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Jaffna Science Association, Jaffna, Sri Lanka

MESSAGE FROM THE GENERAL SECRETARY

I would like to express my sincere gratitude to the members of the Jaffna Science Association for the confidence and trust placed in me and electing me as the General Secretary and I am very much delighted in sending this message to this year's second Newsletter of the Jaffna Science Association (JSA). Unfortunately the destructive power of science has been exploited by human beings in a number of occasions which has left an incredible mark in the 20th century. To erase this mark science is making constructive efforts. Education empowers the society to grow in real sense by overcoming poverty, ignorance and lack of esteem. The JSA was started in 1991 under the leadership of Prof.A.Thuraiajah (was the then Vice Chancellor of the University of Jaffna). The main aim of JSA founders was the dissemination of latest scientific knowledge not only among the scientific community, but also among the public to show them how understanding science can help to enrich their day to day life.

The twenty second executive committee has conducted as usual, school science programme in schools in the Northern Province. The events included quiz, essay writing, oratory, exhibition, school gardening, drawing, poster and documentary films contest. In addition, a number of public seminars were organized not only when there was a resource person but also to mark annually celebrated days like 'World Environment Day' and 'World No Tobacco Day'.

Section A of the JSA continues to publish articles in the *Valampuri* Newspaper, which are on current topics of interest. In addition, considerable new additions were made for the benefit of its members such as establishing an official website for the JSA to make it easy to disseminate the knowledge to the public and initiated a publication division to facilitate both academic advancement and a platform for its members to publish their work as peer-reviewed books.

With the dawn of water problem in certain areas of Jaffna peninsula, it is interesting to note that our theme has given utmost importance to the most essential natural resource in the world as a whole. Thus, we proposed "*Sustainable natural water resource development and management*" to be our theme this year. This theme had the potential to draw expertise from various disciplines. The twenty second annual session of the JSA will be held from 5th to 7th May 2015 with Prof.Nilanthi de Silva as Chief Guest. Almost all the talks in this annual session will focus on issues related to water. So I urge the members to actively engage in the Popular lectures, Chairpersons' addresses and Theme seminar in addition to the *Prof.Kandiah Balasubramaniam Gold Medal Lecture* to enrich your knowledge. The views of the scientists are of extreme importance to face the current water issue in the Jaffna peninsula.

Last but not least, I would like to congratulate and thank each and every member of JSA with special thanks to executive committee members for their kind cooperation in achieving the goals of this present executive committee. We hope the new executive committee will enrich the JSA website by adding more information and make it more user friendly as it has become the necessity of the fast moving world. Finally, we humbly request all the members of JSA to be collaborative and cooperative to reach the short-term and long-term goals of the JSA in the years to come to achieve sustainable development in the country.

Dr.P.Sevvel
General Secretary/JSA

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Please send your feedback and comments to Dr(Mrs).K.Chandrasekar (e-mail: kchandrasekar68@gmail.com), Chief Editor/ JSA.

Money Laundering

Money laundering is considered as an offence by all civilized nations. It is one of the biggest threats to society. The United Nations have recognized that a great amount of wealth is generated through organized crime. Criminal activities, such as drug trafficking, smuggling, human trafficking, corruption and others, tend to generate large amount of profits for the individuals or groups carrying out the criminal act. However, by using funds from such illicit sources, criminals risk drawing the authorities' attention to the underlying criminal activity and exposing themselves to criminal prosecution. In order to benefit freely from the proceeds of their crime, they must therefore conceal the illicit origin of these funds. This process has known as **money laundering**.

The International Monetary Fund (IMF) defines "**money laundering**" as the process by which proceeds from a criminal activity are disguised to conceal their illicit origin. The criminals try to launder the money because of various reasons. They are:

- **Hiding wealth:** Criminals can hide illegally accumulated wealth to avoid its seizure by authorities.
- **Avoiding prosecution:** Criminals can avoid prosecution by distancing themselves from the illegal funds.
- **Evading taxes:** Criminals can evade taxes that would be imposed on earnings from the funds.
- **Increasing profits:** Criminals can increase profits by reinvesting the illegal funds in business.
- **Becoming legitimate:** Criminals can use the laundered funds to build up a business and provide legitimacy to this business.

