
It is widely subscribed in India and abroad by Institutions and Individuals in education and research as well as by Industries, Government Departments and Research Institutes.

Homepage Contact Join the conversation about this journal Enter Journal Title, ISSN or Publisher Name Quarters The set of journals have been ranked according to their SJR and divided into four equal groups, four quarters.

Q1 (green) comprises the quarter of the journals with the highest values, Q2 (yellow) the second highest values, Q3 (orange) the third highest values and Q4 (red) the lowest values. Category Year Quarters Ecology 1999 Q4 Ecology 2000 Q3 Ecology 2001 Q3 Ecology 2002 Q3 SJR The SJR is a size-independent prestige indicator or that ranks journals by their age per article. It is based on the idea that 'all citations are not created equal'.

SJR is a measure of scientific influence of Citations per document This indicator or counts
the number of citations received by documents from a journal and divides them by the total number of documents published in that journal. The chart shows the evolution of the average number of citations per document from 1999 to 2017. Ecology Evolution, Behaviour and Systematics Nature and Landscape Conservation journals that accounts for both the number of citations received by a journal and the importance or prestige of the journals where such citations come from. It measures the scientific influence of the average article times documents published in a journal in the past two, three, and four years have been cited in the current year. The two-year line is equivalent to the journal impact factor™ (Thomson Reuters) metric.

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
<th>Cites / Doc. (4 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>0.043</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0.101</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>0.075</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>0.084</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0.068</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0.062</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>0.055</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>0.064</td>
<td></td>
</tr>
</tbody>
</table>

The total number of citations and journal’s self-citations received by a journal’s published documents during the three previous years. Journal self-citation is defined as the number of citations from a journal citing articles to articles published by the same journal. External citations are calculated by subtracting the number of self-citations from the total number of citations received by the journal’s documents. Cit Y V I % International Collaboration International Collaboration accounts for the articles that have been produced by researchers from several countries. The chart shows the ratio of a journal’s documents signed by researchers from more than one country; that is including more than one country address.

<table>
<thead>
<tr>
<th>Year</th>
<th>International Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>0.00</td>
</tr>
<tr>
<td>2000</td>
<td>0.00</td>
</tr>
<tr>
<td>2001</td>
<td>0.00</td>
</tr>
<tr>
<td>2002</td>
<td>0.00</td>
</tr>
<tr>
<td>2003</td>
<td>0.00</td>
</tr>
<tr>
<td>2004</td>
<td>0.00</td>
</tr>
<tr>
<td>2005</td>
<td>0.00</td>
</tr>
<tr>
<td>2006</td>
<td>0.00</td>
</tr>
<tr>
<td>2007</td>
<td>0.00</td>
</tr>
<tr>
<td>2008</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Citable documents Non-citable documents Not every article in a journal is considered primary research and therefore not counted as a citation. The number of citations received by a journal’s published documents during the three previous years.
efor e "citable", this chart shows the ratio of a journal’s articles including substantial research articles, conference papers, and reviews in three-year windows vs. those documents other than research articles, reviews, and conference papers. Documents Year Value Cited documents Uncited documents Ratio of a journal’s items, grouped in three-year windows, that have been cited at least once vs. those not cited during the following year.

Documents Year Value Uncited documents 1999 89 Uncited documents 2000 158 Uncited documents 2001 201 Uncited documents 2002 225. Show this widget in your own website Just copy the code below and paste within your html code: 


Ecology, Environment and Conservation is published in March, June, September and December every year. ECOLOGY, ENVIRONMENT AND CONSERVATION is one of the leading International Environmental Journal.

It is widely subscribed in India and abroad by Institutions and Individuals in Education and Research as well as by Industries, Govt. Departments and Research Institutes. Ecology, Environment and Conservation is in Master Journal List of ISI (Thom


Suresha, Saudi Arabia 29. Dr. Amresh Chandra Pandey, Jharkhand, India 30. Dr. Shambhu Sharan Kumar, Ranchi, India 31. Dr. A.K. Panigrahi, Berhampur, India 32. Dr. Ahmed El Mahmoudi, Saudi Arabia 33. Dr. Seyed Mohammad T ajbakhsh, Iran 34. Dr. Amin L. Setyo, Indonesia 35. Dr. Francis Gbogbo, Ghana 36. Dr. S.


