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# VIDURAVA

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# Minimalism

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# VIDURAVA

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# Editorial

The articles in this edition of *Vidurava* touch on important, but heterogenous issues. Nevertheless, the concept of minimalism takes the Centre stage. The views and concepts concerning minimalism are appropriate, especially in the context of the unavoidable and steep increase in cost of living affecting both developed and developing countries. Hence the thought provoking issues on minimalism presented in the current articles deserve priority consideration. Although promoting the idea of living within one's available means and resources is clear and understandable, adherence to this principle is a rare phenomenon.

The articles on Neem Priming, and the use of Eppawela Rock Phosphate as a substitute for Triple Super Phosphate provide very useful information for the promotion of agriculture. Eppawela Rock Phosphate, being a mineral deposit, whether in a soluble form or insoluble form does not represent "Organic Farming". Neem as a naturally occurring plant based pesticide, had been used very effectively from ancient times In fact during the period 2003 – 2005 G. K. Upawansa (formerly of the Department of Agriculture), and J. M. R. S. Bandara (formally of the Faculty of Agriculture, University of Peradeniya), developed a holistic organic rice cultivation system called *Nawa Kekulama* in which not only the extract of neem seeds, but also a paste prepared from the leaves of the neem tree and that of a plant called "*Mahapatta*" were used. Sometime in the year 2004, the present writer was very fortunate to witness on invitation, the outcome of this demonstration trial carried out in 100 remote villages in Villachchi and Galnewa in the North Central Province.

**M. Asoka T. De Silva**

# Minimalism, is it only about living with less?

Prof. Chandanie G Hewage


The term minimalism implies living with minimum, less or fewer belongings. One who embraces minimalistic life style owns, uses and is happy with fewer material comparatively to a person who embraces ordinary/ common / traditional living. One may think and feel unhappy about such a living situation, given the commonly practiced consumerism today in the world of abundance and rapid change. Hence it may not be appealing to somebody who wishes to live a life of variety, flexibility, creativity, richness and sophistication.

Does minimalism means living a limited, constricted and boring life using few possessions all your life? NO... it is not.

Superficially taken, people who practice minimalistic living own and use less. There are many advantages closely linked to having less. These are reflected in many facets of life including money and finances, time, freedom, and quality of life to name a few.

In this article I am going to briefly tell some of the clearly visible advantages of minimalistic living.

**Advantage 1: Your money and finances**

Living a life possessing less belongings gives you a significant relief and advantage to your financial status.

The fewer stuff you purchase means less spending and you will have unspent money in hand. You will feel

financially strong and empowered when you have surplus of money.

Most of the time people have a set budget for purchases. One has to balance this set amount of money to cover all his planned and unplanned purchases. If a given amount of money has to be spent on ten items, the amount you can spend for one item is lower, as you have to divide that fixed amount of money for ten purchases. But as a minimalist if you are going to purchase only one or two items, the fixed amount of money can be used just for one purchase or two, means you have more money to spend for each item you are going to purchase. When you have more money to spend, you get freedom to look for better quality regardless of the cost.

When your belongings are of higher quality, they serve the purpose better, maintenance is easy, less repairs and last longer. Expensive but high-quality products usually have longer warranty

periods. Hence repairs are less costly and maintenance services are cheaper and better. Replacement needs of quality products are less frequent, you get a better value for the money you spent. Again, you save money leaving surplus in your hand.

Maintaining, repairing and replacing fewer number of belongings is cheaper than doing so for many belongings. Again, less spending and more surplus of money.

Too many things cannot be kept visible in your living environment. Result? You forget you have them, and spend money to purchase again, to find later that you already have them hidden in some storage space away from your eyes. Having a lot, not visible, make you to spend unnecessarily, may be duplicate purchasing, hence burden your finances.

When you have surplus of money, you may invest it for further strengthening of your financial status. You will note that this spirals up leading for higher financial security and freedom.

**Advantage 2: Time**

Value of the time is immeasurable. However rich you are, you will not be able to buy time. Everybody have

same fixed amount of time and use of this finite time for things which are meaningful for you to make you happy.

How minimalism comes you advantages over time? I try to help you to understand it giving some examples.

Look at a time period, a week- and pay attention to how your 24hr x 7 was used up. You will realize that significant amount of your time was spent on things which may not be pleasurable or enriching or important. If you have enough free time and freedom, you may have spent those hours doing something else which is more pleasurable enriching and relaxing.

