



OROCOM in Brief

OROKOM, is an NGO, with a focus on Water and Environment. OROKOM provides consultancy on a global basis with reference to Iraq. OROKOM scientific services include water quality indices, water resources management, oil spill contingency planning, environmental surveys, multi-disciplinary environmental assessments, environmental management, fish farming, biodiversity, wetlands ecology & management and others.

Professor Ali Douabul has been appointed as Chief Technical Advisor (CTA) to OROKOM. Professor Douabul together with the resort of experts and consultants is qualified to furnish the following services:

- Climate Change -Adaptation & Mitigation
- Water Management.
- Ground Water.
- Mining and Industrial Waste Management.
- Environmental Impact Assessment (EIA)
- Medical and Pharmaceutical Waste Treatment.
- Agricultural and Desertification Management.
- Green Belts.
- Mapping and Remote Sensing.
- Biodiversity Conservation and Protected Area Management.
- Capacity Building both Academic & Technical.
- Laboratory Analysis.
- Others....

OROKOM has several agreements with government agencies e.g. Water Recourse, Agricultural, Environment, Municipality, and others (under negotiations).

OROKOM has a rather strong field team consisting of Engineers, Scientists & Technicians. Please visit Iraq Water & Environment Group (IWEG) for updates.



OROKOM Network

 <p>Dr. Alan Ryder</p>	 <p>Dr. Eisa Alharatani</p>
 <p>Dr. Brian Helmuth</p>	 <p>Dr. Edward Maltby</p>
 <p>Dr. M. Man Baradi</p>	 <p>Dr. Mohamed Shariff</p>
 <p>Dr. Ashraf Ramadan</p>	 <p>Dr. Hulya Boyacioglu</p>
 <p>Dr. Maryam Chahwan</p>	 <p>Dr. Furat Al-faraj</p>
 <p>Dr. Muatz Al-Dabas</p>	 <p>Dr. Hany El Shaer</p>



OROKOM Collaborations

	
	<p>Feliks Victor Lacroix and/or Fundatia ESG Sustainable Economic</p>
	
<p>The Green Alliance Africa</p>	<p>Ecological Vision for Shkodr Region</p>



Selected Article: Dr. Sergey Derchuk

Waste Processing and Energy Production Without Emission

The Process in 7 Steps

WASTE LOADING

Waste is loaded into the sterilization chamber (manually in small machines or using an onboard automatic loader) in its original packaging, in plastic or cardboard bags or boxes, and the lid is closed.

CRUSHING

The rotor starts up and accelerates gradually as the material is shredded. At this point, the temperature quickly rises to about 100 ° C.

EVAPORATION

The heat generated by friction in the material causes the waste moisture to evaporate, and the temperature remains stable at about 100 ° C.

SUPERHEATING

When all moisture has been removed, the heat from friction causes the temperature of the material to rise to 151 ° C.

STERILIZATION OR PASTORIZATION

Temperature is maintained at 151 ° C for 3 minutes in damp heat with controlled dosage of water.

COOLING DOWN

The waste is poured with water to reduce the temperature of the material to about 100 ° C. Then a vacuum pump adiabatically lowers the temperature to 60 ° C.

UNLOADING

The processed material is discharged by centrifugal force through the opening of the servo-driven valve located at the bottom of the processing chamber.



Selected Essay: Dr.Maryam Chahwan

Reducing Construction Waste in Iraq

Construction Waste can be defined as any unwanted material that is generated as a result of construction activities taking place. In general, construction waste is estimated to make around 10 to 30 percent of the total waste being received to landfills across the world. [1] In the United States of America (USA) alone, around one third of the total volume of waste sent to landfill is coming from construction waste. Moreover, In Canada, construction waste accounts for around 35 percent of the total waste sent to Landfill. Likewise, the Middle East is also known to generate high volumes of construction waste each year. This is mainly due to the high rate of population growth that is coupled with economic expansion as well as urbanization. The gross urban waste generation for countries in the Middle East is estimated to be around 150 million tons each year. [2] Management of construction waste has therefore become an issue that is of international importance. The increase in population growth coupled with increase in economic growth in Iraq has led to challenges in waste management. It is estimated that, around 31,000 tons of solid waste including construction waste is generated each day per capita. Furthermore, several reports were identified for cases of illegal dumping which creates great tension for organizations to develop a framework in managing and reducing their construction waste effectively. As a result of the increase in volumes of construction waste being sent to landfills in Iraq, several cases of impulsive fires, contamination of surface waste, ground water pollution as well as increase in greenhouse gas emissions has been resulted [4]. Design, material handling, transportation and storage are amongst the main important stage in construction waste generation. These stages will require time as well as energy and would consequently affect the project performance and finishing time [4]. In Iraq, previous areas of construction waste management were researched, focusing on the techniques applied to manage and estimate the volume of waste being released [3]. This study however, aims in identifying the methods of reducing the generation of construction waste being generated from construction activities on site.



