implementation that relates to philosophical research were 3.45%. The outcome of this study identified several gaps that will be of benefit to researchers, practitioners and providers.

[Full Text](#)

Title: Byte-invert transmission for flicker prevention and illumination control for visible light communication

Author (s): Seong-Ho Lee

Abstract: In this paper, we introduce a new method, byte-invert transmission, for preventing LED flicker and controlling illumination in visible light communication (VLC). In byte-invert transmission, each data byte is sent in sequence with its inverted version. The inverted byte is an eight-bit data whose bits have been changed to the opposite state of their original value. In this configuration, the average power of the LED light is kept constant regardless of data change, keeping it flicker-free, and the illumination is controlled by changing the duty factor of the return-to-zero (RZ) data waveform. In experiments, the LED optical power was varied from 4.5% to 45% of its DC value by changing the duty factor from 10% to 100%.

[Full Text](#)

Title: Preparation bio-lubricant from Catfish fat

Author (s): Hong Thi Tran, Phuoc Vinh Truong and Tan Minh Phan

Abstract: Catfish fat treated to refined Catfish oil (RCfO) by degum, dewax and neutralize. Catfish fat was chemical conversion to ester Catfish oil (ECfO) for the purpose of enhancing the oxidation stability of Catfish fat. Blending bio-lubricant from ECfO and RCfO was constructed base on the 20W-50 engine lubricants formula, replacing mineral base oil as mixture of ECfO and RCfO. The characteristics of material and products were determined by TCVN standard and ASTM standard. Thermo gravimetric analysis (TGA) measurements and Rancimat test were used in determination the oxidation resistance. The biodegradability of samples was analyzed by COD test and BOD test. From the analysis results show that, ECfO and RCfO can used as biobase oil. Blend of ECfO and RCfO in ratio (wt/wt) 75/25 was not only able to meet the characteristics of 20W-50 engine lubricant but also high biodegradability. The preparation of bio-lubricant from Catfish fat can develop sustainably because of using alternative materials and environmentally friendly products.

[Full Text](#)

Title: Mathematical model of the viscous fluid motion caused by the oscillation of a flat porous surface

Author (s): Nikolay Grigoryevich Taktarov, Olga Aleksandrovna Runova and Nadezhda Aleksandrovna Khramova

Abstract: This paper proposes and studies a mathematical model of the motion of a viscous fluid caused by the oscillation of a plane porous surface. The motion of liquid inside and outside of a porous medium is considered in a fixed coordinate system. The porous medium performs harmonic translational-oscillatory motion parallel to an impenetrable flat surface, which limits the porous medium from below and moves with its velocity. Exact analytical solutions of the nonstationary Brinkman equation describing the motion of a liquid in a porous medium and the Navier-Stokes equation describing the motion of a liquid outside of a porous medium are found. A numerical analysis of the proposed mathematical model is carried out. The profiles of filtration rates in a porous medium and free liquid are constructed for different values of the model parameters. It is shown that, in special cases, the previously obtained solutions of problems of the motion of a viscous fluid caused by the vibration of a solid impermeable flat surface follow from the results obtained.

[Full Text](#)

Title: Reduction of environmental optical noise in visible light communication using a Cds cell

Author (s): Seong-Ho Lee

Abstract: In this paper, we introduce a new method to reduce the 120Hz noise arising from other lighting lamps adjacent to the visible light communication (VLC) system. A Cds cell was installed near the photodiode in the VLC receiver, and the Cds cell voltage was subtracted from the photodiode voltage using a differential amplifier. The Cds cell has a receiving bandwidth much lower than the photodiode, and detects the 120 Hz noise, but it does not respond to the high frequency signal light. Thus the differential output of the photodiode with the Cds cell becomes an amplified signal with the noise reduced. The signal-to-noise voltage ratio was improved by about 17.5 dB using a Cds cell in the VLC receiver.

[Full Text](#)

Title: Nonlinearity mitigation in IM/DD optical OFDM using new SLM scheme

Author (s): Chhavi Sharma, Arvind Kumar and S. K. Tomar

Abstract: Optical orthogonal frequency-division multiplexing (O-OFDM) systems have received a great deal of attention as a transmission technology for high-capacity long-haul optical transport networks. However, it is also very sensitive to nonlinear effects due to high peak to average power ratio (PAPR) problem as conventional OFDM system. This paper proposes Fast Hartley based selective mapping with Riemann Sequence for PAPR reduction in IM/DD Optical OFDM system. Results show that the proposed method performs better in terms of PAPR and bit error rate performance and it is less complex than other conventional methods.

[Full Text](#)

Title: Thermal degradation mechanism of Sewage Sludge

Author (s): B. Kamal Batcha and V. Kirubakaran

Abstract: Disposing of Sewage Sludge is the major concern in waste management. Several studies has already been carried out on thermal degradation. Thermogravimetric studies on sewage sludge reveals that the sewage sludge is an ideal bio-residue for gasification process. This paper attempts in arriving mechanism of thermal degradation of sewage sludge. A batch type reactor has been developed and heated externally using an muffle furnace. The product gas has been continuously analyzed and reported. From the gas evolved the rate reaction is arrived and verified.

[Full Text](#)

Title: Characterization and electrical conductivity of ionic oxide Nano films by DC and AC methods

Author (s): S. N. Padhi, K. S. Raghu Ram, A. Sai Neel Kamal, Siva Rama Krishna and B. N. Dhanunjaya Rao

Abstract: We report here the ionic conductivity characteristics of single crystal of Yttria Stabilized Zirconia (YSZ)<100>. The targets of YSZ of one-inch diameter and about 2-3 mm thickness were palletized and sintered in the range of 1000-15000 C for 2-4 hours in air. These targets were polished up to 1000 emery paper cleaned in an ultrasonic bath containing methanol. The ionic conductivity was measured using both AC impedance spectroscopy and DC four probe technique. An idealized plot for the spectrum of a ceramic oxide specimen with particularly blocking electrodes has been studied. The ionic conductivity of ceramic oxide was compared with YSZ <100>.The investigation showed that the advantage of AC method is to separate the bulk, grain boundary and electrode resistance which is not possible by DC method. A single crystal of YSZ<100> was experimented for ionic conductivity. The ionic conductivity and activation energy of YSZ<100> at 973 K were found to be almost same in both DC and AC method which seems to be because of absence of grain boundary.

[Full Text](#)

Title: Oxidation of beverage cans in the temperature range 400-610oc

Author (s): Nukman, Irsyadi Yani, Amir Arifin, Firdaus M. S. and Roberto

Abstract: Thermogravimetric Analyzer (TGA) is a device for carrying out thermal analysis where the mass of the test material will be inversely proportional to or directly proportional to the increased temperature rate and time function. TGA is usually used to determine material characteristics. The increasing mass curve of the element of aluminum material can be used to determine oxidation. The point of rising material mass can be used to calculate activation energy. This study has used a Thermogravimetric Analyzer with aluminum test materials from used beverage cans which are melted directly and indirectly with used lubricating fuels. The test results show that the activation energy for direct furnace casting (DF) is 186.2 J/mol and this is greater than indirect furnace casting (IF) which has an E value 92.17 J/mol. Activation energy for CAN cans is 318.8 J/mol, and for used cans without Ink and Varnish Cw/oIV the activation energy is 350 J/mol.

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Title: Novice retroaction report

Author (s): R. Shiva Shankar, L. V. Srinivas, D. Ravibabu and Raminaidu

Abstract: The Online Student Feedback Analysis System is a web based system which collects the feedback from every individual student and provides an automatic generation of a collective feedback which has been used to collect feedback from the students on the main aspects of course such as preparations, contents, delivery methods, punctual, skills, appreciation, and learning experience. We have developed a feedback system to provide the feedback in an easy and quick manner to any particular department in a college or an educational institute. The feedback is collected in terms of qualitative scores. Recent approaches for feedback mining use manual methods and its focus mostly on the qualitative comments. So the evaluation cannot be made through deeper analysis. Student feedback mining system (SFMS) which applies text analytics and sentiment analysis approach to provide instructors a quantified and deeper analysis of the qualitative feedback from students that will improve the students learning experience. We have collected feedback from the students and then text processing is done to clean the data. Feedback comments about each topic are collected and made as a cluster. Classify the comments using sentiment classifier and apply the visualization techniques to represent the views of students. This proposed system is an efficient approach for providing qualitative feedback for the instructor

that enriches the students learning. With the help of this application, we can give feedback through the online system much faster than the existing paper feedback system. The existing system takes more time to get the feedback from the students, thus the online feedback system is implemented. Students will fill online feedback using a standard form provided online. Special care has been taken to provide the security in the proposed system as only the authentic user is able to see the collective feedback of a batch of the students and can also get to know about the collective opinion. The application of giving the feedback is not only objectively (i.e. rating out of a fixed constant value) but also in subjective manner by leaving their comments and reviews about any particular field or subject. The main objectives of feedback analysis system are the conventional objective analysis as well as Subjective analysis with the help of Sentiment Analysis.