Stages of Money Laundering

Money laundering is not a single act; in fact money laundering cycle can be broken down into three distinct steps. They are:

- **Placement:** At this stage, illegal funds or assets are first brought into the financial system. This '**placement**' makes the funds more liquid. For example, if cash is converted into a bank deposit, it becomes easier to transfer and manipulate.
- **Layering:** To conceal the illegal origin of the placed funds and thereby make them more useful, the funds must be moved, dispersed and disguised. The process of distancing the placed funds from their illegal origins is known as '**layering**'. At this stage, money launderers use many different techniques to layer the funds.
- **Integration:** Once the funds are layered and distanced from their origins, they are made available to criminals to use and control as apparently legitimate funds. This final stage in the money laundering process is called '**integration**'. At this stage, the illegal money has achieved the appearance of legitimacy.

However, it would be misguided to visualize the *money Laundering process* as a simple three stage process. Depending on the circumstances, these stages could occur simultaneously or even overlap.

Economic and Social Consequences

There are several economic and social consequences of money laundering. These include:

- **Undermining financial systems:** Money laundering expands the black economy, undermines the financial system and raises questions of credibility and transparency
- **Expanding crime:** Money laundering encourages crime because it enables criminals to effectively use and deploy their illegal funds
- **'Criminalizing' society:** Criminals can increase profits by reinvesting the illegal funds in businesses

- **Reducing revenue and control:** Money laundering diminishes government tax revenue and weakens government control over the economy
- **Threatening territorial integrity and sovereignty of independent countries:** Implication of money laundering & terrorist financing are not isolated issues and also not unique to a particular jurisdiction
- **Facilitating corruption and crime at the expense of economic development:** Money laundering encourages & promotes level and frequency of crime.

Anti Money Laundering in Sri Lanka

Sri Lanka is currently working to strengthen its Anti Money Laundering (AML) and terrorist financing regulations. However, the country still faces numerous money laundering threats, emanating from various illegal activities.

Sri Lanka has passed numerous laws dealing with combating money laundering. However, gaps still exist in Sri Lanka's AML efforts. Most notably, there are currently no regulations to monitor the activities of charities and non-profit organizations, some of which are used as fronts for money laundering and terrorist financing. Nevertheless, Sri Lanka has made great strides in regulating and combating money laundering in the recent past, and continues to focus on creating stricter and more effective rules and regulations.

Overall, money laundering presents the world community with a complex and dynamic challenge. Indeed, the global nature of money laundering requires global standards and International Corporation for reducing the ability of criminals to launder their proceeds and carry out their criminal activities.

Accordingly, every country should establish effective Anti Money Laundering policies, on the other hand, reinforce a variety of other good-governance policies that help sustain

economic development, particularly through the strengthening of the financial sector.

Mrs. Saseela Balagobei
Chairperson
Social Sciences (Section D) / JSA

OBITUARY

Mrs. Mangayatkarsi Rajaram, Former Assistant Director for Science (Thenmaradchchi zone) and Former Coordinator of Field Work Centre passed away on 5th August 2014. Mrs. M. Rajaram started her career as a Science teacher in 1972 and later become a famous Chemistry Teacher. She served at several schools in the Northern Province before promoted as an Assistant Director for Science (Thenmaradchchi zone), in 1999. She holds that position until her retirement. Even after retirement, she actively engaged in teaching (Visiting Lecturer for NIE, JNCoE, etc.) and social activities. As a Coordinator of Field Work Centre, she steered the FWC towards fulfilling its mission. She also served as an external member of the Faculty Board of Science, UJ.

