

خاک و آب در مدیریت ضایعات زیست محیطی

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(خلاصه مقاله)

موضوع : خاک و آب در مدیریت ضایعات زیست محیطی

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(عرضه کننده تکنولوژی و ماشین آلات در صنایع
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مهندس صنایع و دانشجوی انستیتو مدیریت ضایعات

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تجارب گذشته جهان، گویای این واقعیت است که بسیاری از موقعیت های زیان بار، بعثت نقصان اطلاعات در رابطه با آب و خاک که بخشی از مهم ترین عوامل در اکوسیستم می باشند بوجود آمده است، و این منابع می بایست تحت پوشش یک برنامه کلی، ملی و جهانی مدیریت ضایعات زیست محیطی قرار گیرند.

از آنجا که تمامین آب شیرین محدود بوده، کیفیت خاک نیز از نقطه نظر کشاورزی اقتصاد و اکوسیستم بسیار مهم می باشد و زندگی بدون آب و خاک غیر ممکن است. سؤال اینجاست که، چه عواملی منابع ما را تهدید می کنند؟ چگونه می توان از آنها محافظت نمود؟ هزینه های مدیریت و کنترل آن چیست؟ چه سطحی از کنترل و آلودگی مجاز است؟ و بالاخره چگونه می توانیم منافع اجتماعی را در مجموع به حداکثر برسانیم؟

وظیفه ما آنست که با استفاده از اطلاعات همه جانبه در علوم بهداشت محیط زیست اکولوژی، بیولوژی، فیزیک، شیمی، سم شناسی، جانور شناسی، گیاه شناسی بیوتکنیک و سایر علوم مرتبط مشخص نماییم که خطرات جدی کجاست و پتانسیل و دامنه خطرات آلودگی و مدمات مربوطه چقدر است، چرا که هنوز اثرات بلقوه خیلی از مواد شیمیایی بر روی سلامتی و همچنین زیان های بلقوه بسیاری از ضایعات زیست محیطی روشن نیست و لذا مدیریت این اطلاعات امری پیچیده، پویا و بی پایان و مبارزه جویانه در ابعاد سیاسی، قانونی، و اقتصادی است.

ضایعات و آلودگی های مضر، از انباره های فاضلاب های صنعتی دفن شده و یا ضایعات حیوانی، کودهای شیمیایی و آفات، فاضلاب های صنعتی، مواد شیمیایی مورد مصرف در کشاورزی، فاضلاب های شهری و یا منابع آلودگی های انسانی نشأت گرفته و منابع عمده آلوده کننده آب می باشند. همچنین برخی نیز منابع آلوده کننده خاک بوده و بعلاوه، ضایعات دیگری از جمله فرمایش خاک کسیر باروری خاک و سایر جنبه های اکوسیستم اثر می گذارد و وجود دارند.

آبیاری تکنیک مفیدی، برای استفاده از منابع آبیاری زمین بوده و امروزه جنوب شرقی آمریکا از مهم ترین نقاط دنیا است که وسیعاً آبیاری شده و می شود اما باید در نظر داشت که آبیاری زیاد ممکن است باعث شود زمین بعثت شوری و رسوبات خسراب شود و لذا جوامع انسانی که در اطراف نواحی بیابان زدایی شده بوجود می آیند کوچ کنند.

ابزار مدیریت آب و خاک همچون سایر مسائل مدیریت ضایعات زیست محیطی عبارتست از آنالیز نسبی خطرات، آنالیز فایده و هزینه و مدیریت خطرات که در نتیجه می بایست هزینه های ضایعات زیست محیطی را حداقل نموده و منافع اجتماعی را حداکثر نماید و نقطه تصمیم گیری چسبایی است که منحنی هزینه کل کنترل و آلودگی به حداقل برسد. در حقیقت، استفاده مناسب از منابع محیط زیست غالباً موضوعی است اقتصادی تا موضوعی اخلاقی و آرمانی.

بظور کلی، هزینه های ضایعات زیست محیطی می توانند در سه رابطه سنجش شود که عبارتست از هزینه از دست دادن منابع، هزینه آلودگی ها و پیشگیری و کنترل آن و سوید ها و بالاخره هزینه های از دست دادن بهداشت و سلامت انسان و درمان بیماریا، سؤال اینجاست که چه کسی باید آن را بپردازد و چگونه باید منابع مالی را تامین کرد؟

In the name of God

(report in breif)

Subject : Soil & Water in Envirowaste Management.

