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Research Article **Published Date:- 2017-10-09**

Cumulative Effect Assessment: preliminary evaluation for Environmental Impact Assessment procedure and for environmental damage estimation

The paper presents and develops the issue of Cumulative Effect Assessment (CEA) in the Environmental Impact Assessment (EIA) screening procedure established by the State and Regional regulations In Italy. In the period 2001-15 in the territory of the Venice province (north east Italy, Veneto region) n. 328 projects (and the related environmental preliminary/definitive studies) were applied to competent Authorities (6% to the State, 39% to the Region and 55% to the Province). All the Environmental Impact Studies (EISs) and Environmental Preliminary Studies (EPSs) referring to the this territory officially applied to competent Authorities in the period 2001-2010, have been analysed with focus on the identification and assessment of cumulative effects (CEs); the projects considered and analysed for this purpose comprise a total of n. 181 EIA screening and ordinary procedures; the remaining 147 projects in the period 2011-15 (for a total of 328) are here considered only for statistical reason to an update assessment of project typologies in the same territory.

The methodology applied for the analysis of the sample of environmental studies in the period 2001-10 refers to that presented by Cooper and Sheate (2002) with modifications. The investigation has been developed looking for the way in which the topic is performed by practitioners in the environmental studies as from qualitative as well as quantitative point of view. Specific attention has been paid to waste management plants which are always subject to EIA screening procedure since 2008 according to Directive 97/11/EEC and in case to the whole EIA procedure. The approach proposed by Lombardia Region (North Italy; 2010) for EIA screening procedure of waste management plants has been applied to identify CEs and modified according to the characteristics of the considered territory; it allows the performance of the project-based approach and must be completed with a regional-based approach (Dubè, 2003). The proposed approach can be useful in case of waste management and IPPC (Integrated Pollution Prevention and Control, Directive 96/61/EEC, amended with Directives 2008/1/EC and 2010/75/EU) plants to define the financial warranties required for the authorization of operative activity of the plants to cover potential environmental damages produced in cases of accidents and other conditions as required in Europe (art. 14 Directive 2004/35/EC on environmental liability).

Several project categories were chosen and their EISs analysed as an exemplificative case according to the potential generation of cumulative impacts and the characteristics of the territory. With reference to the completed procedures where the competent Authority presented a final judgement, it has been observed that the CEA has been seldom developed due to not compulsory legal requirements as already observed by Burris and Canter (1997). Moreover, when it is considered, the methodology is limited and not systemized. Indices of impact have been identified according to emission for the main environmental components focussed with the analysis of the pressure factors of the plants. The study points out the need to analyse and evaluate the cumulative effects (CEs) at a strategic level (within the Strategic Environmental Assessment-SEA- procedure) with a view to preparing the study for EIA/EPS framework procedure for the projects derived from the corresponding plan/program. A sound knowledge of the considered territory and in particular of its pressure sources is of main importance for CEA assessment and impacts' prevention. Geographic Information Sytesm (GIS) application is strongly needed for pressure sources' census and control data storing

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Research Article **Published Date:- 2017-10-06**

Rapid Microbial Growth in Reusable Drinking Water Bottles

Bacteria has been known to grow in pipes of water distribution systems and bottled drinking water. Its growth in reusable drinking water bottles is not clear even though they have become more popular and used by children and adults daily everywhere. This study found that there is an extremely high level of bacteria content and a rapid microbial growth in reusable drinking water bottles. The bacteria content tested by heterotrophic plate count (HPC) is in a range of 0-2.4x105 CFU/mL with an average of about 34,000 bacteria counts/ml for bottles used by children and 75,000 bacteria counts/ml for bottles used by adults. Bacteria number can quickly increases to 1-2 million counts/ml in the bottles one day later. Considering the high level of HPC bacteria content in the reusable drinking water bottles, it may be necessary to have some control measures to reduce the bacteria level and to minimize the associated likely health risk of the disease spreading since many people use reusable water bottles every day.

Review Article **Published Date:- 2017-06-29**

Natural and effective ways of purifying lake water

Water resources play an integral part in the life of a living being. The various water resources that are present on the earth's surface are in the form of oceans, seas, lakes, rivers, ponds, waterfalls etc. Among these water resources Lakes and reservoirs are vital for people's life, industrial activities and many other day to day activities. These water resources help in obtaining water for drinking after being treated. They also provide water for agriculture and industrial usage, fishery resource, flood control functions and many other activities. Due to the closed nature of lakes', the waste material from sewage, agricultural effluents, domestic and industrial fields, gets accumulated around the surface of these water resources and once the water gets polluted, it gets strenuous to improve the quality of the water. In the study, the authors have examined different effective ways by which the quality of lake water can be improved.