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Title: Design and analysis of a SEPIC converter for PV applications

Author (s): D. Vinodini, S. Hema, S. R. Akshaya and K. Fathima

Abstract: This paper presents analysis and design of a SEPIC Converter. Operation of the single ended primary inductor converter (SEPIC) is analyzed, leading to mathematical expressions that can be used to design the converter. The SEPIC converter allows a range of dc voltage to be adjusted to maintain a constant voltage output. SEPIC converter is used to overcome the limitation of conventional buck boost converter like inverted output, pulsating input current, high voltage stress make it unreliable for wide range of operation. MATLAB simulation is being used to validate the method and show the effectiveness of the design.

[Full Text](#)

Title: Microwave attenuation and phase rotation in sand and dust storms - Part I

Author (s): Abdulwaheed Musa and B. S. Paul

Abstract: Microwave signal propagation may suffer attenuation and phase rotation by suspended particles during sand and dust storms (SDS) in arid and semi-arid regions of Africa and Asia. This development has received considerable interest in recent time. Thus, attenuation and phase rotation induced by SDS were investigated and models for estimating these propagation parameters are presented in this paper. Using Rayleigh method, the models were premised on the complex forward scattering amplitude of dust particles with spherical shape. Three different conditions were tested to proof the suitability of the method used. The results show that the Rayleigh approximation method is suitable and valid in determining scattering effects of dust particles with spherical shape for frequency range and dust particle sizes considered. The microwave (MW) attenuation and phase rotation expressions are proposed as functions of visibility, complex permittivity and wavelength. It was found that attenuation and phase rotation increase with increase in severity of SDS. Also, attenuation in dry dust is only influential at frequency of lower millimetric wave range or when the visibility becomes severe.

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Title: Mathematical model of a hydrodynamic cavitation device used for treatment of food materials

Author (s): Lubov Prokhasko, Oksana Zinina, Maksim Rebezov, Rustem Zalilov, Zhanibek Yessimbekov, Irina Dolmatova, Yuliya Somova, Aleksey Peryatinskiy, Sergey Zotov and Ekaterina Tumbasova

Abstract: The article analyzes the physicochemical effects during cavitation action on the liquid medium. The characteristic of ultrasonic and hydrodynamic cavitation is presented. Particular attention is paid to the use of cavitation technology in the food industry. A review of the latest research is presented showing that hydrodynamic cavitation is not only an alternative to acoustic cavitation for the management of chemical, biochemical, physical processes, but also a priority in the processing of large volumes of liquid process media, which determines its industrial application. A hydrodynamic cavitation device is proposed, the working process of which is fundamentally different from traditional cavitation devices, namely: the formation in the cavitation area of a supersonic flow in a homogeneous two-phase medium, which under conditions of friction of the working chamber (throat) passes into a subsonic flow through a pressure jump. Thus, the cavitation effect on the flow is amplified by the shock action of the pressure jump when the supersonic flow transfers into subsonic flow, which is a powerful intensifying factor at an energetically higher level when the liquid medium is transformed. The working process of a hydrodynamic jet cavitation device and a cavitation device with a hydrodynamic grid is described in detail. A mathematical model is developed for calculating the transverse and longitudinal dimensions of cavitation devices, in the compilation of which, the fundamental laws of conservation of mass and energy, the basic equations of hydrogasdynamics in their generally accepted mathematical form, and reliable semi empirical data are used.

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QUANTIFICATION THE EFFECT OF MANGROVE COVERAGE ON THE PRODUCTION OF RED SNAPPER (*Lutjanus malabaricus*) IN THE COASTAL AREA CENTRAL JAVA

Sri Puryono¹, Muhammad Zainuri², Suryanti Suryanti², Rini Budi Hastuti³ and Sakina Rosellasari⁴

¹Regional Secretary, Province of Central Java, Indonesia

²Faculty of Fisheries and Marine Science, Diponegoro University Semarang, Indonesia

³Faculty of Science and Mathematics, Diponegoro University Semarang, Indonesia

⁴Marine and Fisheries Service, Province of Central Java, Indonesia

E-Mail: spuryonodr@gmail.com

ABSTRACT

Mangrove is an important ecosystem which supports fish resources diversity and abundance. However, it's impact on the economically important fish such as Red Snapper is not well understood. This research aimed to study the fluctuation of Red Snapper yields, study the dynamic of mangrove coverage and its condition, and analyze the effect of mangrove dynamic to the yield of red snapper in the northern coastal area of Central Java. The research was conducted from November 2017 to February 2018, while the northern coastal area of central Java was selected as the area of interest. Data collection was conducted by literature study in the Fisheries and Marine Services of Central Java to obtain data of mangrove condition (good, moderate, poor) and coverage and catch of Red Snapper. The primary data utilized in this research were obtained from the Statistics Book of Marine, Coastal and Small Islands and the Statistic Book of Capture Fisheries between 2009 and 2016. Data analysis was conducted by regression through weighting of mangrove condition. The result showed that the yield of Red Snapper was fluctuated ranging from 508.5 tons to 4,242.9 tons. There were also fluctuations on the mangrove coverages based on its conditions ranging from 9,844.8 to 12,877.0 ha. Regression analysis showed that weighted mangrove coverage has significant negative impact on the yield of Red Snapper in the northern coastal area of Central Java. The best estimator for the relationship was power regression model, with the equation $\ln(y) = 4.08.e^{40} - 9.58.\ln(x)$ and determination coefficient of 61.3%.

Keywords: mangrove, power regression, red snapper, weighted, yield.

INTRODUCTION

Fish is one of the renewable resources. However, the renewability of fish stock is limited (Lindegren, Diekmann, & Möllmann, 2010), while the exploitation tends to increase overtimes. Fish stocks in the coastal area are dynamic resource which fluctuates among times and places (Rouyer *et al.*, 2011). However, the dynamics is strongly related to the ecological aspects. In the coastal area, there are several ecosystems which support fish resources which act as temporary habitat or permanent habitat, such as coral reefs, seagrass beds, mangrove, estuaries and sand. Some fish species are migratory, move between ecosystems to complete the life cycle (Hammerschlag-Peyer & Layman, 2010). The movements are generally driven by the availability of appropriate food. Even though a fish species inhabits certain ecosystem, but it may also dependent to another ecosystem. Thus, the condition of the ecosystem plays important role to support the sustainability of fish biodiversity and stock abundance in the coastal area.

Among the known coastal ecosystems, mangrove ecosystem has important role in supporting the biodiversity of coastal area, especially fish stocks and resources (Zakaria & Rajpar, 2015). Some fish species are dependent to mangrove ecosystem. The spawning, nursery and feeding of some fish species occurs in the mangrove ecosystem (Auliyah & Blongkod, 2018; Lapolo, Utina, & Baderan, 2018). Fish migrates from or to mangrove ecosystem to accomplish its life cycle (Nyanti, Nur

Asikin, Ling, & Jongkar, 2012; Sihombing, Gunawan, & Sawitri, 2017). Thus, mangrove ecosystem plays important role in the process of fish restocking. Any disturbances on mangrove ecosystem may affect the capability of mangrove in supporting the fish resources and further impact the abundance of fish biodiversity and stock in the coastal area.