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&

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The line of activity:

(Presenting Europe technology and machinery for
water and waste treatment)

Soil & Water in envirowaste management

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Past experience of the world tells us that many harmful situations have been involved in water and soil, as a part of ecosystem's most important items, because of lack of information, and it should be managed under a general national and world envirowaste management programme.

Since the supply of fresh water is limited and the quality of soil is very important in the ecosystem and agriculture as well as economical point of view, and life without water and soil is impossible, therefore, the questions are that why the problem of water and soil keep growing? What is endangering our sources? and how can we protect our water supply and soil quality? what is the cost of management and control? and what should be the level of control and the limited of dosage of pollution? and how can we maximize the social benefits.

Through an expanded knowledge of environmental health science, ecology, biology, physics, chemistry, toxicology, zoology, botany, biotechnology and other related sciences, we have to make decision, what is serious hazard, and what is the potential risk of pollution, as however the potential health effects of many chemicals, and potential loss of many envirowaste, is still unknown, and these data gaps introduce a measure of uncertainty and the need for risk management, which is complex, dynamic, immensely challenging for social, political, institutional and economic perspectives.

Hazardous wastes which have leached out of landfills animal wastes, fertilizer, herbicides, industrial waste agricultural chemicals, sewage and human organic wastes are the sources of pollution of water, and some of them is also sources for pollution of soil as well as some other sources for erosion of soil which will affect the fertility of soil, and other aspects of ecosystem.

Irrigation is a very useful technique to use the ground water sources today the American southwest is the most heavily irrigated area in the world, but heavily irrigation may destroy the land by salt seepage and wipe out societies that grow up around the man made oasis.

The management tools for water and soil management as well as any other envirowaste management is relatively risk analysis, cost benefit analysis, and risk management, which as a result should minimizing the envirowaste cost and maximizing the social benefits. The decision point is where the curve of total cost of control and pollution is in a minimum level and in fact the proper use of environmental resources is more a matter of economics than morals.

In general the cost of envirowaste can be measured as three items which are the loss of resources, cost of pollution, abatement and control and cost of loss of human life and of poor health, and the question is that who should pay for it? and how can it be financed?

References: Envirowaste Management Institute Of America
Reference subjects

Soil & water in Envirowaste management

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Introduction:

Past experiences through the world, tells us that because of lack of information and knowledge harmful situation has been involved in our environment especially in important items as water and soil. The envirowaste management is now developing to a recongized science, which through an expanded knowledge of environmental health sciences, ecology physics, chemistry, toxicology, humand physiology, biology, biotechnology, zoology, botany, and food science, should provide the envirowaste management policy. Hereinafter you will find some aspects of water and soil enviromental problems, and the envirowaste management decision tools.

Water and soil pollution:

Most of the earth's water is salt water and less than one percent of all water in earth is useable water in lakes, rivers, underground aquifers, so the supply of fresh water is limited but life is not possible without it. Natural water contains not only chemically pure water (H₂O) but dissolved gases, and solids and many living organism. So rather than discuss deviation from standard, constituents, scientists describe water as polluted if it is not suitable for an intended use. Concern over the quality and quantity of surface and ground waters, supplies is a function of geography as well as the effects of soil which due to human activity, and various natural processes can cause pollution to the soil and water sources.

Today the American southwest is the most heavily irrigated area, in the world transforming a desert into a veritable garden of Eden. But the omen is that haevily irrigation may destroy the land by salt seepage , and this is not an academic point, for example, the 1400 mile Colorado river which is the life blood of 17 million people and has made American western desert bloom, but this magnificent river is being slowly poisoned as it's water become more and more saline which comes from contact with the very saline. Western soil and salty mineral springs and by salt

Reference: Envirowaste Management Insitute subject references

concentration, which is caused by evaporation and the increase use of the river in seven states it serves on the other hand, a general accounting office study, in America finds that more than 50% of the irrigation water is wasted as water is evaporated out of irrigation canals at a rate sometimes as high as 50% and many large scale irrigation use the system of spraying water into air, instead of drip irrigation to save water.