Where is your time spent at? You spend big part of this "finite" time you have at work as you have to earn your living. You tend to work after hours to earn a bit more. Yes, you have to do it, compelled to do it, as you need to earn more for your many expenses. If your minimalist life style does not need a lot of money, you have a surplus from your regular earnings, you may be able to spend less time at work, freeing some precious time to do things you prefer instead of working.

It is a well-known fact that many people are compelled to spend their free time, week-ends and other holidays de-cluttering, cleaning and mending things at home where their hard-earned possessions are kept. You have to spend your time maintaining your belongings. More possessions you own, more time you have to spend caring for them and maintaining them. When you own less, you can manage attending and caring for them in shorter time, freeing up time for you to spend for better things in life.

It is a well-known fact that people spend lot of time looking for their lost items. Does your office space or work environment hold many things? You need more time to keep it organized and clean. In addition, more you own, chances are higher that your belongings getting lost among the sea of your belongings. You have to waste precious time looking for the lost items and it is not uncommon that you have to purchase stuff when they get lost and you are unable to find them when needed. They have a habit of re-surfacing when you are looking for another thing. Yes, with more stuff in your possession, more time you waste looking for them.

Have a huge closet full of clothes? How easy is it to decide what to wear in the morning? This will not be an issue if you wear a uniform for work, but having a lot to choose from makes it difficult and need more time. Also, when you have too many, things may go hiding in the invisible places and you need to spend time looking for them. Not only looking for them, but caring and maintaining them also take time. Having less free up time to do better things in life.

**Advantage 3: Freedom**

Freedom is another concept you are unable to measure. Freedom has many facets. One may like freedom to do what he enjoys such as traveling, engaging in a hobby, or just staying at home with loved ones.

Minimalistic life style will give you freedom in many ways. If you need less money for your living, you need not to work too hard, or too long, free up time and energy to use as you wish. You may be able to take leave from work or even give up work and this is a freedom many do not have. No much belongings to care for? You have freedom to be away from home doing what you like. Financial freedom you achieve with minimalist living let you free to travel, socialize, enjoy nature, pursue for fulfilling relationships, serving the less advantaged and less fortunate or pursue your spiritual journey. When you own less, you are free of worries such as loosing belongings, and need of doing competitive purchases to keep up with the latest of stuff.

**Advantage 4: Quality**

Minimalism goes hand in hand with higher quality. This is reflected in all areas of your life.

With minimalist life style, of having adequate amount of money for fewer purchases, you have the advantage of looking for the quality of your purchase regardless of the costs. When you use and have high quality belongings, your living invariably becomes higher in quality. You live richer, comfortable and sophisticated life with fewer belongings.

When you use your time doing what you enjoy, quality of the life increases.

**Advantage 5: Environmentally friendly**

Consuming less stuff in your life is friendly to the environment in many ways. You use less, waste less and throw away less. Smaller carbon foot-print on the planet, lesser contributions to the land fill, carbon emission and green-house effect, global warming, unethical labour practices in poor countries and save precious and limited water reserves of the planet.

As I described above, minimalism is not only about living with less, but there are many advantages closely associated with it. Those who live minimalistic lifestyles, are free, happy and live high-quality lives in ethical and environmentally friendly way. Please think twice when you want to buy yet another thing to your life. Let's reduce our use, save the planet and live richer, happier and free lives.

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# Minimalism and a Healthy Lifestyle

Prof. Arosha Dissanayake

A minimalist lifestyle is one based on what is essential for one's health and health of the environment. Reduced consumption, conservation, use of self-sufficient and sustainable options, with an overarching emphasis on quality over quantity are the cardinal principles of a minimalist approach to life. Minimalism and resultant decluttering of our lives can be useful in managing financial matters, optimising space utilization, communicating elegantly, attaining a calm and a resilient mind and improving health. The purpose of this article is to assess how a minimalist lifestyle complements the identified pillars of a healthy lifestyle.

Non communicable diseases (NCDs) account for more than 90 percent of disease burden in Sri Lanka. NCDs are closely linked to unhealthy lifestyles. An evolving branch of medicine is 'Lifestyle Medicine'. Prevention, treatment as well as reversal of NCDs is attempted with prescription of lifestyle changes. There are six pillars of lifestyle medicine. Healthy eating where the emphasis is on whole food and plant-based eating, physical activity, restorative sleep, stress management, positive social connections and avoiding harmful substance use constitute a healthy lifestyle.