Mangrove ecosystem provides goods and services for the fish community. Known mangrove services include: the improvement of water quality, remediation of pollutant, nutrient recycling, shelter, protection, and provision of complex food webs (MacKenzie & Cormier, 2012; Mendoza-Carranza, Hoeninghaus, Garcia, & Romero-Rodriguez, 2010; Rahman *et al.*, 2013). However, the role of mangrove in nutrient recycling is the dominant process which promotes the biodiversity in the mangrove ecosystem (Lucy G. Gillis, Bouma, Cathalot, Ziegler, & Herman, 2015). Nutrient recycling involves various organisms, provides nutrient for plankton as primary producer of aquatic ecosystem (Saifullah, Kamal, Idris, Rajae, & Bhuiyan, 2016; Shoaib, Burhan, Shafique, Jabeen, & Siddique, 2017). Thus, more organism with higher trophic level gathered in the mangrove ecosystem.

Red snapper is one of the precious fishing target in many regions (Baharudin, 2013). Thus, it is considered as an economically important fish species. Currently, the price of Red Snapper is ranging from Rp. 45,000 to Rp. 70,000 /kg (Rikza, Asriyanto, & Yulianto, 2013). Generally, Red Snapper is caught by artisanal fisheries.



Fishing activities of Red Snapper occurs in the coral ecosystem. Thus, only small boats could be used to access the fishing ground. The economic importance of Red Snapper is recently increased due to its expanded market potential (Rikza et al., 2013). The demand of fish production is increased for export activity. Unfortunately, the intensive fishing effort on Red Snapper stocks has caused overfishing in many regions / countries (Black, Allman, Schroeder, & Schirripa, 2011; Cowan *et al.*, 2011; Lukman, 2012).

Red snapper (*Lutjanus* sp.) is one of fish species which inhabit coastal waters. Even though, Red Snapper is well known as coral fish (Gallaway, Szedlmayer, & Gazey, 2009), but mangrove ecosystem is an important area for the life cycle of some Red Snapper (Monteiro, Giarrizzo, & Isaac, 2009). The spawning of Red Snapper occurs in the coastal area, including inshore and estuarine area (Fry et al., 2009). Thus, the restocking of Red Snapper is dependent to the condition of mangrove ecosystem.

Snapper (*Lutjanidae*) is a group of coastal mesopredators which is susceptible to decline and threatened by over-exploitation (Hammerschlag-Peyer & Layman, 2010). Red snapper (*Lutjanus* sp.) is an important fish commodity in Central Java Province. The northern coastal area of Central Java has important value to the artisanal fisheries. The coastal waters consisted of several clusters of coral reefs. Moreover, the tidal activity is relative calm which is supportive for the fishing activity of coral fishes, including the Red Snapper.

Red Snapper is widely distributed all over the world, but genetic analysis showed there are differences among locations (Soewardi & Suwarso, 2006). Genetic analysis showed that there are several genetical differences of Red Snapper caught in Java Sea, in which the northern coastal area of Central Java has one of the specified character (Soewardi & Suwarso, 2006). The northern coastal area of Central Java is unique coastal water condition. The geographic condition forms a huge basin from Demak to Brebes, while Jepara, Pati and Rembang are located in the upper area. Thus, the oceanographic activity in the basin area is generally calm.

Mangrove ecosystem is one of the most dynamic ecosystem in the coastal area. Various factors could affect

the condition of mangrove. Mangrove could naturally extend, but could also be decreased due to the environmental stress it achieves. Moreover, anthropogenic driven factors also has significant impact on mangrove ecosystem. The mangrove ecosystem in Central Java is fluctuated, both the coverage and the condition (Mondal, Trzaska, & de Sherbinin, 2017).

In order to maintain the sustainability of Red Snapper fishing, various effort has been conducted to minimize the risk of exploitation activity, such as measurement of maximum sustainable yield (MSY) (Baharudin, 2013). However, valuation of fish yields potential based on its ecological condition is still scarce. Moreover, whether the condition of an ecosystem could be utilized in the estimation of fish stock is not well understood. This research aimed to : study the fluctuation of red snapper yields, study the dynamic of mangrove coverage and its condition, and analyze the effect of mangrove dynamic to the yield of red snapper in the northern coastal area of Central Java.

METHODS

The area of interest of this research is the northern coastal area of Central Java, which consisted of thirteen Regencies/Cities. The research was conducted from November 2017 to February 2018. The primary data for this research was the yield of Red Snapper from the fishing activities and the mangrove coverage in Central Java. The yield data was achieved from the Statistics of Capture Fisheries, while mangrove coverage data was achieved from the Statistics of Marine, Coastal and Small Islands of the Fisheries and Marine Services of Central Java. Data coverage of the last ten years was selected as the sample.

Data analysis was conducted through regression analysis by curve estimation. However, before the regression analysis was conducted, the coverage of mangrove should be standardized. Mangrove ecosystem consisted of three condition levels, including good, moderate and poor. Thus, each level was considered to provide different effect on the fish stocks. In order to standardize the quality of particular level of mangrove coverage, qualification was conducted through weighting of mangrove state.

Table-1. Weighting of mangrove condition.

No.	Mangrove condition	Weighting			
		Q1	Q2	Q3	Q4
1	Good	1	1	1 (3/3)	1
2	Moderate	0	1	2/3	1/2
3	Poor	0	1	1/3	1/4

There are four weighting models utilized in this research. The first model (Q1) assumes that only mangrove with good condition would affect the yield of Red Snapper. Thus, mangrove with moderate and poor

conditions are neglected. The second model (Q2) assume that each mangrove condition has the same effect on the yield of Red Snapper. Thus, total mangrove coverage is utilized in the estimation. The third (Q3) and fourth (Q4)



models assume that, mangrove with moderate and poor conditions have different effect on the yield of Red Snapper. In the Q3, the weight of poor mangrove condition is considered only have 1/3 of the good mangrove condition, while the moderate mangrove condition is weighted as 2/3. While in the Q4, the moderate and poor mangrove conditions are considered to have 1/2 and 1/4 of the weight of good mangrove condition. Statistical analysis with ANOVA was

conducted to compare the weighted and unweighted total coverage of mangrove from the calculation.

RESULT

The yield of Red Snapper in the Northern coastal area of Central Java was fluctuated. Data collection only obtained data from 2009 to 2016. Unfortunately, the statistics of capture fisheries of the year 2013 was not available. Detailed fluctuation of Red Snapper yields is presented in Figure-1.

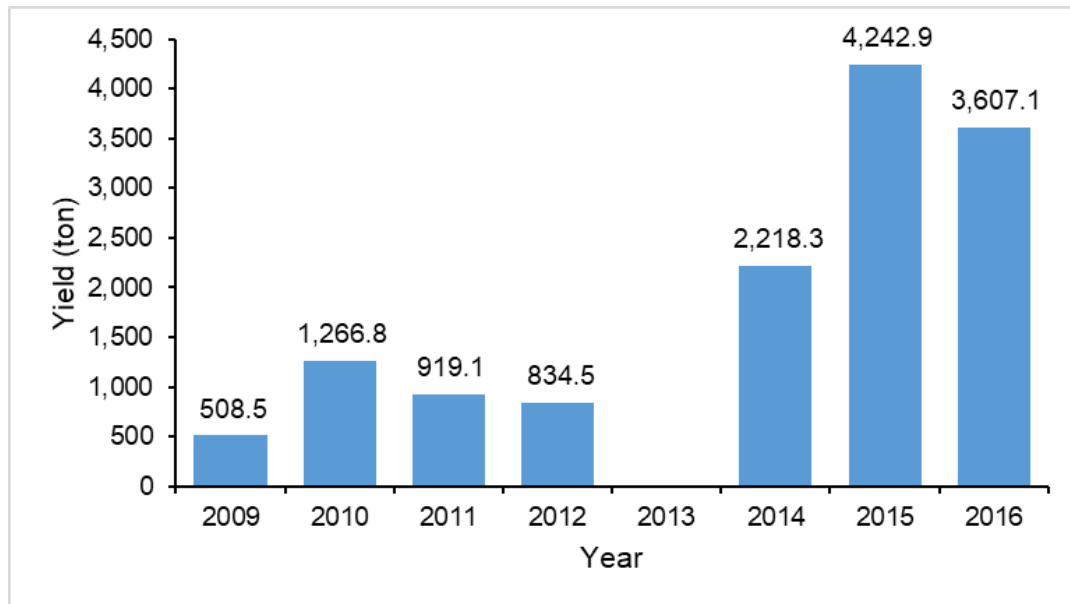


Figure-1. Fluctuation of red snapper (*Lutjanus* sp.) Catch in the Northern coastal area of central Java 2009-2016 (Source: Statistics of capture fisheries, marine and fisheries services of central Java).