Napolskikh 1482–1491 Function of a temporary wetland for wintering anatidea and coot: Mekhada Marsh (North East Algeria) —Rima Bendjeddou, Zahra Benyacoub Brahmia and Slim Benyacoub 1492–1500 Review and Implementation of the accident analysis methods (AAM) in the Oil and GAS Upstream sector —Nikolaos Georgakopoulos 1501–1507 Determining crop planting pattern and sorting base on priority farmers’ subjective —Parisa Shahinrokhsar, Amin Alizadeh, Hossein Ansary and
Mohamad Ghorbany 1508–1514 Soil contamination and assessment of heavy metals near two landfills area due to leachate migration — Tafë Veselaj, Rifat Morina, Afrim Berisha, Valdet Gashi and Fatbardh Sallaku 1515–1522 Ecotourism model based on social asset (Halal Tourism) as the strengthening of economy of Lombok community, Indonesia — Wildan and Sukardi 1523–1529 Riple harmonization of transcontinental allometric of Picea spp. and Abies spp.

forest stand biomass — Vladimir Andreevich Usoltsev, Seyed Omid Reza Shobairi and Viktor Petrovich Chasovskikh 1530–1534 Preliminary study single stage micro gas turbine integrated with South Sumatera Indonesia low rank coal gasification — Fajri Vidian, Hasan Basri, Helmy Alian, Elian Zhafran and Thorik Aziad 1535–1540 Results of preliminary studies on the production and agricultural crops research of ”JAMB - 70” polycomponent mineral fertilizers — Zh. N. Rakhmanberdiyeva, K. T.

Zhantasov, Z. K. Myrzaliyeva, B. R. Naimanbayev and D.M. Zhantasova 1541–1547 Spatial modeling vocational education development to support regional potential — Agus Wiyono, Abdul Hakim, Endah Setyowati and Agus Suharyanto 1548–1556 Evaluation of conditions for effective agricultural land-use as a basis for sustainable development of plant-growing production in the Omsk Region — Yuri Mikhailovich Rogatnev, Olga Nikolaevna Dolmatova, Vitaliy Viktorovich Aleschenko, Marina Nikolaevna Veselova and Yulia Stanislavovna Yusova 1557-1562 The monitoring of San Jose scale (Homoptera, Diaspididae: Quadraspidiotus perniciosus Comstock, 1881) in the southeast of Kazakhstan — Z.B. Beknazarova, B. Lozowicka, B.K.


Shorabaev 1592–1601 Feasibility study of cantrang (Danish Trawl): fisheriesbiology perspective —Sri Suro Adhawati, Achmar Mallawa, Aris Baso and A.

Adri Arief 1602–1608 Immune -phytopathological assessment of resistance of wheats to stem rust in conditions of the Southeast of Kazakhstan —Z. Amanageldikzy, A.S. Koghorov, Aziz Karakaya, A.I. Morgunov, R.D. Karbozova and M.A. Gabdulov 1609–1616 Changing the properties of cultivated land is a real basis for the formation of new environmental niches —I.S. Belyuchenko and O.A.

Melnik 1617–1623 The influence of seeding time on growth development and productivity of sunflower in the dry steppe area —Beybit Nasiyev, Nurbilat Zhanatalapov and Alexander Bushnev 1624–1629 Effects of human pressure on the distribution of Macaca sylvanus in the sector of Ait ouabane, National Park of the Djurdjura, Algeria —Mohammed Oudahmane, Aissa Moali and Farid Bekdouche 1630–1633 Carbon dioxide (CO 2) absorption of several landscape plants through photosynthetic route —F.