The six pillars of healthy lifestyle in a minimalist way are mentioned as follows.

1. Preparing your own meals to whatever extent possible and minimising obtaining food from restaurants is the minimalist way. This is less expensive, healthy and emotionally fulfilling. We have control over what foods we eat, the ingredients and spices used and the quantity prepared. The other minimalist practice is to replace all we drink with

pure water as much as possible. Tea is a healthy drink but the milk and sugar we add take away its innate goodness. Fizzy drinks, energy drinks and artificial juices are expensive and carry health hazards in terms of high sugar content as well as chemicals ingested.

2. Saying no to gymnasium memberships and exercise equipment is the minimalist way. Instead of spending all our time with TV and computer screens, we need to get outside for gardening and going on walks. We could avoid elevator queues and walk up the stairs. Wherever possible we could walk to or cycle to work instead of using cars and buses.

3. Warding off distractions such as electronic devices and night outings to ensure a healthy number of hours of sleep is the minimalist way. We need to manage our time in such a way that we are stingy about our time and we spend it on things which have a positive effect on our lives. Once we have time which we created, one of the most important commodities that we will acquire using this wealth will be quality sleeping time, to restore and rejuvenate our bodies.

4. Decluttering not only our house but our mind too is the minimalist way. This helps to reduce stress in our lives. Having more time by doing only the things which matter helps us become more organised, reduce procrastination and thereby reduce stress. Our minds are constantly, randomly shooting forwards and backwards dwelling on past disappointments and future worries resulting in anxiety, depression and despair. Decluttering our minds of these thoughts and living in the 'present moment' help us reduce stress. One of the most important stressors in our life is the management of our personal finances. Minimalist financial living helps us to 'live large' that is to live without the trappings of being in debt. This helps us to create less stressful lives for us. We need to be mindful of 'going minimalist' itself becoming an additional stress on our minds. Hence it is important to go slow on the way to becoming a minimalist, taking

one small step at a time as opposed to overnight transformation into a minimalist making drastic changes to our lifestyle.

5. Cultivating and devoting time on meaningful relationships is the minimalist way. Even becoming a minimalist is easier if we walk the journey with another person keen on minimalism. Like minded people could inspire the other and experience sharing can be most productive.

6. Avoiding substance use, be it alcohol, tobacco or other recreational drugs is the minimalist way. The health benefits of these actions have been proven comprehensively over the past few decades.

Minimalism helps us to save money and time both. Most importantly it helps us to


figure out what is really important to us, in life. In this endeavour to attain a healthy lifestyle with minimalist practices it is important to follow a few simple steps in order to succeed. We need to go slow, without rushing, adding small successes along the way. We need to identify our individual goals to achieve in our minimalist ways. A course of action to get to the goals needs to be charted. It will be good to have a partner in the journey so that we could discuss our ideas, difficulties and feelings. There may be moments of self doubt and we will need courage to persist. The benefits may take time in coming but we will reap those only if we hang in there during moments of doubt and difficulty.

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# Microbial Biofilms to Minimize the Usage of Mineral Phosphorus Fertilizers in Rice Cultivation

**Mrs. J.P.H.U. Jayaneththi, Prof. D.M.S.H. Dissanayaka**

Rice cultivation is the major livelihood of most of Sri Lankan farmers for ages. About 1.8 million farming families are engaged in paddy cultivation island wide, and over 70% of paddy lands are situated in the dry zone with suitable climatic conditions required for the crop Most farmers in the dry zone generally belong to the low-income group, thus are not concerned about environmental hazards of chemical agriculture. They are primarily interested and concerned in maximizing their crop yields and eventual profits. Therefore, large quantities of chemical fertilizer (mainly NPK) and agrochemicals have been regularly used to sustain a reasonable crop yield, which has in fact affected the environment adversely. The raw materials used to manufacture fertilizers and agrochemicals contain considerable amounts of toxic heavy metals such as Arsenic (As), Cadmium (Cd) and lead (Pb) as impurities. Their long-term applications can lead to contaminate and accumulate heavy metals in the soil, and can leach into surface and ground water. The application of synthetic Phosphorous (P) fertilizers, mainly Triple Super Phosphate (TSP) (Fig. 1) adds Cd as a main impurity to the soil, which has been shown to have a link to chronic kidney disease of unknown etiology (CKDu) in Sri Lanka