Figure-1 shows that there was an increasing trend of Red Snapper yield in the northern coastal area of Central Java. According to the obtained data, the yield was lower in the early years. However, during 2014-2016 the yield was much higher than previous years. The condition of mangrove coverage in the northern coastal area of

Central Java was fluctuated. The fluctuation occurred on the mangrove coverage and its condition. Generally, the total mangrove coverage was decreased. Detailed fluctuation of the mangrove coverage is presented in Table-2.

Table-2. Fluctuation of mangrove coverage in the Northern coastal area of central Java 2009-2016.

Year	Mangrove coverage (ha)					
	Good (Q1)	Moderate	Poor	Total (Q2)	Weighted total I (Q3)	Weighted total II (Q4)
2009	6,183.9	3,246.0	3,447.0	12,877.0	9,497.0	8,668.7
2010	5,648.5	4,970.7	1,736.4	12,355.6	9,541.1	8,568.0
2011	6,306.1	2,249.1	1,783.3	10,338.4	8,399.9	7,876.5
2012	7,153.2	1,981.3	2,296.1	11,430.6	9,239.4	8,717.9
2013	8,571.9	1,988.7	2,209.1	12,769.8	10,634.1	10,118.6
2014	6,034.9	2,040.4	1,769.5	9,844.8	7,985.0	7,497.5
2015	5,787.9	2,038.5	3,487.6	11,314.1	8,309.5	7,679.1
2016	5,919.1	1,819.4	3,487.6	11,226.1	8,294.5	7,700.7
Average	6,450.7	2,541.8	2,527.1	11,519.6 ^a	8,987.6 ^b	8,353.4 ^b

Source: Statistik Kelautan, Pesisir dan Pulau-Pulau Kecil, Fisheries and Marine Services of Central Java (2009-2016)



Table-2 shows that mangrove with good condition was dominant in the observed years. The trend of mangrove with moderate condition was decreased along with the increasing coverage of mangrove with poor condition. In 2009, the total mangrove coverage was the highest, while the lowest was in 2014. However, in 2013 mangrove ecosystem in the northern coastal area of Central Java was in the greatest condition. Mangrove with good condition was at the highest coverage. Statistical analysis was conducted to compare the total and weighted total coverage of mangrove. The result shows that there

was no significant difference between Q3 and Q4, but the total coverage (unweighted - Q2) was significantly different from the two.

Regression analysis was conducted to formulate appropriate relationship model of mangrove coverage and the yield of Red Snapper in the northern coastal area of Central Java. The analysis was conducted through curve estimation, including the linear, logarithmic, exponential and power models. However, of the equation was simplified through linearization. Detailed result of the regression analysis is presented in Table-3.

Table-3. Model of red snapper yield – Mangrove coverage relationship in the Northern coastal area of central Java.

No.	Curve model	Equation	F	Sig.	R ²
A.	Q1				
1.	Linear	$y = 11,199.30 - 1.51x$	1.755	0.243	0.260
2.	Logarithmic	$y = 86,820.64 - 9,732.43 \ln(x)$	1.803	0.237	0.265
3.	Exponential	$\ln(y) = 258,100.67 - 0.84e^{-3} \cdot (x)$	1.892	0.227	0.275
4.	Power	$\ln(y) = 5.78e^{23} - 5.44 \cdot \ln(x)$	1.966	0.220	0.282
B.	Q2				
1.	Linear	$y = 6,419.88 - 0.40x$	0.436	0.538	0.080
2.	Logarithmic	$y = 40,513.57 - 4,133.01 \cdot \ln(x)$	0.370	0.570	0.069
3.	Exponential	$\ln(y) = 54,409.89 - 0.32 \cdot e^{-3} \cdot x$	1.071	0.348	0.176
4.	Power	$\ln(y) = 1.03 \cdot e^{17} - 3.41 \cdot \ln(x)$	0.956	0.373	0.160
C.	Q3				
1.	Linear	$y = 14,978.66 - 1.49x$	3.844	0.107	0.435
2.	Logarithmic	$y = 120,591.52 - 13,074.66 \cdot \ln(x)$	3.809	0.108	0.432
3.	Exponential	$\ln(y) = 3,148,749.06 - 0.87 \cdot e^{-3} \cdot x$	5.230	0.071	0.511
4.	Power	$\ln(y) = 3.17 \cdot e^{33} - 7.70 \cdot \ln(x)$	5.231	0.071	0.511
D.	Q4				
1.	Linear	$y = 18,334.34 - 2.02x$	5.641	0.064	0.530
2.	Logarithmic	$y = 149,971.52 - 16,451.41 \cdot \ln(x)$	5.634	0.064	0.530
3.	Exponential	$\ln(y) = 20,781,649.58 - 1.18 \cdot e^{-3} \cdot x$	7.915	0.037	0.613
4.	Power	$\ln(y) = 4.08 \cdot e^{40} - 9.58 \cdot \ln(x)$	7.929	0.037	0.613

Table-3 shows that among the equation models, only the equation resulted from the Q4 with the exponential and power trends has significant relationship to the yield of Red Snapper in the northern coastal area of Central Java. The linearized equations resulted from the analysis were $\ln(y) = 20,781,649.58 - 1.18 \cdot e^{-3} \cdot x$ and $\ln(y)$

$= 4.08 \cdot e^{40} - 9.58 \cdot \ln(x)$ respectively for the exponential and power trends. However, both equations have similar probability and determination levels which are 0.037 and 61.3%. The relationship is presented in a graphical view as shown in Figure-2.

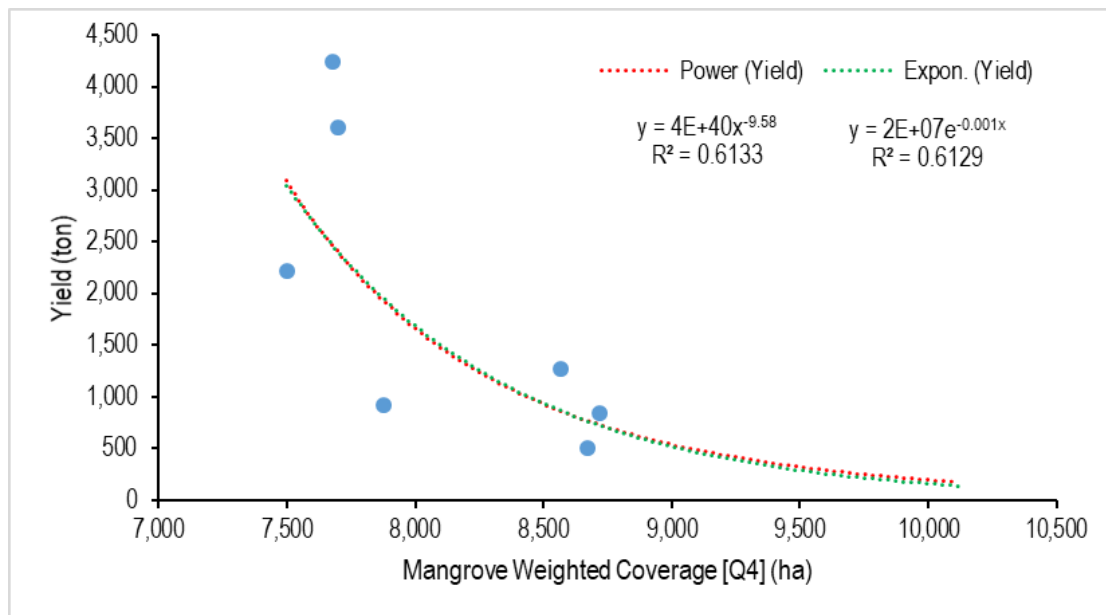


Figure-2. Trend of mangrove coverage – red snapper yield in the Northern coastal area of central Java.