Mirzadinov, A. Aksoy, A. Abulgaziyev and G. Kanat 1657–1663 The study of the importance of cytogenetic and molecular genetics in the diagnosis of fish diseases —Mohsen Shokohinia 1664–1668 Studying the technology and methods of increasing the yield of cultivated plants on strongly saline soils —Aliya Ainabekovna Ismailova, Ashimhan Toktasynovich Kanaev, Nariman Zhalgassuly, Mahaya Aisijiang and Alexander


Latha, P. Partheeban and R. Ganesan 1760–1766 Problem associated with breeding of two commercially important catfish Clarias magur (Hamilton, 1822) and Heteropneustes fossilis (Bloch, 1974): alternative approaches for solution — Pradip Kumar Maurya, Shubham Gupta, Arvind Kumar Verma and Sullip Kumar Majhi 1767–1775 In-vitro efficacy of fungicides, bioagents and plant leaf extracts against Sclerotium rolfsii causing
collar rot disease of french bean (Phaseolus vulgaris L.) —Ashwini Kumar, N.


Ciurcanu 1785–1793 Impact of sub watershed implementation at Pandoga in swan river catchment area of shivalik foothills H.P, India on life form and biological spectrum — Bindu Sharma, Sujata Bhattacharya and Sunil Puri 1794–1806 Investigation of physicochemical parameters to assess groundwater quality due to solid waste dumping - A case study —P. Vijayalakshmi and Marykutty Abraham IV CONTENTS Eco. Env. & Cons.


Dhasarathan 1843–1846 Modelling of hybrid energy systems for renewable energy conservation and pollution control —S. Arulanantha Samy, S. Venkatesh, S.Vasanth and P. Satyanathan 1847–1854 Madhav national park: A potential site for vulture in Bundelkhand region —Ruby Yadav, Adesh Kumar and Amita Kanaujia 1855–1858
Isolation, screening and identification of cellulose producing bacteria from rotten fruits — N.C. Tharavathy and M.H.


24 (4) : 2018 CONTENTS V 1924–1930 Augmenting water stress tolerance in Tomato by silicon supplementation — Chanchal Malhotra, Riti Thapar Kapoor, Deepak Ganjewala and N. B. Singh 1931–1939 Assessing public awareness level on the preservation of coral reefs (The case study in Biak Numfor, Papua, Indonesia) — Lis Melissa Yapanto and Meilinda Lestari Modjo 1940–1944 Model multivariate adaptive regression spline on lead exposure found within the hair of Petrol station’s workers in Gorontalo City, Indonesia — Herlina Jusuf 1945–1953 Flood disaster preventive measures using GIS and multicriteria technique in the water sheds area of Ambasamuthiram Town — M.


forest stand biomass — Vladimir Andreevich Usoltsev, Seyed Omid Reza Shobairi and Viktor Petrovich Chasovskikh Article-70 Eco. Env. & Cons. 24 (4) : 2018; pp. (1940-1944) Copyright® EM International ISSN 0971–765X Model multivariate adaptive regression spline on lead exposure found within the hair of Petrol station’s workers in Gorontalo City, Indonesia Herlina Jusuf Faculty of Public Health, Universitas Negeri Gorontalo, Indonesia (Received 5 June, 2018; accepted 20 August, 2018) ABSTRACT MARS (Multivariate Adaptive Regression Spline) is one of the non-parametric regression models that employs modified recursive partitioning algorithm.

This study applied MARS model in the data of Lead (Pb) exposure in the workers’ hair at the petrol station in Gorontalo City, Indonesia. The study is intended to investigate the content of Lead in one’s body. The results of the study reveal that the MARS model in the Lead exposure in the workers’ hair at the petrol station in Gorontalo City consists of

\[ Y = 1.93593 - 0.219669 \times BF8 - 0.0220152 \times BF13. \]

Based on that MARS model, there are only three variables out of 10 assumed to affect the Lead exposure in the workers’ hair at the petrol station in Gorontalo City including the working time, disease symptoms, and age. Key words: Multivariate, Adaptive, Regression, Spline, Lead exposure, Hair. Introduction Time series modelling is usually found in sufficiently stationary and linear data by application of Autoregressive Integrated Moving Average (ARIMA) method for prediction (Arsyad, 1999). This method is highly effective, and model that is highly suitable will be achieved when the two requirements above are met.

If the data could not fulfill the assumption, then the obtained model would not be complete in describing the pattern of the system behaviour, hence, unsuitable for
forecasting. Development of non-linear time series has been made through the introduction of several flexible methods in various applications, where Multivariate Adaptive Regression Splines (MARS) is one of them (Friedman, 1991).