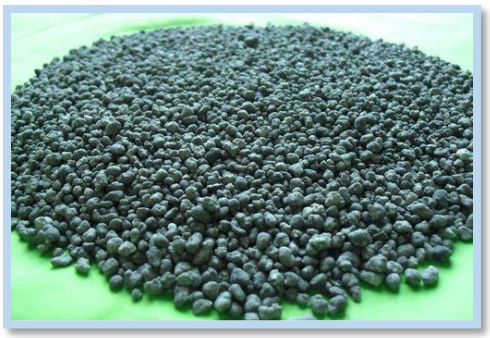

**Fig.1: Triple Super Phosphate (TSP) Fertilizer**

Eppawala Rock Phosphate (ERP) (Fig.2) is a locally-available natural resource containing about 27% to 40% $P_2O_5$ whereas TSP, a highly concentrated chemical P fertilizer, contains 46% $P_2O_5$. Since, a comparatively larger quantity of ERP is required to replace the Department of Agriculture (DOA) approved dosage of TSP, in order to meet the P requirement of rice cultivation. Generally, larger quantities of any inputs may not be that attractive to farmers. Therefore, it is important to concentrate P in ERP, to reduce the quantity required for rice crop. This can be done by increasing the P availability in ERP further by adding a more improved microbial biofilm (MB) with the ability of P solubilization.

MBs are the complex communities of multiple microbial species attach to the surfaces or interfaces. The soil, animals and plants are the habitats for naturally occurring MBs, which may be beneficial or harmful There are three major types of MBs occurring in the soil. They are;

- Bacterial biofilms
- Fungal biofilms
- Fungal-bacterial biofilm (FBB)

**Fig. 2: Eppawala Rock Phosphate (ERP) Fertilizer**

The bacterial and fungal biofilms are formed on biotic or abiotic surfaces of the soil. In FBBs, fungi act as the biotic surface to which bacteria adhere (Fig. 3).

Many MBs in soil consists of phosphorus solubilizing microorganisms (PSM) with the ability to produce organic acids which which enhances the solubilization of the unavailable soil P, thus making them available to plants. Further, the application of MBs help to enhance the soil microbial biomass involved in biological functions, to increase mineralization and solubilization of nutrients. Moreover, the increased soil microbial diversity contributes positively to crop growth through other direct and indirect benefits.

**Fig. 3: A microscopic view of a microbial (fungal-bacterial) biofilm**

These beneficial MBs that developed in-vitro as biofertilizers are called biofilm- biofertilizers (BFBFs). Previous studies have shown that application of BFBF in rice cultivation can reduce chemical fertilizer dosage recommended by the Department of Agriculture (DOA) for rice. Further developed a MB enriched ERP (biofilm-ERP) could replace the TSP application in rice cultivation. Today, biofilm-ERP is extensively used as a successful alternative for TSP fertilizer in major rice growing districts in Sri Lanka.

Up to recent time, a significant fraction of government revenues was spent on importing fertilizers annually. The government has to bear a major part of this cost, since chemical fertilizers for paddy are given to farmers free of charge. The market prices of TSP is considerably higher than ERP. If TSP could be replaced by ERP, the cost for imported fertilizers would be reduced drastically, thus paving the path for the development of sustainable agro-ecosystems that have both economical and ecological benefits.

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# NSF laid the foundation towards the young scientists.

**Apeksha Herath**

National science foundation annually conducts various programs targeting school children. The objective of these competitions are to enhance innovative thinking, creativity, and investigative abilities of the school community in order to build citizens with a capacity to contribute for the socio-economic development of the country.
Accordingly, the following competitions were held during the year 2022.

**(1) Science Research Project Competition (SRPC)**

This competition was targeted for school children of grade 9 and upwards with the objective of inculcating the research culture school level as well as enhancing innovative thinking, creativity, and investigative abilities. The programme was commenced from the year 2008 onwards. The students participating in competitions were expected to conduct a research project following the correct scientific methodology. Hence, NSF provide the assistance of a senior scientist as a supervisor and mentor to each project and direct them for the successful completion of the project.