Selected Essay: Dr. Abdullah S.M.S. Mustafa

Air Dispersion Modeling for Pollutants Released from Stationary Phase

The U. S. Environmental Protection Agency (EPA), in conjunction with the American Meteorological Society (AMS), has developed a new air quality dispersion model, the AMS/EPA Regulatory Model (AERMOD). AERMOD is designed to calculate air pollutant concentrations in all types of terrain, from flat prairie to complex mountainous situations.

AERMOD does not process its own terrain. A preprocessor program, AERMAP, has been developed to process this terrain data in conjunction with a layout of receptors and sources to be used in AERMOD control files.

In 1991, the American Meteorological Society (AMS) and the U.S. Environmental Protection Agency (EPA) initiated a formal collaboration with the designed goal of introducing current planetary boundary layer (PBL) concepts into regulatory dispersion models. A working group (AMS/EPA Regulatory Model Improvement Committee, AERMIC) comprised of AMS and EPA scientists was formed for this collaborative effort.

In most air quality applications, one is concerned with dispersion in the PBL, the turbulent air layer next to the earth's surface that is controlled by the surface heating and friction and the overlying stratification. The PBL typically ranges from a few hundred meters in depth at night to 1 - 2 km during the day. Lead the reader into the topic and scope of your research.



Selected Essay: Dr. Nasir Chughtai

GIS : Glance at Reality

Humanity has reached another landmark when in November 2022, the population of the world has reached 8 billion. With finite natural and consumable resources of the earth and ever growing needs it is essential to focus on the management of these resources. There is a technology that provides a holistic approach for this mega-management. Geographical Information System (GIS) has this capability to encompass the entire planet. This system combines a mathematical model (coordinate system) for the shape of the earth, cartography (science of mapping) from geography, databases from information systems along with satellite images from earth observation satellites, survey data from ground truthing to provide estimations and analysis for any given area of interest.

With this overview the journey begins into what can be achieved through such a system. To start with this system segments the geography of any given area into Land Use and Land Cover. Where land use stands for how the land is being utilised (cities, household parcels, road network, industrial areas etc.) and land cover for what natural landforms are present over a given area (mountains, lakes, rivers, deserts etc.).

GIS records and integrates the data of all provided spatial entities through Cadastral Maps (Ownership Record), Land Information System, Services Networks, Demographic & Census Data, Agri-Systems, Geological Datasets, Land Cover Data ... for 2D, 3D and 4D virtual models of reality. Various analysis for planning, modelling, estimation, monitoring, reporting can be performed through GIS. These analyses provide crucial insights and projections for micro and macro management and governance.

GIS is methodical technology to have for coordination and integration of Government authorities and Governance structure. It provides the foundation for e-governance structure as it provides the top down approach as well as bottom up approach. From the safety of surveillance camera system, municipality functions, emergency facilities (police vehicle and ambulance tracking), early crop yield estimation, logistical networks, automated traffic management, cities and town planning, (power, fuel, gas, telecom)-networks planning and management to the modelling the impact of climate change, time based comparison of changes in geography, modelling of expansions in urban areas, disaster emergency modelling and preparedness, projection of numbers of schools and hospitals to build every year to the precision of best possible available location for such facility on the basis of ease of approach.

GIS holds a phenomenal number of advantages for planning, development and management. It sums up a wide area of reality onto a screen through a map, a chart or a graph and table which people from various discipline can view and understand easily. It is said 'a picture speaks a thousand words' but a GIS Map can translate the world to you.