Fluctuated and non-linear data and time series modelling to obtain the value of given period in the future was proposed through MARS approach, which was considered better than the stochastic model (Buja, Duffy, Hastie, Tibshirani, 2001). One of the chemical elements that are dangerous to human health is the heavy metal. There are several heavy metals that are toxic and acts as a pollutant in the environment such as mercury (Hg), lead (Pb), Cadmium (Cd), and Cuprum (Cu).

The lead that polluted the air can come from the burning residue of additive substance from the motor vehicles’ fuel. The lead particles in the air can also come from other sources such as Alkyl Pb factory and Pb-oxide, coal burning, etc (Sunu, 2001). The lead polluted air can enter the body through inhalation process. Most of the inhaled lead will enter the blood vessels in the lungs.

Level of lead’s absorption is heavily influenced by the size of the lead particle and the inhaled blood volume during the breathing process. The lead inhaled into the lungs will be absorbed and HERLINA JUSUF 1941 chained with blood in the lungs to further be distributed to all tissues and organs. In tissues or organs, the inhaled lead will be accumulated within the bone. Regardless, to the small amount of inhaled lead, this metal can be hazardous.

This was due to the lead compounds that are toxic to many functions of the body organs (Palar, 1994). The other mechanism for the lead to enter the human body is through oral or direct contact with the skin surface. About 40% of lead within the body which comes from inhalation process is absorbed into the respiratory system.

About 5-10% of the lead compounds were absorbed into the gastrointestinal tract (Naria, 2005). The danger of the inhaled motored-vehicles’ emission has a long-term effect on human body. The emission that contained lead is found in vehicles that used leaded-fuels as anti-knock compounds.
The lead element in the body can be deposited into the soft tissues (bone marrow, nerve systems, kidney, and liver) and hard tissues (bones, teeth, nails, and hair). The lead element within the soft tissues is toxic within that soft tissues itself (Ardiyanto, 2005), whereas the intrusion of a large quantity of lead into the human body could cause kidney failure (Soesanto, 1998).

It can also cause cancer, problems in peripheral and central nervous system, digestion system, and reproduction system (Ardyanto, 2005). Also, in a pregnant woman, lead can penetrate the placenta and enter the blood circulation of the fetus. The lead will be disposed of with the breast milk after the baby was born (Palar, 1994). There has been extensive research on the level of lead within the body.

However, the focus of this investigation is on the petrol’s station workers in Gorontalo regency. Therefore, a research to find out the level of lead accumulated within the petrol station workers’ body is needed. Lead Found in Hair Hair is a solid structure which consists of solid keratin cells from made from epidermis follicles which shaped like a bulb that grows into the dermis layer. Normal and healthy hair looks shiny, elastic, and not easily broken, as well as absorbs water. Hair composition consists of 50.60% of carbon, 6.36% of hydrogen, 17.14% of nitrogen, 5.0% of Sulphur, and 20.80% of oxygen (Pusponegoro, Erdina H.D, 2002).

Hair is also one of the skin adnexa that spread along the body except for the palm of the hands, soles of the feet, nails, and lips (Soepardiman, Lily. 2002). There are two generic types of hair in the human body, terminal hair, the pigmented hair that grows on the head, brow, eye lashes, and in the pubic regions, and vellus hair, the least pigmented hair that grows in almost all body parts. (Soepardiman, 2002).

In the human body, the lead will be disposed through the various mechanisms, including through hair. Considering that hair reflects more on the level of a heavy lead pollutant that has entered the body (Kamal, 2007). This is because hair contains a lot of structural proteins that composed of cysteine amino acid that contains disulphide bonds (- S - S -) and cysteine containing sulfhydryl groups (- SH) with the ability to bind the heavy metals that enter the human body.
The level of tolerated lead in human hair is 127 g/g, in this level the toxin within the lead is not harmful (Palar, 1994). Factors that influence the level of lead in human hair are the length of exposure, age, genetic, and nutrition, hence, hair can be used as an indicator for the level of lead pollution in human and animal (Ashraf et al. 1995).