Figure-2 shows that mangrove coverage tends to have negative effect on the yield of Red Snapper in the northern coastal area of Central Java. Increasing mangrove coverage significantly decreases the yield of Red Snapper. However, this result disobeys the condition of coral reefs and the fishing effort for Red Snapper.

DISCUSSIONS

Red Snapper is one of the important fish resource in the world. Red Snapper refers to many fish species, including *Centroberyx affinis*, *C. gerrardi*, *Etelis carbunculus*, *E. oculus*, *Lutjanus argentimaculatus*, *L. bengalensis*, *L. bohar*, *L. compechanus*, *L. dodecanthoides*, *L. erythropterus*, *L. gibbus*, *L. jordanii*, *L. lemniscatus*, *L. malabaricus*, *L. monostigma*, *L. sanguineus*, *L. sebae*, *L. vivanus*, *Rhomboplites aurrorubens*, and *Sebastes ruberrimus* (www.fishbase.de). However, the Red Snapper in Indonesia refers to the fish species from the genus Lutjanidae, especially *Lutjanus malabaricus* (Soewardi & Suwarso, 2006; Wahyuningsih, Prihatiningsih, & Ernawati, 2013).

Generally, Red Snapper is fish with a long life cycle. It reaches maturity at the age of 2 years (Gallaway *et al.*, 2009). The main habitat of most of the Red Snapper species are coral reefs, however sometimes older fish also found in the open sea (Gallaway *et al.*, 2009). Catches of Red Snapper mostly occur in depth of 50 to 90 m where coral or coral like structure exist (Karnauskas & Walter III, 2017). Another factors affect the distribution of Red Snapper includes temperature, salinity, chlorophyll, turbidity and current speed in the bottom (Matrutty, 2016). Even though Red Snapper is distributed widely in the world, but there might be some genetic differences among location (Soewardi & Suwarso, 2006). Red snapper (*Lutjanus malabaricus*) spawns in the various habitat, including inshore and estuarine areas with silty, muddy, and coarse sand/rubble substrates at the size of 300 mm

and 237 mm respectively for male and female (Fry *et al.*, 2009). When the fish becomes an adult, it inhabits deeper water area.

The protein content of Red Snapper is pretty high with 15.61% (Natsir & Latifa, 2018). Red Snapper contains various essential fatty acid such as saturated fatty acid (SFA), monounsaturated fatty acid (MUFA), and polyunsaturated fatty acid (PUFA) (Jacoeb, Suptijah, & Kristantina, 2015). At least there are 12 SFAs identified in the Red Snapper's meat where palmitic acid was the most dominant concentration, while MUFA and PUFA consisted of eight types of fatty acids respectively with oleic acid and Cis-4,7,10,13,16,19-Docosahexaenoic acid as the most dominant components (Jacoeb *et al.*, 2015). The economic value of Red Snapper is between Rp. 45,000 to Rp. 70,000 (Rikza *et al.*, 2013). Instead of the commercial purpose, Red Snapper is also become one of the favorite target of tourism fishing (Hammerschlag-Peyer & Layman, 2010).

Fluctuation on the fishing yield generally occurs due to various factors related to fishing activity. The number of fishing effort, type of fishing gear, fishing ground, as well as the fishing power affects the exploitation rate (Caddy, 2011; Overzee & Rijnsdorp, 2015). The increasing yield of Red Snapper in the last few years could be caused by the change of some the mentioned factors.

Red Snapper is an important commodity in the capture fisheries sector in Indonesia. Red Snapper fishing is one of five fish species with the highest yield in Indonesia (Rikza *et al.*, 2013). However, the stock of Red Snapper in many regions in Indonesia has been reported to be overfished (Lukman, 2012; Suryana *et al.*, 2012). Catch of Red Snapper showed that most of the captured fish is under the reproductive size (Wahyuningsih *et al.*, 2013). Generally, excessive fishing effort is considered as the main cause of the resource depletion (Costello *et al.*,



2016). But, recent researches show that the degradation of the essential ecosystems has significant contribution to the long term resource depletion (Zhou *et al.*, 2010). However, the estimation to the contribution of ecosystem degradation on the resource dynamic is rarely conducted.

The decreased fish stocks definitely affect the yield of capture fisheries. It further impacts the fishing activity, productivity as well as the prosperity of the fishermen (Nayak, Oliveira, & Berkes, 2014). The resource overfishing along with the degraded ecosystem generates multiplied impact on the decrease of fish stocks. Degraded ecosystems would slow down the stock recovery processes (Wilson *et al.*, 2010). In the meantime, fishing activity tends to occur at the constant or even increased rate. Thus, the decrease of fish stock might be accelerated.

Another impact of fish over-exploitation is biological overfishing (Lin, Chang, Sun, & Tzeng, 2010; Thuy & Flaaten, 2013). Captured fish size is decreased due to the limited stock of adult fish. Younger fish is forced to reproduce causing decreased catchable size (Overzee & Rijnsdorp, 2015). The degraded ecosystems also decrease the availability of suitable habitat. Thus, the resource is more vulnerable to degradation. Rehabilitation of coastal ecosystems is required to improve the carrying capacity to the fish resources (Guntur, Sambah, Arisandi, Jauhari, & Jaziri, 2018).

The fluctuation of mangrove coverage and condition in the northern coastal area of Central Java was due to the intensive utilization of the coastal area (Cerlyawati, Anggoro, & Zainuri, 2017). Generally, anthropogenic activity becomes the main factor affecting the dynamic of mangrove ecosystem. Mangrove related activity such as pond, agriculture, and settlement developments cause direct impact on the reduction of mangrove coverage (Udoh, 2016). However, there are replanting activities which improve the mangrove coverage (Cerlyawati *et al.*, 2017; Hastuti & Hastuti, 2018).

The development of industries, settlements and agriculture in the upland area indirectly affect the condition of mangrove ecosystem in the coastal area. Those activities produce pollutants and increase sediment transport causing the decrease of water quality in the downstream, estuaries and coastal areas (Benitez, Ceron-Breton, Ceron-Breton, & Rendon-Von-Osten, 2014; Maiti & Chowdhury, 2013; Pawar, 2016). For mangrove ecosystem, increasing sediment loads causes disturbance on mangrove rooting and further cause stress on mangrove trees (Okello *et al.*, 2014). Thus, the mangrove ecosystem in Central Java was fluctuated, both the coverage and the condition.

Mangrove and seagrass ecosystems are the nursery ground of Lutjanidae family during juvenile and sub-adults stage (Monteiro *et al.*, 2009). However, not all of the fish species from the genus *Lutjanus* occupy mangrove as their nursery habitat. Even most of the species are dependent to coral reefs (Frédérich & Santini, 2017; Fukunaga, Kosaki, & Hauk, 2017). The result of the research showed that mangrove coverage has negative impact on the yield of Red Snapper. This indicates that the

Red Snapper species existed in the northern coastal area of Central Java is not Mangrove Red Snapper (*L. argentimaculatus*). Thus, instead of having positive impact, the increasing mangrove coverage decreases the yield of Red Snapper. Unfortunately, there is no appropriate data about the condition of coral reefs in the northern coastal area of Central Java. Moreover, the coral reef ecosystem in Central Java only existed in limited area. Thus, it is considered that the catch of Red Snapper in northern coastal area of Central Java did not only occur in the coastal water, but also in the open sea.

Considering that Red Snapper has a long life cycle, there is a possibility that the negative impact of mangrove doesn't occur in a real time, but as the effect of mangrove condition several years backward (McNally, Uchida, & Gold, 2011). Another factor that should be considered is the increasing activity in the land area. Various anthropogenic activities including agriculture, aquaculture and industry lead to the increase of pollutant load to the aquatic environment, including the rivers, estuaries and coastal waters (Benitez *et al.*, 2014; Pawar, 2016). Moreover, increasing anthropogenic activities leads to the increase of freshwater discharge which becomes one factor affecting the survival of Red Snapper larvae (Hernandez Jr, Filbrun, Fang, & Ransom, 2016). Generally, the pollutants could be remediated by mangrove ecosystem (Jing *et al.*, 2015). However, the remediation capacity of mangrove is limited. Thus, excessive pollutant loads could not be treated optimally.