She was an active member of the JSA and served as a member of the Executive committee of the Section B (JSA) for many years. This tribute is made with gratitude for the various contributions and support given by her to the JSA.

Oil Degradating Bacteria

Oil released into the environment is a well known problem in today's world. Oil spills affect many plants, animals as well as human in various ways. The search for effective and efficient methods of oil removal from contaminated sites has intensified in recent years. The most reliable and environmental friendly method is the biological degradation of oil by bacteria. Bacteria metabolize oil is more or less same as the human converts food in to energy.

A wide variety of bacteria, several molds and yeasts, certain cyanobacteria and some green algae have been known to be able to oxidize hydrocarbons. However, bacteria are the most important hydrocarbon degraders in aquatic and terrestrial ecosystems. These bacteria develop quickly on oil films and slicks. The significant aliphatic hydrocarbon oxidation occurs only in the presence of oxygen. If oil gets into anoxic sediments, it will be decomposed very slowly and may remain for many years. Even in aerobic environment, other environmental factors influence the activity of bacteria.

Oil is insoluble in water and is less dense. It floats to the surface and forms slicks. Hydrocarbon oxidizing bacteria are able to attach to insoluble oil droplets, carryout decomposition, and disperse the slicks. Pseudomonads, Corynebacteria and Mycobacteria are the important groups to degrade petroleum products and release CO₂. Volatile hydrocarbon fractions evaporate quickly, leaving longer chain aliphatic and aromatic components for clean up by bacteria and other microbes.

Experiments have shown that under ideal conditions up to 80% of the non-volatile components are oxidized by bacteria within six months. Certain fractions such as, branched chains and polycyclic hydrocarbons remain in the environment much longer. Evolution has created some obligate hydrocarbon degraders such as, *Oleispira*, *Oleiphilus*, *Alcanivorax* and *Cycloclasticus*. Current interest in the metabolism of these bacteria has spurred on various genome

sequencing projects. The genome of the *Alcanivorax borkumensis* has been studied in detail. The features of its genome revealed how this bacterium grows efficiently on alkanes. This bacterium encodes extensive exo-polysaccharide production and pili through which it can attach to the oil water interface. Biosurfactants can also be produced by this bacterium and increase the oil water interface area. So Bacteria play an important role in the cleanup of oil spills.

Mr.A.C.Thavaranjit
Chairperson
Pure Sciences (Section A) / JSA

Membership Profile Update 2014/2015

Name of the member	Type	Section
Dr(Miss) V.Cynthujah	Life	B
Dr.M.Balasubramaniam	Life	C
Miss.K.Jeyasothy	Ordinary	D
Miss.P.Sivasinthujah	Life	C
Miss.Rohini Ramachandran	Life	B
Miss.Saranja Chandrawijeyakumar	Life	B
Miss.T.Abiramy	Life	B
Miss.Tharaga Kanenthiran	Life	B
Miss.V.Sowthini	Life	B
Mr.A.Kajavatan	Life	B
Mr.D.Saliya sampath	Life	B
Mr.K.Kamalaruban	Life	B
Mr.K.M.D.Senathera Degamadulla	Life	A
Mr.S.Surendran	Life	B
Mr.Y.Bavaneethan	Ordinary	B
Mrs.J.L.Anne Starina	Ordinary	B
Mrs.Mythini Jeyasudhan	Ordinary	B

JSA Sectional Activities 2014/2015

Section A

- 05.06.2014 - "World Environment Day" celebrations organized at Jaffna Hindu College.
- Published scientific articles in the *Valampuri* local daily newspaper, on weekly basis.