Another tragedy in the countries using high irrigation is that it is using up waters that is vitally needed for future generations, for example three years ago times reported that the Ogallala aquifers the vast underground reservoirs of water that transformed much of the great plains into one of the richest agricultural areas of the world is being sucked dry, and a report by Boston engineering firm estimates that by the year 2020 some 2.1 million acres of irrigated land will dry in this area.

Considering the above mentioned, in respect to environmental waste management, the main questions are why the problem of water and soil keep growing? What is endangering our sources? How can we protect our water and soil quality and quantity? What is the cost of management and control? what should be the level of control and the limitation of dosage of pollution? and How can we maximize the social benefits while minimizing the cost of environmental waste.

Hazardous waters which have leached out of landfills animals wastes, fertilizer, herbicides, industrial waste agricultural chemicals, sewage and human organic waste are the sources of pollution of water and always through polluted soil, and the most important of them can be each of the followings:

1. Toxicity

Toxic and heavy metals can act as metabolic or respiratory blocks, in many organisms.

2. Deoxygenation

Which is due to biological process of organic materials. which reduces the available oxygen for other organisms which is almost under control by B.O.D factor.

3. Salinity

Whereas some organism can tolerate a certain range of salt concentration but it should be considered as a pollutant, to fresh

water, organisms.

4. Acidity

At a PH level of below 4.0 all vertebrates most invertebrates and many microorganisms, are eliminated.

5. Turbidity

Cutting down light transmittance enough to inhibit photosynthesis of both macro and microscopic water plants.

6. Phosphorus

Too much or too little is bad. Too little phosphorus results in very low productivity of aquatic systems, and too much leads to population explosions of plants and micro organisms, and this may cause shortage of nutrients and oxygen in water sources, as a result of population explosion of some species of algae.

7. Detergents

Which the most important effect of it is because of phosphorus problem.

8. Agricultural runoff

We are adding fertilization of farmlands, which 10-25% is almost leaching away into surface runoff, before the plants are able to use it, and this represents a loss to the farmer and a burden to aquatic ecosystem, because of phosphorus content.

The other agricultural sources of phosphorus is animal waste, agricultural chemicals which always contain toxic chemicals, and can affect our surface and ground waters.

9. Organic waste

However, severe pollution from organic matters, occurs in natural situation, or due to man's misuse of his environment by the release of untreated human and animal wastes and some industrial processing plants, which organic waste has through our most recorded history, typhoid epidemics, mere common place of centuries.

10. Industrial discharges and dumping of industrial waste which covering a range of pollution as radioactive isotopes poisons, pesticides, heat pollution and etc.

11. Biological pollution

Biological pollution causes disturbance to an ecosystem by directly influencing the relationship between component species population. There are also other sources of pollution as certain disinfectants used to purify water which can create potentially hazardous by-products as a good example is chlorine which can react with

natural and man made chemicals, in water to create some toxic materials. Also there is the risk of pollution, in water distributing system, in pipes and conduits. Acid rain as the other source of pollution is now very serious problem for water and soil.

Considering the above mentioned the envirowaste managment should be shared in a local, national , and international programme, to arrange a control system for serious hazards and we should also consider that the proper use of environmental resources is more a matter of economics than the morals, and also however, the potential health effect of many chemicals, are unknown, and these data gaps introduce a measure of uncertainty into nearly all discussions of the adverse effects of environmental pollutions. Therefore the management of these risks is complex dynamic, and immensely challenging from social, political, institutional and economic perspectives, and should take the opportunity, to integrate environemtal policies that allowing for mutual achievement of the respective goals of the agricultural, social environmental, and industrial community, safe and afforedable food , a prosperous agricultural and industrial sector , as well as stable productive ecosystem.

Using the envirowaste management procedures as a tool for soil and water management

As an envirowaste management, we should first, answer to a very important questions, as "what's a serious hazard ?" In answer to this question scientists almost considering the risks as following category:

A. Relatively high-risk ecological problems:

- Habitant alternative and destruction
(soil erosion, deforestation etc.)
- Species extinction and overall loss of biological diversity.
- Stratospheric ozone depletion
- Global climate change
(Green house warming)

B. Relatively high-risk to human health

As pollutant in drinking water outdoor air pollution , workers exposure to chemicals in industries.