Selected Essay: Dr. Doaa Madany

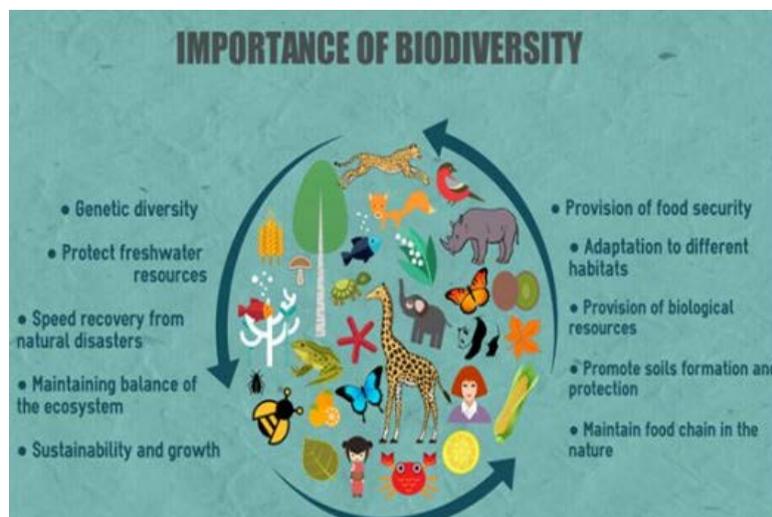
Biodiversity and Sustainability

Many people wonder: How does biodiversity related to sustainability?

The United Nations confirm that biodiversity is necessary for sustainable development as biodiversity plays a crucial role in the accomplishment of the 17 Sustainable Development Goals (SDGs). On one hand, biodiversity is essential for continued human life. On the other hand, sustainable development is needed to ensure that this life support system is maintained. Therefore one of the goals of sustainable development is to preserve, restore or enhance biodiversity, for the benefit of life on Earth. That mean “The biodiversity loss may have catastrophic consequences for humanity. For this reason, all hands need to be on deck. Everyone needs to do their part”.

The Convention on Biological Diversity (CBD) has defined biodiversity as "the variability among living organisms from all sources including diversity within species, between species and of ecosystems." the term attempts to reflect the variation of, and interaction among, all life on Earth.

Biologically diversity is essential to human health, well-being and prosperity. It supplies us with everything from the air that we breathe, to the water that we drink and the food that we eat, as well as clothing and shelter. More than 8 billion people inhabiting planet earth rely on nature and biodiversity for their livelihood and well-being, either through economic, cultural, or spiritual benefits. Nature also has intrinsic value — it has value in its own right too.



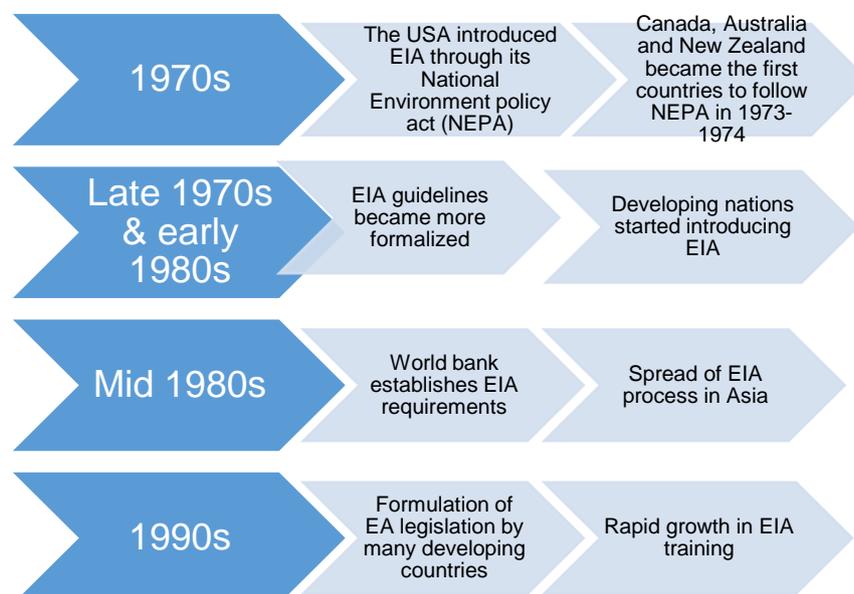


Selected Essay: Dipa Lalwani

Recent Trends in EIA Data Collection and Reporting

Background of EIA

Environmental Impact Assessment (EIA) can be defined as the study to measure the current or future possible impact of a proposed activity/project on the environment. EIA is a planning and decision-making tool first established in the United States in the National Environmental Policy Act of 1969 (1). It compares various alternatives for a project/development and seeks to identify the way which represents the best combination of economic and environmental costs and benefits. EIA is one of the successful policy innovations of the 20th Century for environmental conservation. The brief about history and evolution of EIA is depicted in Figure 1. EIA is now an integral part of the development process in both developed and developing countries . Recently, the UN Environment Programme (UNEP, or UN Environment) has released a report that provides an overview of national legislation and institutional arrangements relevant to environmental impact assessments (EIAs) and strategic environmental assessments (SEAs). The report, global in its focus, underscores the importance of such assessments in achieving the 2030 Agenda for Sustainable Development and the Strategic Plan for Biodiversity (2).