Section B

- 11.08.2014 - Research presentation on "Hypotheses of Cultivating Fresh Water in the Jaffna Lagoons: Is it a Challenge for Engineers and Environmentalists?" by Dr(Eng).S. S.Sivakumar and Eng.S.Kuganesan, jointly organized by Department of Civil Engineering (UJ), Institute of Engineers (Northern Provincial Centre), Jaffna Managers Forum and Section B (JSA).
- 03.11.2014 - Popular talk on "Water for all by 2015 - 2030 as one of the Sustainable Development Goals (SDG) of United Nations - Need for National Strategy for Capacity Building in Water Sector of Sri Lanka" by Nimal Gunawardena (Senior Professor, Department of Agricultural Engineering, University of Peradeniya).
- Published "Pirayoga Vignana Sudar (vol.8, issue 1)", an informative magazine contains articles on applied sciences.

Professor K. Balasubramaniam Gold Medal Lecture - 2015

The winner of this award for this year is **Professor Nilanthi de Silva** (Dean, Faculty of Medicine, University of Kelaniya; Senior Professor, Department of Parasitology, Faculty of Medicine, University of Kelaniya; Member of the Royal College of Obstetricians and Gynaecologists), who will deliver the gold medal lecture entitled "*Intestinal Worms and the Human Condition: A Sri Lankan Perspective*" at the Natural Science Block, Faculty of Science, University of Jaffna, on May 05, 2015 @ 9.15 am.

Editorial Board of the Publication Division (JSA)

Chairman : Prof.K.Kandasamy
Members : Prof(Ms).V.Arasaratnam
Prof.S.Krishnarajah
Prof.G.Mihunthan
Prof.T.Velnampy
Prof.J.P.Jeyadevan
Dr.E.Y.A.Charles
Dr.S.Arivalzahan

JSA Sectional Activities 2014/2015

Section C

- 31.05.2014 - Procession march for **"World No Tobacco Day"** was organized jointly by Section C (JSA) and Department of Community & Family Medicine, Faculty of Medicine, UJ.
- 10.07.2014 - Popular talk on **"Improved TB Control by Boosting BCG Immunity"** delivered by Dr.Karuna P.Karunakaran (Senior Scientist, British Columbia Centre for Disease Control, Provincial Health Service Authority, Vancouver, Canada).
- 07.08.2014 - Lecture demonstration on **"Mendeley: Free Reference Management Software"** by Prof.A.Pathmeswaran (Professor in Public Health, Department of Public Health, University of Kelaniya).
- 13.02.2015 - Popular talk on **"Systematic Literature Review"** delivered by Associate Professor Dr.Arthorn Riewpaiboon (Department of Pharmacy, Mahidol University, Thailand).

- 06.04.2015 - Popular talk on **"Neutrophil Extracellular Traps: NETs in infectious, inflammatory and autoimmune diseases"** delivered by Prof.Nades Palaniyar (Senior Scientist, Lung Innate Immunity Research Program in Physiology and Experimental Medicine, Ontario, Canada).

Section D

- 26.06.2014 - Popular talk on **"Future of Tamils: A Demographic Perspective"** delivered by Dr.Murali Valipuranathan (Consultant Community Physician, Sri Lanka).
- 23.07.2014 & 24.07.2014 - Workshop on **"Factor Analysis: Its Nature, Mechanism and Uses in Research"** conducted by Dr.B.Nimalathasan (Senior Lecturer, Department of Accounting, UJ)

Theme of the Year – Sustainable Natural Water Resource Development and Management

Sections

- Section A: Pure Science –
- Section B: Applied Science –
- Section C: Medical Science –
- Section D: Social Science –

Sub Themes

- Quality Maintenance of Natural Water
- Technology for Safe Water
- Surviving with Typhoid: Challenges in the context of Jaffna Peninsula
- Preserving and Managing Natural Water

Resource-Based Learning: A Way towards Student-Centered Learning

Resource-based learning (RBL) is not a new concept in education. Moreover, it is not linked to a single learning theory or any specific pedagogy. Traditionally, RBL has been used to supplement instruction-based teaching methods. However, the volume of information available and the ability to transmit that information in multiple formats has refocused attention on the potential of RBL to support emerging inquiry-based models.