Multivariate Adaptive Regression Spline MARS is one of the non-parametric regression model which uses modified-recursive partitioning algorithm. The MARS modelling is preceded by three things below (Friedman & Silverman, 1989). i. Base Function (BF) is a function defined from each region. A maximum number of recommended base functions (BF) are 2-4 times of the number of the predictor variable. ii.

Maximum interaction (MI) is a number of interaction that happens on the model. The number of maximum interaction (MI) are 1, 2, and 3, if the maximum interaction used is more than 3, then the CGV value will increase and the model used will be more complex. If the maximum interaction used is 1, it means there is no interaction among variables within the model.

If the maximum interaction used is 2, then there is an interaction between two variables within the model. If the maximum interaction used is 3, it means that some interaction that happens within the model is mostly among three variables. iii. Minimum observation (MO) is a number of minimum observations among knots. A number of maximum interactions (MI) are 0,1,2, and 3, beyond this figure, the CGV will increase.

Establishment of the value of the base function 1942 Eco. Env. & Cons. 24 (4) : 2018 (BF), maximum interaction (MI) and minimum observation will influence the MARS model that will be developed. The multivariate adaptive regression splines (MARS) can be written in the following formula: $\hat{m} = m_{KM} m_{km} v_{km} m_{k} f_{x} S_{x t}$.

Research Method This study is an observational research with cross-sectional approach. This study is conducted on petrol stations’ workers that work in seven petrol stations in Gorontalo city with a total number of 48 workers. The samples are taken between 07.00 – 11.00 am because that period is the peak time for vehicles to fill their petrol tanks in these stations.
The testing of the hair samples is conducted in Balai Pengawasan Mutu Perikanan (fisheries quality control office, henceforth called as BPMP) of Gorontalo city. The population in this study is all the workers of petrol stations in Gorontalo city. Samples are taken using purposive sampling method based on several criteria. The samples’ criteria are as follow: (1) Age 20-40 years old; (2) Hair length minimum 5 cm; (3) Work tenure ? 2 years and (4) Volunteer to become respondents

Research Variables

The were three variables using of this research. These research Variables are: (1) Work Tenure. It is about the length of time where respondents, in their line of work have been exposed to lead. The longer the working tenure, the higher the risk to be exposed to lead. The objective criteria are short work tenure (? 2 years) and long work tenure (> 2 years); (2) Level of Lead (Pb). Number of lead accumulated in respondents’ body.

The tolerated lead exposure on human hair is ? 12 µg/g, hence, the toxicity is not severe (WHO, 1994). The objective criteria are nor- mal, when the lead level is ? 12 µg/g and abnormal when the level of lead is > 12 µg/g and (3) Health problems on petrol stations’ workers. Health concerns are often found in people who have been exposed to lead.

The target of this study is the lead in the hair of petrol stations’ workers in the area of Gorontalo city. Primary data are obtained through an interview with additional observation sheet that contains the questions such as the identity of the respondents (name, age, and respondents' work history, medical history).

The respondents’ hair specimens are collected and tested on the level of lead in respondents’ hair is conducted in the laboratory. Secondary data used in this study are data from BLHRD (Provincial Environment and Research Agency) of Gorontalo province, Samsat Office (Vehicle Registration office) of Gorontalo city, and Badan Pusat Statistik (statistical bureau) of Gorontalo Province.

Tool, Technique and Research Procedure

The method used in analysing the specimens in this study is Atomic Absorption Spectrophotometry (AAS). The samples are tested at BPMP laboratory of Gorontalo city. i. Tools and equipment • Hair scissor used to cut the respondents’ hair • Plastic bag • Observation sheet • Acetone and water • beaker glass •
volumetric flask • pipet • mortar and pestle • vial polyethylene • PC computer • Digital Scale • Kooling Module (KMS) or water cooling system • Atomic Absorption Spectrophotometry as tool of analysis • Blower • Petrol stations workers’ hair • Condensed Nitric Acid (HNO3) • Perchlorate Acid • Aqua dest ii.