OROKOM Newsletter

January 2023



Selected Essay: Ralf Riedel

Orokom Monthly Newsletter Material from Ralf Riedel

This is an outline of potential services that I can render to Orokom in their quest to promote environmental conservation, management, and stewardship. My approach to offering assistance will be long term, starting with training and continuing into the future with added projects. Training will be in the areas of data management and analysis, as that is one of the most important in supporting projects on environmental conservation. Projects I am proposing as the next stage in my services, which will comprise mostly of resource use and management. My proposals for projects must now be seen as suggestions of what I feel is important for the Iraqi region. As I provide my suggested training, my vision for projects might change to align to emerging issues or issues that will be brought up during my interactions with students and Orokom personnel.

Below I will provide a brief introduction to the environmental situation in Iraq, proceeding with a discussion about my services in the area of training, providing details on what I see are important subjects. At this incipient stage, I will not provide a syllabus. Following, I will segue into a few projects that I deem of immediate need.

Introduction

Iraq faces similar environmental problems as do most developing countries, mostly stemming from issues related to population growth, poor land use planning, and climate change. Additionally, Iraq's life-sustaining natural resources suffer from the impacts of three major wars. In combination, poor water quality, increases in soil salinity, shortages in water supply, pollution, and deterioration of ecosystems, with losses of key habitats, from human encroachment are the main factors of Iraq's environmental crisis.



Selected Essay: Anu Asokan

The EIA Assesses the Direct and Indirect Significant Impact of a Project Based on a Wide Range of Environmental Factors, Including Population and Human Health.

biodiversity.

land.

soil.

water.

air.

climate.

landscape.

material assets.

cultural heritage.

The project developer must provide the approval authority with a report containing the following information

description of the project (location, design, size)

potential significant effects

reasonable alternatives

features of the project and/or measures to avoid, prevent, reduce or offset likely significant impacts on the environment ,There are also strict rules about how the public is informed of the project and the fact that it is subject to an EIA procedure and how those affected can participate in the decision-making process. The public is also .informed of the decision afterwards and can then challenge before the courts

The EIA procedure guarantees environmental protection

and transparency with regard to the decision-making process for several public and private projects. With its wide scope and broad purpose, the EIA ensures that environmental concerns are considered from the very beginning of new building or development projects, or their changes or extensions. It allows the public to actively .engage in the EIA procedure

EIA principles

Early

Transparent

Participatory

Independent

Rigorous

Objective

clear



Selected Essay: Hamidreza Abbasi

Environmental Impact Assessment of GAP Project on the Activity of Sand and Dust Sources using Remote Sensing and Field Survey in Iraq and Iran (Hour al-Azim wetland)

Wind erosion as one of the desertification process affects approximately 28% of the global land (Oldeman, 1992). It occurs as land degradation under all sort of climates but it common in dry-lands which has been accelerated by human activities. Dust storm is a natural phenomenon influenced by many natural factors, such as soil moisture, poor vegetation, erosive wind, size particles, surface roughness, and so forth. Therefore, spatiotemporal variations in dust events are inevitable and quite significant.

The Middle East is the regions with the highest dust frequencies, as observed from synoptic weather reports (shao et al 2013). This region is known to be prone to dust storms originating from both active external dust source regions (Iraq, Iran and Syria) and internal dust sources (Prospero et al., 2002; Abdi Vishkaee et al., 2011). There is certainly no clear trend in sand and dust storms frequency in this decade so that it has strongly increased in the inner Mongolia china (Shinoda et al., 2011), Xinjiang (Wei et al., 2005), Sistan Iran (Miri et al., 2010), Khuzestan Iran (Zarasvandi et al., 2011), northwestern Iraq (Yahya and Seker, 2019) and a significant decrease in central Asia (Indoitu et al., 2012).

The Southeastern Anatolia Project (GAP) is the largest scale and ambitious in the Republic of Turkey. it covers on average, 10.7% of country in the Euphrates-Tigris Basin and upper Mesopotamia plains in both geographical and population terms. The objectives of the GAP include improving the level of income and life quality of local population by utilizing region's resources. The GAP was considered as a programme geared to developing water and land resources of the region and it was planned to launch 22 dams, 19 hydraulic power plants and irrigation investments covering 1.8 million hectares of land in the Euphrates-Tigris Basin. The total installed capacity of hydraulic power plants would be 7476 MW with annual energy production of 27 billion kilowatt-hours. Atatürk Dam is one of the big dams in the project which is the third largest reservoir in Turkey, 817 square kilometers can hold a volume of 48.7 cubic kilometers of water (water technology 2023).