What is RBL?

Resource-based learning is an educational model designed to actively engage students with multiple resources, in print and non-print forms. Thus, learners take responsibility for selecting resources (human or otherwise) that appeal to their own learning preferences, interests and abilities. Further, resources incorporated into planned, authentic tasks, provide opportunities for students to develop the skills and techniques necessary to become autonomous, self-directed learners and effective users of information.

Teachers often teach lessons using a variety of media, including guest speakers, videos, or hypermedia presentations. In this regard, teachers' select content and mode of delivery, such instruction is more aptly deemed resource-based instruction, a pedagogy that is more teacher-centered. RBL is based on the principle that individual learners will be drawn to the media and content which best match their own processing skills and learning styles. Moreover, in RBL, learning focus also shifts from teachers using resources to facilitate instruction to students directing the choice of resources. In a continuum between teacher-centered and student-centered learning, resource-based learning occurs somewhere in the middle. When the constructivist educator uses RBL, instruction is teacher-planned, but student-directed.

Benefits of RBL

- Good lesson plans based on RBL are more engaging and motivating, which help the students to become better learners
- RBL provides training for the development of necessary information literacy skills, which enable students to independently meet their information needs during an activity, and promote the life-long learning
- Students learn to use a variety of information resources efficiently
- Students are motivated, because final products are readily displayed or presented
- Students feel empowered by the freedom to explore various resources and often perceive that they have uncovered knowledge unknown even to their teachers
- It significantly changes teacher practices, and challenging them to reinvent old instructional practices and routines

In a RBL school, students become more self-sufficient. They develop skills related to synthesize, analyze, interpret and evaluate information. Furthermore, libraries and databases, which have enormous amount of information from a variety of sources, can also be easily accessed all over the world, nowadays.

The potential challenges to implement RBL activities are inadequate cooperative and collaborative planning, lack of evaluation methods to assess the student attainment in learning goals and objectives, and student plagiarism. Above all, the support of school administration is paramount for RBL to work effectively.

*Dr(Mrs.)K.Chandrasekar
Chief Editor/JSA*

Source: Campbell, L., Flageolle, P., Griffith, S., & Wojcik, C. (2002). Resource-based learning. In: M. Orey (ed.), Emerging perspectives on learning, teaching, and technology. Indiana: Association for Educational Communications & Technology.

Jaffna Science Association Sectional Committees

Section A – Pure Sciences

Chairperson	: Mr.A.C.Thavaranjit
Secretary	: Dr(Mrs).G.Rajkumar
Editor	: Mr.K.Kajapathy
Committee members	: Mr.S.Selvarajan Mrs.A.Tharmini Mrs.S.Sudharshini Dr.T.Manorajan Mr.K.Kugan

Section B – Applied Sciences

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Section C – Medical Sciences

Chairperson	: Mrs.D.Thabotharan
Secretary	: Ms.V.Viniththira
Editor	: Mrs.L.Kamalarupan
Committee members	: Mr.S.Sathees Dr.P.A.D.Coonghe Dr.R.Surenthirakumaran Dr.S.Sivaganes Mrs.T.Gnanakarunyan

Section D – Social Sciences

Chairperson	: Mrs. S. Balagobei
Secretary	: Mr N.Sivakaran
Editor	: Mr E.Cumaran
Committee members	: Prof R.Sivachandran Mrs J.Thevananth Dr B. Nimalathasan Mr V.Kumaradeepan Mr S.Ragulendran

Jaffna Science Association 22nd Executive Committee

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Section B : Dr(Eng.).S.S.Sivakumar

Section C : Mrs.D.Thabotharan

Section D : Mrs.S.Balagobei

JSA MEMBERSHIP

Life membership	Rs.2000.00
Ordinary membership	Rs. 500.00
Student membership	Rs. 100.00

Application forms are available with the General Secretary and the Treasurer of the JSA.