The impacts could be observed on the coral reef and seagrass ecosystems. Currently, the turbidity of water in most of the coral reefs and seagrass ecosystem is increased (L G Gillis *et al.*, 2014). Mangrove ecosystem is vulnerable to turbidity stress. Increased turbidity limits the light penetration so it could not reach coral reefs (Erftemeijer, Riegl, Hoeksema, & Todd, 2012), or at least decrease its intensity. Moreover, sediment particles of the turbid water could cover mangrove polyps and cause its death.

Further impact of water quality degradation in the coral reef area is the limitation of food source for Red Snapper. Coral reef provides more complex prey resources for Red Snapper (Schwartzkopf, Langland, & Cowan, 2017). There are various sources of Red Snappers food, including shrimp, fish, crab, zooplankton and zoobenthos (Chi & True, 2017). However, Red Snapper dominantly feeds on small fishes in the coral reef ecosystem, while the small sized fish feed more on zooplankton at artificial reefs placed in the mud substrate during spring (Schwartzkopf *et al.*, 2017). The disturbed environment affects the community of micro-organisms which lead to the change of the structure of food webs. Thus, the diversity and abundance of the natural food of Red Snapper is as well disturbed.

Even though mangrove showed negative impact on the yield of Red Snapper, various factors seems to have more contribution on the declining fish stocks. However, mangrove management is required in order to support another coastal ecosystems, such as estuaries, seagrass and coral reefs (Campbell, Kartawijaya, & Sabarini, 2011;



Granek, Compton, & Phillips, 2009). An appropriate mangrove condition and extent could help improving the coastal water quality through the environmental services it provides.

However, the most challenging effort which should be conducted related to the recovery of Red Snapper fish stocks is the rehabilitation of coral reefs ecosystem. Compared to any other coastal ecosystem, coral reef requires a much longer time to recover (Perry & Morgan, 2017; Roff & Mumby, 2012). The growth and development of coral organism is very slow, thus rehabilitation process takes a few decades or even centuries. However, various efforts should be conducted to support the recovery process, including minimizing pollutant and sediment load to the coral ecosystem (Hairsine, 2017), improving water quality, and preserving coral area from any activities (Hsieh *et al.*, 2011), especially the destructive ones.

Mangrove ecosystem is strongly related to another coastal ecosystems and the fisheries resource within. A study showed that the decrease of mangrove coverage significantly decreases the biomass of mullet in the seagrass ecosystem (Ola, 2008). However, the role is less noticeable in the northern coastal area of Central Java, because the sediment structure is dominated by clay. Moreover, the seagrass and coral reefs ecosystems are limited to certain regencies. According to the statistics book of Marine, Coastal and Small Islands by Fisheries and Marine Services of Central Java, seagrass ecosystem is only recorded in Batang, Jepara and Pati Regencies, while coral reef is recorded in Tegal, Pemalang, Pekalongan, Batang, Kendal, Jepara, Pati and Rembang Regencies. However, proper management of mangrove ecosystem is still required in order to support coastal area as habitat of the other fish species.

Mangrove ecosystem services such as nutrient retention and recycling, pollutant and sediment trapping, controlling nutrient release is required to improve the quality of coastal waters. Without mangrove, coastal water is more vulnerable to nutrient enrichment which may cause eutrophication (L G Gillis *et al.*, 2014). Moreover, tidal dynamic may drag sediment and nutrient to the offshore area causing further ecological disturbance.

Recent effort to fulfil the market needs of Red Snapper fisheries has been conducted through aquaculture activities (Abbas, Siddiqui, & Jamil, 2011). However, the capacity to conduct artificial breeding is still limited, thus the juvenile is still dependent to the wild source which is seasonal, variable and probably unsustainable (Chi & True, 2017). The degradation of coastal ecosystem contributes to the increasing stress on fish resources due to the loss of its spawning and nursery areas.

Management of fish resource should consider the sustainability of the resource as well as the ecological, social and economics sustainability (Suryana *et al.*, 2012). Various fishing aspects such as fishing ground, fishing effort, resource-friendly fishing gear, as well as human resource utilization should be regulated to maintain the sustainable rate (Failler, Pan, Thorpe, & Tokrisna, 2014). However, the ecology of fishing activities should also be

considered. Fishing activities in the previous decades has considered about the resource sustainability, but the ecological sustainability is mostly neglected. This paradigm should be changed. Since fish resource is mainly related to its restocking capability, while restocking capability is mainly related to the ecosystem conditions, thus the management of ecosystem should take the first place to consider.

In order to improve of the wild stock of Red Snapper, integrated management acts should be conducted. The impact of anthropogenic activities is the main issue which should be overcome (Liu, Wang, & Chen, 2013), not just for Red Snapper but also for any other fish resources. Waste management along with optimization of mangrove ecosystem services could be emphasized to maintain the water quality of the coastal area. Protection on the spawning and nursery ground becomes the second priority to improve the restocking rate and survival of fish juveniles. Specifically related to Red Snapper, this should be supported through the rehabilitation of coral reef ecosystem. Development of artificial reefs is also required to improve the residence time for Red Snapper (Topping & Szedlmayer, 2011). Then, limitation of fishing effort, allowable catch size, as well as the yield should be determined so that biological overfishing doesn't occur. Thus, the sustainability of Red Snapper fishing business could be maintained.

CONCLUSIONS

The yield of Red Snapper in the northern coastal area of Central Java is increasing, however the coverage of mangrove tends to decrease. Mangrove coverage has significant negative effect on the yield of Red Snapper in the northern coastal area of Central Java. Each mangrove condition need to be weighted to standardize the quality of mangrove where mangrove with moderate condition has a half impact, while poor condition has a quarter impact of the good mangrove condition.

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REFERENCES

- Abbas G., Siddiqui P. J. A. & Jamil K. 2011. The Optimal Protein Requirements of Juvenile Mangrove Red Snapper, *Lutjanus argentimaculatus* fed isoenergetic diets. Pakistan Journal of Zoology. 44(2): 469-480.
- Auliyah N. & Blongkod A. 2018. Struktur Komunitas Mangrove Pesisir Pantai Desa Dalapuli Barat, Bolaang Mongondow Utara. Gorontalo Fisheries Journal. 1(1): 1-11. <https://doi.org/10.32662/v1i1.92>
- Baharudin L. 2013. Potensi Lestari Ikan Kakap di Perairan Kabupaten Sambas. Vokasi. 9(1): 1-



10.http://repository.polnep.ac.id/xmlui/handle/123456789/1228

Benitez J. A., Ceron-Breton R. M., Ceron-Breton J. G. & Rendon-Von-Osten J. 2014. The environmental impact of human activities on the Mexican coast of the Gulf of Mexico: review of status and trends. *WIT Transactions on Ecology and the Environment*. 181, 37-50. <https://doi.org/10.2495/EID140041>

Black B. A., Allman R. J., Schroeder I. D. & Schirripa M. J. 2011. Multidecadal otolith Growth Histories for Red and Gray Snapper (*Lutjanus* spp.) in the Northern Gulf of Mexico, USA. *Fisheries Oceanography*. 20(5): 347-356. <https://doi.org/10.1111/j.1365-2419.2011.00588.x>

Caddy J. F. 2011. Sustainability indicators for fisheries: their use in fisheries management. Part ii. *ciencia pesquera*. 19(1): 73-100.

Campbell S. J., Kartawijaya T. & Sabarini E. K. 2011. Connectivity in reef fish assemblages between seagrass and coral reef habitats. *Aquatic Biology*, 13, 65-77. <https://doi.org/10.3354/ab00352>

Cerlyawati H., Anggoro S. & Zainuri M. 2017. Mangrove Rehabilitation Program in North Coast, Central Java-Indonesia (Case Study in Regency of Brebes, Pemalang and Demak). *Journal of Applied Environmental and Biological Sciences*. 7(5): 131-139.

Chi V. V & True J. D. 2017. Recruitment and habitat ecology of juvenile mangrove red snapper (*Lutjanus argentimaculatus* Forsskal, 1775) in central Vietnam. *International Journal of Fisheries and Aquatic Studies*. 5(6): 103-107.