Selected Essay: Wael (Fathi) Galal

الاهوار والتغيرات المناخية

تشكل أهوار بلاد ما بين النهرين واحدة من أولى المناظر الطبيعية التاريخية حيث بدأ الناس قديما في تحويل البيئة الطبيعية وتطويعها من أجل الحفاظ عليها كمناطق للاستيطان. لآلاف السنين، حول الناس النظم البيئية الطبيعية إلى مجموعات سكنية في الحقول الزراعية وبيئات أخرى متكثرة للحفاظ على الاستقرار طويل الأجل علاوة على ذلك، شكلت أهوار بلاد ما بين النهرين الواقعة في واحدة من أكثر المناطق سخونة والأكثر جفافا نظاما بيئيا للأراضي الرطبة، والذي بصرف النظر عن ملايين الأشخاص، حافظ على عدد كبير جدا من الحياة البرية والأنواع المستوطنة العديد من التغيرات السياسية والاجتماعية والمناخية التاريخية التي حدثت بكثافة خلال القرن الماضي واثرت سلبا في المنطقة بالكامل مما جعل جميع النباتات والحيوانات البرية تختفي وأجبرت مئات الآلاف من السكان على الهجرة خلال العقد الماضي. تم إنشاء العديد من الحواجز لاستعادة الأهوار، ومع ذلك، تفتقر هذه الحواجز إلى التخطيط المركزي والأهداف المتناسكة والفهم العميق للوضع الحالي الكامل مما يجعل عملية إعادة تأهيلها يحتاج إلى توفير استراتيجيات لاستعادة أهوار بلاد ما بين النهرين وتنظيم الوظائف الإنتاجية من أجل الحفاظ على السكان المحليين وتصميم نماذج سكنية جديدة متقدمة مع مراعاة الظروف المناخية الحادة والعديد من الجوانب الثقافية الفريدة.

يهدف هذا المقال الى تقديم تعريف للأراضي الرطبة في العراق وكيف يمكن استخدامها كمنطقة لدمج العمليات البيئية مع النشاط البشري بطريقة أكثر استدامة. وعلى الصعيد الإقليمي، يهدف المقال الى القاء الضوء على محاولة فهم العلاقات بين المستوطنات البشرية القائمة والمواقع الإنتاجية المحيطة بها. وستودي عملية رسم الخرائط الإقليمية وفهمها إلى اقتراح نظام شامل للبنية التحتية المائية والممرات الإيكولوجية الطبيعية لغرض التكامل الإقليمي. ومحاولة طرح إعادة تنظيم المستوطنات القائمة، واقتراح سلسلة من الحلول التي من شأنها تسهيل الوظائف الإيكولوجية والاقتصادية والاجتماعية.

حيث ان الأهوار هي واحدة من أهم النظم الإيكولوجية للمياه العذبة في العالم وتقع في بيئة قاحلة للغاية تتميز بمعدلات عالية من التبخر والتنج، وبعض من أدنى مستويات هطول الأمطار. حيث يمكن اعتبارها جزيرة رطبة في محيط شاسع من الصحراء. تحتضن الأهوار عدد كبير من الأصناف الحيوي بما في ذلك الأنواع المهددة عالميا والمقيدة النطاق والمجموعات المعزولة، مما يخلق موقعا من العيار العالمي من حيث الأنواع ذات الأولوية في الحفظ. تعد الأهوار مثلا استثنائيا على العمليات البيئية والبيولوجية المستمرة في تطوير وتكييف النظم الإيكولوجية الأرضية والمياه العذبة والمالحة ومجموعات الأصناف المختلفة ذات الطبيعة المستوطنة والمقيدة. حيث تعد الأهوار موطنًا شاسعا وملجأ للعديد من المجموعات القابلة للحياة من الأصناف ذات التنوع البيولوجي، وخاصة أنواع الطيور والأسماك. علاوة على ذلك فهي تشكل منطقة التوقف الأخيرة لملايين الطيور المهاجرة قبل دخول الصحراء العربية الشاسعة.

هذا ويعد النظام الهيدرولوجي للأهوار نظاما فريدا من نوعه وهو في حد ذاته ظاهرة طبيعية بارزة، تمثل أرضا رطبة قابلة للتغير في الحجم موسميا. لا سيما بعد الجفاف والتدهور البيئي الشديد خلال النصف الثاني من القرن الماضي وإعادة عمرها مرة أخرى لتصبحها بيئيا في بداية الألفية الجديدة.