Hair specimen collection technique Each respondent hair was taken 0.5 – 1 cm, then the hair is put into a labelled plastic bag. Respondents’ data are also collected, such as the name, age, and work tenure. i. Preparation Technique and AAS analysis Prior to hair specimens’ analysis, the specimens are washed with 100 mL of acetone and rinsed three times with water.

After that, the hair is washed using the acetone to get rid of the fat and other contaminants that might interfere other elements in hair. The specimens then dried. The specimen then destroyed to obtain a homogenous result. The result is then put into a vial, each specimen is given a label. HERLINA JUSUF 1943 Research Findings and Discussion In Mars modeling process, there are three things to be considered: the base function (BS), maximum interaction (MI), and minimum observation (MO). The base function (BF) is a function defined from each region.

The maximum number of recommended base function (BF) is 2-4 times of the number of the predictor variable (Friedman, 1991). The predictor variables that are suspected to influence the lead exposure are ten variables, hence, the number of base function that will be combined in the establishment of the model are 20, 30, and 40. Maximum interaction (MI) is the number of interaction that happens on the model.

The number of maximum interaction (MI) is 1, 2, and 3 (Friedman, 1991). If the maximum interaction used is more than 3, then the CGV value will increase and the model used will be more complex. Minimum observation (MO) is number of minimum observation among knots.

Number of maximum interaction (MI) is 0, 1, 2 and 3, beyond this figure, the CGV will increase. The establishment of MARS model is conducted through trial and error for all combination of the BF, MI, and MO values that have been previously determined. The possible models based on those combinations are 36 models.
From each of these modellings, GCV values will be produced and created predictor variables included into the model. The result is presented in Table 1 below. Based on the table above, the smallest GCV values are found in model number 11, 23, and 35. Because these three models yield the same result, the model with the smallest MI and MO values are selected.

Hence, the chosen model is model number 11, where the value of GCV is 0.08952 with the combination of BF=20, MI=3 and MO=2. The MARS model equation is \[ Y = 1.93593 - 0.219669 \times BF_{8} - 0.0220152 \times BF_{13} \text{ where, } BF_{6} = (x_{5} \text{ in (1) )}; BF_{8} = (x_{10} \text{ in (2) )} \times BF_{6}; BF_{13} = \max (0, 39 - X_{1}) \times BF_{8}; \] From this model, it is clear that out of ten variables that are assumed to have an influence on the model, only three variables that are proven to have an influence on lead exposure.

Because the best model is a model with maximum two interactions, it is suspected that there are factors that are interacting with one another. This model consists of one intercept (base function master) and three base functions that consist of two level-2 interactions. To examine the variables that influence the lead exposure, interpretation of the MARS model is presented below.

Interpretation of this MARS model is quite tricky because the base function in this model consists of not only one variable, but there is also the interaction between variables. \[ BF_{8} = (x_{10} \text{ in (2) )} \times BF_{6}, \text{ where } BF_{6} = (x_{5} \text{ in (1) It means that } BF^{*} \text{ coefficient will be meaningful if respondents were indicated to have some complaints and the length of work shift in petrol station was less than eight hours, then each unit increase in base function } BF_{8} \text{ will decrease the lead exposure Table 1.} \]

Trial and Error Result for All BF, MI, and MO Combinations

<table>
<thead>
<tr>
<th>BF MI MO</th>
<th>GCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 20 1 0</td>
<td>0.11958 2 20 1 1 0.11905 3 20 1 2 0.11888 4 20 1 3 0.11905 5 20 2 0 0.11518 6 20 2 1 0.09693 7 20 2 2 0.10564 8 20 2 3 0.09838 9 20 3 0 0.11553 10 20 3 1 0.10139 11 20 3 2 0.08952 12 20 3 3 0.09931 13 30 1 0 0.11933 14 30 1 1 0.11871 15 30 1 2 0.11856 16 30 1 3 0.11892 17 30 2 0 0.11518 18 30 2 1 0.09693 19 30 2 2 0.10564 20 30 2 3 0.09838 21 30 3 0 0.09838 22 30 3 1 0.10139 23 30 3 2 0.08952 24 30 3 3 0.09931 25 40 1 0 0.11933 26 40 1 1 0.11871 27 40 1 2 0.11856 28 40 1 3 0.11892 29 40 2 0 0.11518 30 40 2 1</td>
</tr>
</tbody>
</table>
0.09693 31 40 2 2 0.10564 32 40 2 3 0.09838 33 40 3 0 0.11553 34 40 3 1 0.10139 35 40 3 2 0.08952 36 40 3 3 0.09931 1944 Eco. Env. & Cons. 24 (4) : 2018 by 0.219669 percent.