Costello C., Ovando D., Clavelle T., Strauss C. K., Hilborn R., Melnychuk M. C., ... Leland A. 2016. Global fishery prospects under contrasting management regimes. *PNAS*. 113(18):5125-5129. <https://doi.org/10.1073/pnas>.

Cowan J. H., Grimes C. B., Patterson W. F., Walters C. J., Jones A. C., Lindberg W. J., ... Rose K. A. 2011. Red snapper management in the Gulf of Mexico: science- or faith-based? *Reviews in Fish Biology and Fisheries*, 21(2): 187-204. <https://doi.org/10.1007/s11160-010-9165-7>

Erfteimeijer P. L. A., Riegl B., Hoeksema B. W. & Todd P. A. 2012. Environmental impacts of dredging and other sediment disturbances on corals: A review. *Marine Pollution Bulletin*, 64(9): 1737-1765. <https://doi.org/10.1016/j.marpolbul.2012.05.008>

Failler P., Pan H., Thorpe A. & Tokrisna R. 2014. On macroeconomic impact of fishing effort regulation: measuring bottom-up fish harvesters economy-wide contribution. *Natural Resources*, 5, 269-281. <https://doi.org/10.4236/nr.2014.57025>

Frédérich B. & Santini F. 2017. Macroevolutionary analysis of the tempo of diversification in snappers and fusiliers (Percomorpha: Lutjanidae). *Belgian Journal of Zoology*. 147(1): 17-35. <https://doi.org/10.26496/bjz.2017.2>

Fry G., Milton D. A., Velde T. Van Der, Stobutzki I., Andamari R., Badrudin & Sumiono B. 2009. Reproductive Dynamics and Nursery Habitat Preferences of two Commercially Important Indo-Pacific Red Snappers *Lutjanus erythropterus* and *L. malabaricus*. *Fisheries Science*. 75, 145-158. <https://doi.org/10.1007/s12562-008-0034-4>

Fukunaga A., Kosaki R. K. & Hauk B. B. 2017. Distribution and abundance of the introduced snapper *Lutjanus kasmira* (Forsskal, 1775) on shallow and mesophotic reefs of the Northwestern Hawaiian Islands. *BioInvasions Records*. 6(3): 259-268. <https://doi.org/10.3391/bir.2017.6.3.12>

Galloway B. J., Szedlmayer S. T. & Gazey W. J. 2009. A life history review for Red Snapper in the Gulf of Mexico With An Evaluation Of The Importance Of Offshore Petroleum Platforms and Other Artificial Reefs. *Reviews in Fisheries Science*, 17(1): 48-67. <https://doi.org/10.1080/10641260802160717>

Gillis L. G., Bouma T. J., Cathalot C., Ziegler A. D. & Herman P. M. 2015. Particulate Matter in Mangrove Forests and Seagrass Beds as a Nitrogen Source in Tropical Coastal Ecosystems. *Biotropica*, 47(3): 286-291. <https://doi.org/10.1111/btp.12220>

Gillis L. G., Bouma T. J., Jones C. G., Katwijk M. M. Van, Nagelkerken I., Jeuken C. J. L., ... Ziegler A. D. 2014. Potential for Landscape-Scale Positive Interactions Among Tropical Marine Ecosystems. *Marine Ecology Progress Series*, 503, 289-303. <https://doi.org/10.3354/meps10716>

Granek E. F., Compton J. E. & Phillips D. L. 2009. Mangrove-Exported Nutrient Incorporation By Sessile Coral Reef Invertebrates. *Ecosystems*, 12, 462-472. <https://doi.org/10.1007/s10021-009-9235-7>

Guntur G., Sambah A. B., Arisandi D. M., Jauhari A. & Jaziri A. A. 2018. Study on water quality around mangrove ecosystem for coastal rehabilitation Study on water quality around mangrove ecosystem for coastal rehabilitation. *IOP Conference Series: Earth and Environmental Science*, 106, 12041. <https://doi.org/10.1088/1755-1315/106/1/012041>

Hairsine P. B. 2017. Review: Sediment-related controls on the health of the Great Barrier Reef. *Vadose Zone Journal*, 16(12). <https://doi.org/10.2136/vzj2017.05.0115>

Hammerschlag-Peyer C. M. & Layman C. A. 2010. Intrapopulation variation in habitat use by two abundant



- coastal fish species. *Marine Ecology Progress Series*. 415, 211-220. <https://doi.org/10.3354/meps08714>
- Hastuti E. D. & Hastuti R. B. 2018. Growth characteristics of mangrove seedling in silvofishery pond – the allometric relationship of height, diameter and leaf abundance. *IOP Conf. Series: Earth and Environmental Science*, 130, 12015. <https://doi.org/10.1088/1755-1315/130/1/012015>
- Hernandez Jr, F. J., Filbrun, J. E., Fang J. & Ransom J. T. 2016. Condition of Larval Red Snapper (*Lutjanus campechanus*) Relative to Environmental Variability and the Deepwater Horizon oil spill. *Environmental Research Letters*. 11(9): 94019. <https://doi.org/10.1088/1748-9326/11/9/094019>
- Hsieh H. J., Chen K.-S., Lin Y. I., Huang Y. A., Baird A. H., Tsai W.-S., ... Chen C. A. 2011. Establishment of a no-take area (NTA) Could Not Guarantee The Preservation of Coral Communities in Chinwan Inner Bay, Penghu, Taiwan. *Zoological Studies*. 50(4): 443-453.
- Jacob A. M., Suptijah P. & Kristantina W. A. 2015. Komposisi Asam Lemak, Kolesterol, dan Deskripsi Jaringan Fillet Ikan Kakap Merah Segar & Goreng. *JPHPI*. 18(1): 98-107. <https://doi.org/10.17844/jphpi.2015.18.1.98>
- Jing H., Xia X., Liu H., Zhou Z., Wu C. & Nagarajan S. 2015. Anthropogenic impact on diazotrophic diversity in the mangrove rhizosphere revealed by nifH pyrosequencing. *Frontiers in Microbiology*. 6, 1172. <https://doi.org/10.3389/fmicb.2015.01172>
- Karnauskas M. & Walter III J. F. 2017. Red Snapper distribution on natural habitats and artificial structures in the Northern Gulf of Mexico. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science*. 9(c): 50–67. <https://doi.org/10.1080/19425120.2016.1255684>
- Lapolo N., Utina R., & Baderan D. W. K. 2018. Diversity and density of crabs in degraded mangrove area at Tanjung Panjang Nature Reserve in Gorontalo, Indonesia. *Biodiversitas*, 19(3): 1154-1159. <https://doi.org/10.13057/biodiv/d190351>
- Lin Y.-J., Chang Y.-J., Sun C.-L. & Tzeng W.-N. 2010. Evaluation of the Japanese eel fishery in the lower reaches of the Kao-Ping River, southwestern Taiwan using a per-recruit analysis. *Fisheries Research*. 106(3): 329-336. <https://doi.org/10.1016/j.fishres.2010.08.015>
- Lindegren M., Diekmann R., & Möllmann C. 2010. Regime Shifts, Resilience and Recovery of a Cod stock. *Marine Ecology Progress Series*. 402, 239-253. <https://doi.org/10.3354/meps08454>
- Liu T.-K., Wang M.-W. & Chen P. 2013. Influence of waste Management Policy on the Characteristics of Beach Litter in Kaohsiung, Taiwan. *Marine Pollution Bulletin*. 72(1): 99-106. <https://doi.org/10.1016/j.marpolbul.2013.04.015>
- Lukman E. 2012. Evaluasi Aspek Biologi Terhadap Kegiatan Penangkapan Ikan Kakap Merah (*Lutjanus*) dan Pengembangannya di Sekitar Perairan Sinjai Teluk Bone. *Bimafika*. 4, 417-419.
- MacKenzie R. A. & Cormier N. 2012. Stand Structure Influences Nekton Community Composition And Provides Protection From Natural Disturbance in Micronesian mangroves. *Hydrobiologia*. 685(1): 155–171. <https://doi.org/10.1007/s10750-011-0865-3>
- Maiti S. K. & Chowdhury A. 2013. Effects of anthropogenic pollution on mangrove biodiversity: a review. *Journal of Environmental Protection*. 4, 1428-1434. <https://doi.org/10.4236/jep.2013.412163>
- Matrutty D. D. P. 2016. Profil kondisi oseanografi daerah penangkapan ikan (pasi) ikan Kakap Merah sub famili Etelinae di Kepulauan Lease. *Amanisal*. 5(1): 10-17.
- McNally C. G., Uchida E. & Gold A. J. 2011. The effect of a protected area on the tradeoffs between short-run and long-run benefits from mangrove ecosystems. *PNAS*, 108(34): 13945-13950. <https://doi.org/10.1073/pnas.1101825108>
- Mendoza-Carranza M., Hoeinghaus D. J., Garcia A. M. & Romero-Rodriguez A. 2010. Aquatic food webs in mangrove and seagrass habitats of Centla Wetland, a Biosphere Reserve in Southeastern Mexico. *Neotropical Ichthyology*. 8(1): 171-178.
- Mondal P., Trzaska S. & de Sherbinin A. 2017. Landsat-derived estimates of mangrove extents in the Sierra Leone coastal landscape complex during 1990–2016. *Sensors*. 18(2): 12. <https://doi.org/10.3390/s18010012>
- Monteiro D. P., Giarrizzo T. & Isaac V. 2009. Feeding ecology of juvenile Dog Snapper *Lutjanus jocu* (Bloch and Schneider, 1801) (Lutjanidae) in intertidal mangrove creeks in Curuçá Estuary (Northern Brazil). *Brazilian Archives of Biology and Technology*. 52(6): 1421-1430.
- Natsir N. A. & Latifa S. 2018. Analisis kandungan protein total ikan Kakap Merah dan ikan Kerapu Bebek. *Jurnal Biology Science & Education*. 7(1): 49-55.
- Nayak P. K., Oliveira L. E. & Berkes F. 2014. Resource degradation, marginalization, and poverty in small-scale fisheries: threats to social-ecological resilience in India and Brazil. *Ecology and Society*. 19(2): 73. <https://doi.org/10.5751/ES-06656-190273>
- Nyanti L., Nur Asikin R., Ling T. Y. & Jongkar G. 2012. Fish diversity and water quality during flood mitigation works at Semariang. *Sains Malaysiana*. 41(12): 1517-1525.