لا تزال الأراضي الرطبة في بلاد ما بين النهرين منطقة ذات أهمية كبيرة لدراسة وفهم نماذج الاستيطان البشري عبر التاريخ وتطور المدينة من بلدة صغيرة. التي تم فيها دمج العلاقة بين البيئات البشرية والطبيعية بشكل أكثر إنتاجية حتى تم تقدير عدد السكان الذين تراوحو بين الأشخاص الذين أطلقوا على أنفسهم اسم عرب الأهوار الذين عاشوا في المناطق المحيطة بالأراضي الرطبة في بلاد ما بين النهرين معظمهم من المزارعين الذين تعتمد حياتهم على الموارد الطبيعية للأهوار لإنتاج الأرز تربية الماشية والأسماك ويعيشون في علاقة مرتبطة بشكل معقد بالأراضي الرطبة مما يطمس الخط الفاصل بين البيئات التي من صنع الإنسان والبيئات الطبيعية.

هناك مزايا مناخية كبيرة تعزز الظروف المثالية للحياة فيها خاصة في المناطق ذات درجات الحرارة المرتفعة في الصيف يمكن أن يكون للأراضي الرطبة اختيار إيجابي على مناخ المنطقة من خلال توفير التبريد الطبيعي تعتبر الأراضي الرطبة خاصة في مناخها المحلي لأنها تعرض الخصائص المناخية لكل من الأنظمة الأرضية والمائية من التبخر السطحي ونتج النبات يمكن أن يكون لدرجة رطوبة الأراضي الرطبة تأثيرات كبيرة على مناخ المنطقة، حيث أن وجود المياه والنباتات يجعل الأراضي الرطبة تعمل كجهاز تبريد للمنطقة المغطاة.



Selected Proposal :Tara Rasoul

Using Diffusion Tubes to Measure NO₂ levels in Urban Areas of Iraq

Nitrogen dioxide (NO₂) is one of the key pollutants in the ambient atmosphere that have adverse effects on human health and the environment. It contributes to the acidification of the environment and the formation of tropospheric ozone (O₃). This study employs passive diffusion tube samplers to assess spatial and temporal patterns of NO₂ concentrations in ambient air of urban areas within Iraq.

Problem Statement

Air pollution on a local, regional, or global scale results from direct emissions of pollutants from natural and anthropogenic sources (industrial, road transport, residential and commercial) into the atmosphere. Pollutants that are not emitted, such as O₃ are formed from chemical reactions involving primary emitted pollutants. Upon emission, the pollutants subject to dispersion, transport, chemical reactions, and removal from the atmosphere. All these processes affect the concentrations of pollutants. Some pollutants such as NO₂ and particulate matter (PM) can be found in high concentrations at roadside locations in urban areas, and due to their direct effects on public health, legislation to limit their abundance has been established. The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organization (WHO) with regards to current scientific knowledge and the effects of each pollutant on health and the environment. In Europe, the Air Quality Directive and 4th Daughter Directive set limit values for PM₁₀, PM_{2.5}, NO₂, and O₃ that should not be exceeded as shown in Table 1. Recently WHO Global Air Quality Guidelines (AQGs) reduced the limit value of six key air pollutants as shown in Table 1.



OROKOM Newsletter

January 2023



Selected Proposal: Dr.Tresa Radhakrishnan Ph.D

I am sending three project proposals for your kind perusal and necessary favorable action at the earliest. The proposals come under the three thrust areas such as

1. Environmental Impact Assessment (EIA)
2. Biodiversity Conservation and Protected Area Management
3. Capacity Building both Academic and Technical

Please accept the same to seek funding through the Iraq Government, UN Agencies, International Oil Companies, Donors and others will be routed through your esteemed Organization OROKOM

Thanking You

Dr.Tresa Radhakrishnan Ph.D



Selected Proposal: Dritan Dhora

MANAGEMENT PLAN FOR HABBANIYA LAKE (ANBAR, IRAQ)

