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Assessment of the impact of diuron to water bodies in the Walawa area

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Use of pesticides has significantly increased global food production and it is indispensable in modern agriculture to control weeds, insects, other pests and diseases. As the population increases the use of pesticides also increases. The impact of these pesticides to the environment is not well understood for Sri Lankan conditions Hence the sorption pattern of a non ionic pesticide, diuron {3-(3,4-dichlorophenyl)-1,1-dimethylurea; $C_9H_{10}Cl_2N_2O$} which is used as a herbicide to control weeds and mosses mainly in sugarcane, was studied for 14 soil series in the right bank of the Walawa basin in Sri Lanka.

Information was collected from farmers in Walawa areas on crops, historical cropping patterns, type of pesticides used, pesticides handling knowledge etc. The survey revealed that pesticides use is malpracticed by farmers. The distribution of crop types in the area during last three years shows that Paddy, which is scattered through out the area, is the most prominent crop. The average area under paddy cultivation is approximately 9800 ha. Banana was the second highest grown crop that is in about 4200 ha. Sugarcane, which covers about 2500 ha, is the prominent monoculture in the Walawa basin.

Adsorption of diuron to the collected surface (0-10cm) soils of the 14 soil series in the Walawa basin were measured using High Performance Liquid Chromatographic method. The Moraketiya series showed the highest sorption among them. It also gives the highest Kd value of the selected soils and Sivambala series exhibited the lowest adsorption and Kd. The organic carbon content was highest in Kachigalara series and it was lowest in the Walawa series. The measured Kd values were used to predict the risk of this pesticide to ground and surface water in the Walawa area using a simple management model called Pesticide Impact Rating Index, PIRI which resulted a moderate risk for the contamination of water bodies in the area.

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Environmental impacts on waste and water disposal from abbatoirs and poultry processing units in Weligama area.

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Selling of Meat is one of the popular businesses among the Muslim community in the Weligama area. Therefore, the objective of the present study was to collect baseline data on the waste and water disposal methods and sanitary measures in abattoirs and poultry farms in the area. Selected abattoirs and poultry farms were visited to monitor the prevailing conditions and advice abattoirs and poultry farmers how to improve the standards in their working places. The results of this study revealed that all the abattoirs possess experience but little skill, knowledge and technology. All the visited abattoirs are situated close to residential areas, especially close to water bodies such as wells and streams. The reason is that the abattoirs need lot of water for cleaning and other purposes. Animals were killed on the floor just after cleaning with water. Approximately 100-150 kg meat was processed daily. The carcass recovery percentage was 50%; thereby waste generated was also 50% of the live weight of the animal. Approximately half of the waste contained bones, buried and used as fertilizer at a latter stage. Inedible parts of the digestive track and undigested material also buried, however, very close to the proximity of residential areas. The amount of water used was around 80-100 l/day but no proper way of disposing polluted water as it directly goes to drains, streams and opened wells etc. It was also observed that all the poultry cages and processing units were located very close to residential areas. Around 300 kg of poultry meat was produced daily. The carcass recovery was around 70-75% while the amount of waste generated was 25-30% of the live weight of a bird. Average waste material generated from a processing unit was around 75 kg/day. The offal's were properly disposed due to collection by the urban council for compost making. It prevents environmental pollution and health

hazards due to accumulation of offal and other wastes. Some processors were not involved in above programme and buried their wastes but complained that they do not have enough area for waste disposal.It is concluded that poultry processing involve with proper waste disposal methods. However, abattoirs use very unhygienic methods for waste disposal while no attention was focused on water pollution as well. Therefore, it is utmost important to educate the abattoirs for proper waste and water management techniques in order to minimize the environmental hazards.

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Colour removal and its mechanisms in textile wastewater treatment by UASB reactor system with anaerobic granular sludge

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Textile wastewaters generated from different stages of textile processing contain various toxicants or pollutants that are seriously harmful to natural aquatic environment when released without proper treatment. Although there are different methods, which can be adopted for the treatment of textile wastewater, biological approaches are considered as environmentally friendly, low cost and effective methods over other physico-chemical methods. In the present study, simulated textile wastewater (STW) prepared by mixing of three popular acid dyes (Acid blue 204, Acid red 131 and Acid yellow 79) in synthetic wastewater was studied for the decolourization and removal of degradable organic in the laboratory scale Upflow Anaerobic Sludge Blanket Reactor system with anaerobic granular sludge for about five months at different organic and dye loading rates. The colour removal mechanisms under anaerobic treatment were also examined since microbial colour removal occurs basically in two ways namely biological degradation, which is more important in textile wastewater treatment, and adsorption of dye molecules onto microbial biomass. Chemical oxygen demand (COD) removal of acid red 131 (AR131) containing STW was about 80% at 300 mg/l dye concentration and it was over 89% in acid yellow 79 (AY79) dye containing STW under studied conditions. Although acid blue 204 (AB204) showed a little inhibition over methanogenic consortia, about 93% of COD removal was observed at 100 mg/l dye concentration. Colour removal of AR131 dye containing STW was 95% and it was credited to biodegradation. Treatment of STW prepared using AY79 showed 95% colour removal owing to biodegradation while AB204 was quite resistant to biodegradation by anaerobic microorganisms. Observed colour removal was merely due to the adsorption of dyes onto microbial granules. Even though a little accumulation of volatile fatty acid (VFA) was observed in increased dye concentrations, the detected values of VFA, alkalinity and pH showed that those values were in the range of desirable limits of anaerobic process. It seems that AR131 and AY79 can be decolourized almost completely by UASB reactor system while AB204 cannot be decolourised since all colour removal attributed to adsorption of dye onto microbial granules. It can be concluded that anaerobic technology can be used for the treatment of textile wastewater containing different dyes as an alternative method over other methods. However, further study of UASB reactor for the treatment of real textile wastewater is suggested to find out matrix effect of other chemicals present in real textile wastewater before application to the real world situations.

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Status of heavy metal pollution in the Lunawa lagoon

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Distribution of five types of heavy metals in the Lunawa Lagoon (Colombo District) was investigated from April to June 2006. Water and bottom sludge samples were obtained at fortnight intervals from nine sampling stations of the lagoon including three drains (Northern, Eastern and Uyana). Water samples were preserved by adding Conc. HNO_3 (Analytical Grade) to adjust the pH to < 2 and bottom sludge samples were treated by 'Wet Ashing Method' before analysis. Concentrations of Cu,