- Okello J. A., Robert E. M. R., Beeckman H., Kairo J. G., Dahdouh-Guebas F. & Koedam N. 2014. Effects of Experimental Sedimentation on the Phenological Dynamics And Leaf Traits Of Replanted Mangroves at Gazi Bay, Kenya. *Ecology and Evolution*. 4(6): 3187-3200. <https://doi.org/10.1002/ece3.1154>
- Ola O. La. 2008. Kajian Dampak Pemanfaatan Hutan Mangrove Terhadap Penurunan Biota Laut pada Ekosistem Lamun di Kepulauan Wakatobi. *Agriplus*. 19(2): 90-96.
- Overzee H. M. J. van & Rijnsdorp A. D. 2015. Effects of fishing during the spawning period: implications for sustainable management. *Reviews in Fish Biology and Fisheries*. 25(1): 65-83. <https://doi.org/10.1007/s11160-014-9370-x>
- Pawar P. R. 2016. Anthropogenic threats to coastal and marine biodiversity: A review. *International Journal of Modern Biological Research*. 4, 35-45.
- Perry C. T. & Morgan K. M. 2017. Post-bleaching coral community change on southern Maldivian reefs: is there potential for rapid recovery? *Coral Reefs*. 36(4): 1189-1194. <https://doi.org/10.1007/s00338-017-1610-9>
- Rahman M. M., Rahman M. T., Rahaman M. S., Rahman F., Ahmad J. U., Shakera B. & Halim M. A. 2013. Water quality of the world's largest mangrove forest. *Canadian Chemical Transactions*. 1(2): 141-156. <https://doi.org/10.13179/canchemtrans.2013.01.02.0018>
- Rikza C., Asriyanto & Yulianto T. 2013. Pengaruh perbedaan umpan dan waktu pengoperasian pancing perawai (set bottom longline) terhadap hasil tangkapan ikan Kakap Merah (*Lutjanus spp*) di sekitar perairan Jeparan. *Journal of Fisheries Resources Utilization Management and Technology*. 2(3): 152-161.
- Roff G. & Mumby P. J. 2012. Global disparity in the resilience of coral reefs. *Trends in Ecology & Evolution*. 27(7): 404-413. <https://doi.org/10.1016/j.tree.2012.04.007>
- Rouyer T., Ottersen G., Durant J. M., Hidalgo M., Hjermann D. O., Persson J., ... Stenseth N. C. 2011. Shifting dynamic forces in fish stock fluctuations triggered by age truncation? *Global Change Biology*. 17, 3046-3057. <https://doi.org/10.1111/j.1365-2486.2011.02443.x>
- Saifullah A. S. M., Kamal A. H. M., Idris M. H., Rajae A. H. & Bhuiyan M. K. A. 2016. Phytoplankton in Tropical Mangrove Estuaries: Role and Interdependency. *Forest Science and Technology*. 12(2): 104-113. <https://doi.org/10.1080/21580103.2015.1077479>
- Schwartzkopf B. D., Langland T. A. & Cowan J. H. 2017. Habitat Selection Important for Red Snapper Feeding Ecology in the Northwestern Gulf of Mexico. *Marine and Coastal Fisheries*. 9(1): 373-387. <https://doi.org/10.1080/19425120.2017.1347117>
- Shoab M., Burhan Z. U. N., Shafique S., Jabeen H. & Siddique P. J. A. 2017. Phytoplankton Composition in a Mangrove Ecosystem at Sandspit, Karachi, Pakistan. *Pakistan Journal of Botany*. 49(1): 379-387.
- Sihombing V. S., Gunawan H. & Sawitri R. 2017. Diversity and community structure of fish, plankton and benthos in Karangsong Mangrove Conservation Areas, Indramayu, West Java, Indonesia. *Biodiversitas*. 18(2): 601-608. <https://doi.org/10.13057/biodiv/d180222>
- Soewardi K. & Suwarso. 2006. Variasi geografik dalam struktur genetik populasi ikan Kakap Merah, *Lutjanus malabaricus* (Lutjanidae) dan interaksi lingkungan di Laut Jawa. *Jurnal Ilmu-Ilmu Perairan Dan Perikanan Indonesia*. 13(1): 69-75.
- Suryana A., Wiryawan B., Monintja D. R. & Wiyono, Ek. S. 2012. Analisis keberlanjutan RAPFISH dalam pengelolaan sumber daya ikan Kakap Merah (*Lutjanus sp.*) di perairan Tanjungpandan. *Buletin PSP*. 20(1): 45-59.
- Thuy P. T. T. & Flaaten O. 2013. The backward-bending supply curve in fisheries-revisited. *Journal of Sustainable Development*. 6(6): 15-33. <https://doi.org/10.5539/jsd.v6n6p15>
- Topping D. T. & Szedlmayer S. T. 2011. Site fidelity, residence time and movements of red snapper *Lutjanus campechanus* estimated with long-term acoustic monitoring. *Marine Ecology Progress Series*. 437, 183-200. <https://doi.org/10.3354/meps09293>
- Udoh J. P. 2016. Sustainable Nondestructive Mangrove-Friendly Aquaculture in Nigeria I: Ecological and Environmental Perspectives. *AAFL Bioflux*. 9(1): 50-70.
- Wahyuningsih Prihatiningsih & Ernawati T. 2013. Parameter Populasi Ikan Kakap Merah (*Lutjanus malabaricus*) di Perairan Laut Jawa Bagian Timur. *BAWAL*. 5(3): 175-179.
- Wilson S. K., Fisher R., Pratchett M. S., Graham N. A. J., Dulvy N. K., Turner R. A., ... Polunin N. V. C. 2010. Habitat degradation and fishing effects on the size structure of coral reef fish communities. *Ecological Applications*. 20(2): 442-451.
- Zakaria M. & Rajpar M. N. 2015. Assessing the fauna diversity of Marudu Bay Mangrove Forest, Sabah, Malaysia, for future conservation. *Diversity*. 7(2): 137-148. <https://doi.org/10.3390/d7020137>