Research Article **Published Date:- 2017-06-29**

Hydraulic jump experiment in a rectangular open channel flume

This paper presents a laboratory experiment for the formation of hydraulic jump in a rectangular open channel flume to accurately explore the effect of flow structures on water resources. This experiment illustrates the behavior of super-critical flow under sluice gate for various flow rates and downstream depths. Several runs are carried out using Armfield Model No. C4-MKII-5.0-11 to investigate the former computations concerning both the downstream conjugate depth and the critical depth resulting within the jump. Moreover, the model is examined to explore the sensitivity of Froude number by adjusting the flow-meter and over-shot weir in the flume. Also, the type of jump attributed to flow velocity can thus be obtained. Furthermore, both location of hydraulic jump and energy dissipated are discussed under the influence of different gate openings

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Research Article **Published Date:- 2017-05-17**

A Preliminary Laboratory Investigation of Methane Generation Potential from Brewery Wastewater using UASB Reactor

A preliminary laboratory study was conducted using upflow anaerobic sludge blanket (UASB) reactor to investigate the potential of methane generation from brewery wastewater. Brewery wastewater from a local brewery company was collected and used in the experiments. The experiments were run for 15 days. The rate of methane production was about 5.32 L per kg of chemical oxygen demand (COD) removed per day. The pH reduction in the experimental reactor limited the ability of gas production and is likely the result of the temperature at which the experiments were conducted.

Research Article **Published Date:- 2017-03-31**

Wave Forces on Vertical Structures in Shallow Water: Numerical Evaluation

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The actions exerted by waves on a coastal structure very much depend upon hydrodynamic processes that originate on shallow waters; even though significant progresses have been made in the last few years towards a full understanding of wave breaking, design work is still largely based on classical stability formulas. The recent availability of reliable models based on the numerical integration of full Navier-Stokes equations provides an important tool, but the evaluation of forces on vertical structures in shallow waters is still a particularly delicate application because of the complex hydrodynamic issues involved.

The paper presents deals with the numerical simulation of wave effects on front of a vertical obstacle on a sloping bottom, with the objective of clarifying some physical issues which are relevant towards the applicability of numerical Navier-Stokes simulation as a design tool.

Research Article **Published Date:- 2017-03-24**

Thermal Stress Analysis of a Continuous Rigid Frame Bridge

Thermal stress of a continuous rigid frame bridge, based on the temperature gradient in Chinese bridge gauge, using a finite element analysis (FEA) method was investigated. First of all, the temperature effect of the whole bridge was analyzed, and the correlation of the improved amplitude of temperature gradient and temperature effect were studied. It was found that there was a linear relationship with temperature stress and improved temperature. And then, the temperature effect of zero block was analyzed and the details of box girder temperature stress distribution investigated by utilizing the FEA method. It was concluded that temperature stress mainly distributed in the body surface; under the condition of the improvement of temperature field, the center temperature stress of zero block was improved about 60% and the end temperature stress of zero block was improved about 75%.

Research Article **Published Date:- 2017-01-11**

Removal of Chromium from Aqueous Solution by Thermally Treated Mgal Layered Double Hydroxide

MgAl based layered double hydroxide (MgAl-LDH) was used as adsorbent for the removal of chromium oxyanion from an aqueous solution. MgAl-LDH was synthesized successfully using co-precipitation method, and was characterized by X-Ray Diffractometer (XRD), Scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM-EDX). MgAl-LDH was thermally treated for improving the chromium adsorption. Samples were treated at 220°C and 450°C. A negligible difference of total chromium adsorption capacities was observed between $MgAl\text{-}LDH_{000}$ and $MgAl\text{-}LDH_{220}$ as 12.56 mg/g and 11.01 mg/g. The maximum chromium adsorption capacity of MgAl-LDH was 88.07 mg/g at 500g/l chromium concentration for MgAl-LDH which has been thermally treated at 450°C ($MgAl\text{-}LDH_{450}$). The results indicated that memory effects of thermally treated MgAl-LDH at certain temperatures were retained and enhanced chromium removal efficiency.