Background and Context

Habbaniya Lake is situated in South-East of Ramad, capital city of Anbar Governorate, West of Bagdat, Iraq. As a water ecosystem, Habbaniya Lake is a natural resource with considerable values, very important for the community that live around it. It is an important habitat especially for water birds and for this reason it is included as Important Bird Area (IBA016) ([http 1](#)). It has a big potential for economic development of the community in this area, but for that it is needed first of all to be ecologically improved and then to be used rationally to ensure income for community. The study area has adequate conditions of climate and soil; therefore the agricultural lands and touristic areas can be developing especially the adjacent areas of Al-Habbaniya Lake (Mousa, A. & Al-Khafaji, A., 2013). The main habitat is the lake itself and its wide, muddy shoreline. The vegetation in the lake is composed by species of *Phragmites* sp, *Typha* sp, *Achillea* sp, *Artemisia* sp, *Acacia* sp. and *Alhagi* sp, which are the most widely distributed plants. There is a small elevation gain near the southern edge of the lake, and semi-desert forms the eastern and southwestern front of the lake with xeric and halophytic desert vegetation. The shore is widely exposed during the wintertime when the water levels are reduced to their minimum level. A few wetlands with submerged aquatic vegetation were observed near Al Majarah water regulation canal, including a limited number of reed beds. The village of Al-Angoor is located on the southwestern edge of Habbaniya and contains a few people who mainly practice fishing. The Habbaniyah tourism village is one of the most significant landmarks, located on the southeast edge of the lake. The habitat around this area features some dense shrubs and thickets. The key biodiversity area criteria is the presence of the Globally Endangered *euphraticus*, listed as endangered under criteria A4c of IUCN Red List.



Selected Proposal : Dr. Ali Shayyish

Scalability of Groundwater Recharge and Implications on Watershed Management: A Case Study from the Al-Anbar Province, Iraq

Iraq, in the last few decades, has experienced a sharp decline in the surface water of the Tigris and the Euphrates Rivers, which are the main sources of water in Iraq (Figure 1). The management of these rivers and their watersheds has been impacted by a complex series of dams on their tributaries in Turkey, Syria, and Iran. Many development projects in Turkey, Syria, and Iran include 32 major dams on the Tigris, Euphrates, Karkheh, and Karun Rivers. Eight more dams are currently under construction, and thirteen more are planned (UNEP 2001). A consequence of this proliferation in dams has been severe water shortage for the downstream countries; Iraq particularly is affected by upstream management that includes large volumes of water extracted for irrigation projects and generate of electricity (UNEP 2001). Turkey, Syria, and Iran are the main upstream countries, where the waters of the Tigris and the Euphrates Rivers come from. These countries have built many huge dams and water control conversions in the watershed of the Tigris and the Euphrates Rivers to meet the increasing demand for water in different sectors, such as agriculture, power generation, and human consumption. Consequently, in the last 40 years, the water management in upstream countries has made Iraq records a drop in the annual flow rate of about 45% and 50% of the Tigris and the Euphrates Rivers, respectively.



Selected Proposal: Muatz Al-Dabas

CULTIVATION OF JATROVA TO STABILIZ SAND DUNES AND COMBATING SAND DUST STORMS, ANBAR GOVERNORATE, IRAQ

The sand dunes in Anbar Governorate covered large area in the main time, and increased each year because the drought and decreasing of annual rainfall as a result of climate change. The suggested project area is covered by different types of sand dunes such as; Barchan, Transverse, sand sheets.

About 95% of the sand dunes are of fine sand size, and mostly of well sorted to moderately sorted in wind side and in sheet sand samples which moderated sorted in lee side of the dunes.

During the last years many problems were developed by increasing creep of sand dunes to the industrial and establishments, roads, pipelines and railway as well as decreasing in the size of agricultural area, in addition to increase the sand and dust storms.