C. Relatively medium risk ecological problems

- Herbicides and pesticides
- Pollution of surface water
- Acid deposition (Acid rain etc.)
- Airborne toxic substances

D. Relatively low risk ecological problems with very restricted range.

- Oil spills
- Acid runoff to surface waters
- Thermal pollution
- underground water pollution.

However, some of the philosophical thoughts being expressed for envirowaste management is as followings:

1. Cost vs benefit analysis, which is also of considerable value in determining whether pollution control should be undertaken and if so, which control methods should be used in general. The cost of pollution can be measured in three ways. First, we can measure the loss of resources through unnecessary wasteful exploitation, as for example, the destruction of fish through the pollution of rivers. Second we can measure the cost of pollution abatement, and control, like the charger we may pass on to the people by taxes buyers for some kinds of soil and water projects. Third, we can measure the cost of loss of human life and of poor health. As for example the relationship of water pollution to many health problems. However the social including economic costs of pollution are confusing because they are not usually explicit, and modern industrial societies do not normally include in their production costs the spewing of effluents into the air or the overloading of the land with solid waste. In this manner, they pass a hidden and heavy cost to the community.

In general the affluent countries can afford the luxury of restraints or prohibitions on the use of powerful welfare. Developing countries on the other hand, or underground waters, might rightly accord more importance to the well-being of their human population than that if their countries birds, population so it is unreasonable to expect that different countries should have common attitudes to environmental protection. However, in cost vs benefit analysis we should consider this points.

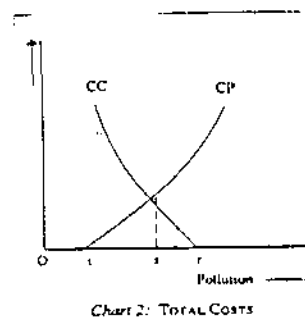
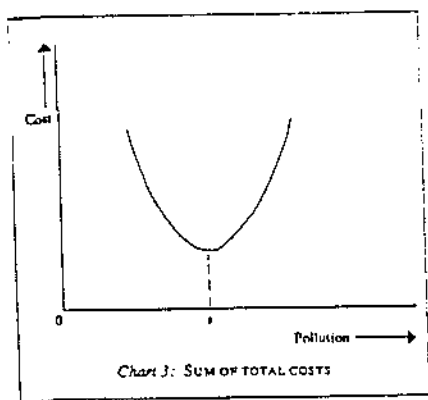
2. Risk characterization and risk assesement

It means that decision makers ultimately must relay an jundgement: Does the weight of the scientific evidence justify a regulatory decision or not?

3. Comparative risk analysis by mother, unborn baby, family, friends and government is also a very important step to evaluate the risk of alternatives.

4. Risk reduction, or waste reduction and minimization the cost of waste is the first step as a growing popular also waste recycling sources consuming reduction, and other measures are becoming more and more popular. For example , the pollution of underground water is based on many factors as the soil material, deeps and distances of underground water table quality and quantity of pollution, which after a risk assesement we may find some prohibitions and control costs are not necessary and some of the others are vital.
5. Risk management, as the final decision making process, will let to make a fair decision for any problem, to minimize costs and maximize benefits.

In this analysis two lists would provide the raw material for a rational setting of pollution standars, in one all the changes necessary to bering about a given alternation in the subject of control, and in the other all consequenaces that result from this alternation, If the items in each list could be assigned realistic quantitative values, (and we will assume for the moment that this is possible) the lists would represent two broad categories of costs. The first will be called the cost of control, although the second is clearly a list of the benefits, of control, which we can call it the costs of pollution since it represents the benefits foregone in the absence of control and we will have the chart A and if we draw the chart of total cost of pollution and cost of control, we will have the chart B, which indicates point as the minimum cost decision point.



However, the pollution is a by-product of living, for example construction of a dam will affect the ecological system but they are essential for providing energy and water for irrigation this being so, the genuine questions are how much pollution and other disturbances of the environmet shall we indulge in? but there is also another question, who should pay for environmental pollution? It is obvious that people look at the world from different view points reflecting different value systems, and often what becomes, the prevailing view of what is right is determined by the relative power of the definers. But when somebody pollutes environment and somebody has to clean it up, the clean up is added to the national product, and the pollution is not subtracted and this makes for bad book keeping, therefore, a system of payment of pollution cost by the related sources is very helpful and logical.