- BF13 = max (0.

39 - X1) * BF8, where BF8 = (×10 in (2) * BF6 and BF6 = X5 in (1) It means that coefficient BF8 =13 will be mean- ingful if the respondent’s age were less than 39 years old and indicated health complaint and length of work shift in petrol station was less than 8 hours, then each unit increase in base function BF8 will decrease lead exposure by 0.0220152 percent.

Mars modelling in this study showed that there are interactions among predictor variables, which in turn influence the responds’ variables as shown in the following table

| Interaction | BF Interaction 8 Indicated to have health complaint and length of work shift in petrol station | 13 Age indicated to have health complaint and length of work shift in petrol station predictor’s variable contribution toward the MARS model. Level of predictor’s variable importance in grouped function is calculated by the increase in GCV value. |

| Tabel 3. Level of Predictor’s Variable Importance | Variable | Level of Importance | GCV Work tenure | 100.00000 | 0.14486 | Indicated health complaint | 100.00000 | 0.14486 | Age | 38.43010 | 0.08373 |
|-------------------------------------------------|----------|---------------------|----------------|------------|-----------------|-----|----------------|------------|----------------|-----|----------|----------|
| Table 2. Interaction in Base Function BF Interaction 8 Indicated to have health complaint and length of work shift in petrol station | 13 Age | indicated to have health complaint and length of work shift in petrol station predictor’s variable contribution toward the MARS model. Level of predictor’s variable importance in grouped function is calculated by the increase in GCV value. |

The increase of GVC value is due to the migrations of considered variables within the model. The importance level of predictor’s variable is shown in the following table. Table 3 shows that work tenure in petrol stations and health complaint indication have the biggest contribution by 100% in determining the lead expo- sure risk.
The second contributed variable by 38.43% is the age of the respondents. Conclusion
Based on the findings and analysis discussed above, the following things are concluded
in this study: MARS equation model obtained is: \( Y = 1.93593 \)

INTERNET SOURCES:
-------------------------------------------------------------------------------------------
analysis-on-causal-w-sjr.pdf
<1% - https://www.texasgop.org/wp-content/uploads/2018/06/PLATFORM-for-
voting.pdf
<1% - https://www.uschamber.com/sites/default/files/legacy/international/mideast/files/uscha-
mberriraqbusinessinitiativemission.pdf
<1% - http://www.fao.org/docrep/017/i3225e/i3225e.pdf
<1% - https://www.researchgate.net/publication/229118655_Landscape_evolution_space_and_t-
he_relative_importance_of_geomorphic_processes_and_controls
1% - https://www.researchgate.net/publication/329402772_TRIPLE_HARMONIZATION_OF_TR-
ANSCONTINENTAL_ALLOMETRIC_OF_PICEA_SPP_AND_ABIES_SPP_FOREST_STAND_BIO-
MASS
<1% - http://europepmc.org/articles/PMC2999420
<1% - https://sullipkm.weebly.com/publications.html
CERTIFICATE OF ORIGINALITY

To Whom It May Concern:

This is to certify that the following document has been checked for originality with premium plagiarism checker. The result is as follows:

<table>
<thead>
<tr>
<th>Originality Report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document Title</strong></td>
</tr>
<tr>
<td><strong>Author(s)</strong></td>
</tr>
<tr>
<td><strong>Similarity Found</strong></td>
</tr>
<tr>
<td><strong>Statistics</strong></td>
</tr>
<tr>
<td><strong>Remark(s)</strong></td>
</tr>
</tbody>
</table>

Internet Sources

<1% - http://www.fao.org/docrep/017/i3225e/i3225e.pdf
Date: Wednesday, January 23, 2019

Novriyanto Napu, M.AppLing., Ph.D.
Director