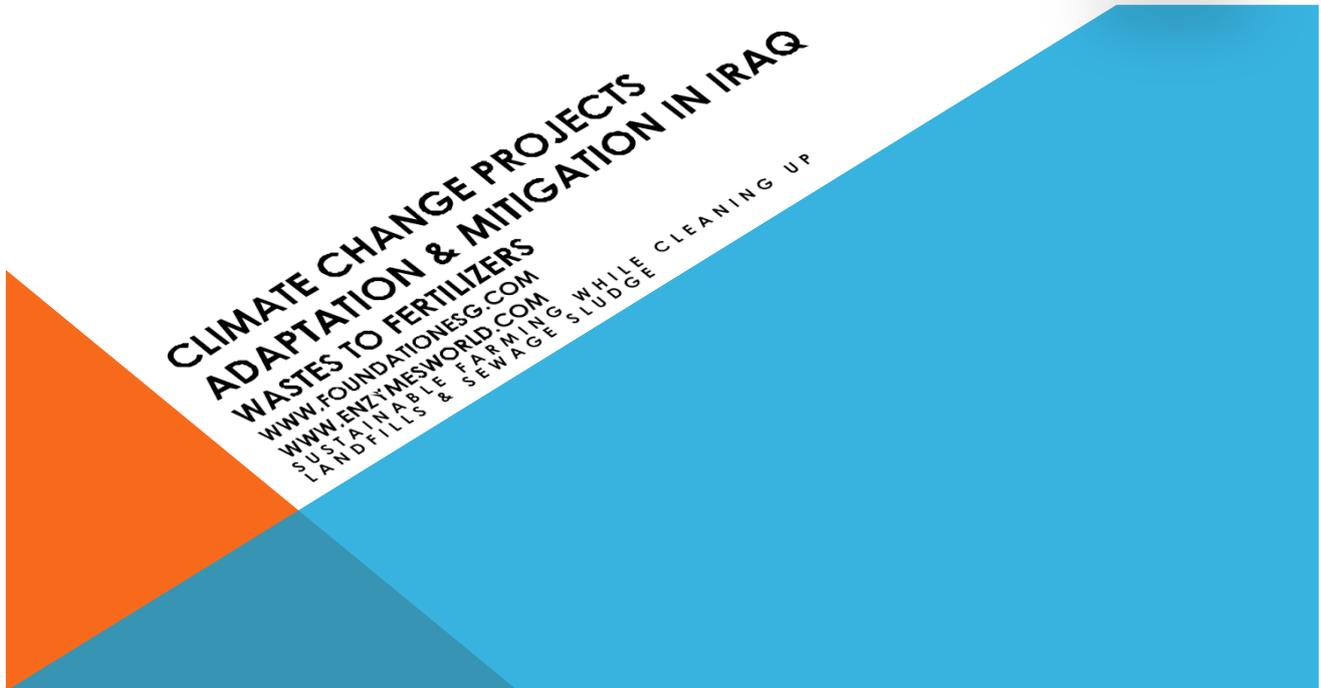
The tree *Jatropha curcas L.*, originated in Central America and today founded in most tropical countries. It is draught resistant, and because of that it is considered as suitable plant for stabilizing sand dunes.

The planting of *Jatropha* have been succeeded in many countries to decrease desertification and stabilize sand dunes and sandy soil, in addition to economic importance of this plant.

The suggested green belt of *Jatropha* around selected sites western Razaza Lake, covered about 200 hectares, and the estimated total cost of the project about 1440000\$ for 8 farms (total area =200 hectares).



Selected presentation : Feliks V. Lacroi



THE SITUATION

A country like Iraq considering it owns vast natural resources of oil & gas will be the focus of pressures to reduce its overall gas emissions while still exploiting those assets at the heart of its economy.

Iraq needs to figure out ways to economically grow while reducing its carbon footprint and fight Climate Change. Projects with direct and measurable results need to be implemented. Iraq needs to establish projects to adapt & mitigate in the short term!

The Enzymes Technology represents an immediate applicable solution towards this goal by reducing directly gas emissions (methane) from landfills & sewage facilities while creating sustainable farming.

Increasing its agricultural output for example while doing it in a sustainable way is one of those ways reachable within months.

Attracting diversified foreign investments in the future might very well depend on it.

The Enzymes Technology converts Organic waste into fertilizers in record time of 14 days. It is a Patent pending Technology re-inventing regular composting without having to build costly plants. It is an affordable & easily implementable way to jump start sustainable farming!



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Selected presentation: Dr. Cemal KALDIRIMCI

METAN Presents



**ENVIRONMENTAL FRIENDLY AND ECONOMICAL
HEALTHCARE WASTE MANAGEMENT PROJECT**

**What is the reason of implementing a
proper
Healthcare Waste Management**

**To protect the PUBLIC and the
ENVIRONMENT from exposure to
DISEASE CAUSING AGENTS or
HARM CAUSED by
HAZARDOUS HEALTHCARE WASTES**



Selected presentation : res.ahmed abdelwahed alkotae

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The perfect planning of a green farms via modern Ecoengineering solutions ensures the best results of sustainability not only ensures Energy Supplies but all Human needs for living Food Water & Oxygen

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Aerial drones survey the fields, mapping weeds, yield and soil variation. This enables precise application of inputs, mapping spread of pernicious weed blackgrass could increase wheat yields by 2-5%.

FLEET OF AGRIBOTS
A herd of specialised agribots tend to crops, weeding, fertilising and harvesting. Robots capable of microdot application of fertiliser reduce fertiliser cost by 99.9%.

FARMING DATA
The farm generates vast quantities of rich and varied data. This is stored in the cloud. Data can be used as digital evidence or reducing time spent completing grant applications or carrying out farm inspections, saving on average £5,500 per farm per year.

TEXTING COWS
Sensors attached to livestock allowing monitoring of animal health and wellbeing. They can send texts to alert farmers when a cow goes into labour or develops infection increasing herd survival and increasing milk yields by 10%.

SMART TRACTORS
GPS controlled steering and optimised route planning reduces soil erosion, saving fuel costs by 10%.

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Thank you.