Following is a tabulation of this work carried out in this programme.

**Table 01:- Selected best 10 projects of the Science Research Project Competition-2022**

| Title of Project | School | Students | Teacher in charge | Principal Supervisor |
|---|---|---|---|---|
| *Cyprinidae* family fish diversity in Diyagama Ela – South West ichthyological Zone of Sri Lanka. | D.S. Senanayake College, Colombo 07 | AM Udula Methsara Abeysinghe | Ms W.K.N.J. Amarasinghe | Dr Dewanmini Halwathura<br>Department of Zoology and Environment Science,<br>Faculty of Science,<br>University of Colombo |
| Investigation of anti-cancer activity of bioactive compounds present on plants in Sri Lanka for estradiol synthesis pathway associated with breast cancer via in-silico approach | St Joseph Vaz College, Wennappuwa | M. Sahan Clement<br>Shavinda Fernando | Ms B.L.C. Lalani Balasuriya | Prof. R Senthilnithy<br>Department of Chemistry,<br>Faculty of Natural Sciences,<br>Open University of Sri Lanka<br><br><u>Supervisor</u><br>Mr Dushanan Ramachandran<br>Open University of Sri Lanka |
| Conversion of a two-stroke petrol engine to operate using a mixture of bio gas and petrol | Ka/ Dehi/Walagamb a M.V, Galapitamada | K.A Isuru Chamara<br>Lakshan Kularathna<br>M. Ashan Sankalpa Weerasuriya<br>S.A Kavindu Anuradha Thilakarathna | Ms W.A.M. Sasanka Dunumala | Dr Indrani Kularathne<br>Applied Mechanics Lab,<br>Department of Mechanical Engineering,<br>Faculty of Engineering,<br>University of Peradeniya |
| Investigating the effectiveness of various storage settings to reduce the microbial growth on toothbrushes | Musaeus College, Colombo 07 | Siluni Sihansa De Silva | Ms M.D. Lochana Mihirani | Dr. Thushari Dissanayake<br>Department of Microbiology, Faculty of Medical Sciences,<br>University of Sri Jayawardenapura |
| Evalution of field level efficacy of *M. micrantha* solvent extracts againts aphids in brinjal crop and preliminary study for commercialization | Dharmaraja College, Kandy | A. Y. B. Weerakoon | Mrs W. M. T. S. Wijesundara | Dr Wikum Jayasinghe<br>Department of Agriculture Biology,<br>Faculty of Agriculture,<br>University of Peradeniya |
| A preliminary study on floral sap yield determination of naturally grown Kithul palms | Lihiniyawa Kanishta Viidyalaya , Lihiniyawa | M.W. Ayesha Nikethanie<br>H.R.Navodya Divyanjali Bandara<br>Kavinsa Dewmini Wickramanayake | Ms N.K. Weerasekera | Prof. Lanka Ranawaka,<br>Department of Agricultural Biology,<br>Faculty of Agriculture,<br>University of Ruhuna |
| Qualitative analysis of thermal comfort in a dry zone school classroom | Peramduwa Vidyala, Kanthale | P.G. Kavindu Sandeepa<br>P.B. Thushani Kaushalya<br>B.M. Manisha Gimhani | Mr Sarath Dasanayake | Eng. I.P.T.S. Wickramasooriya.<br>Faculty of Engineering Technology,<br>Department of Mechanical Engineering,<br>Open university of Sri Lanka |

| | | | | |
|---|---|---|---|---|
| Study the Production of ecofriendly degradable film from extract of *Pontedeia Crassipe*s pure powder with gelatin mixed | St. Pauls Girls School, Milagiriya | Medini Thrishala Thudahewage | Mr D.B. Nayana Kumara | Dr T.M. Sampath U. Gunathilake<br>Department of Polymer Science, Faculty of Applied Sciences, University of Sri Jayewardenepura |
| Problems associated with sand mining in Upparu Delta region of Kinniya | T/Kinniya Central College, Kinniya | M.R. Mohamed Baheej Al Barrah | Mr M.M.A. Abrar | Dr V. Anavarathen<br>Unit of Siddha Medicine, Faculty of Applied Sciences, Trincomalee Campus, Eastern University of Sri Lanka<br><br><u>Supervisor</u><br>Eng. Mohamed Suhail. M. P |
| Evalution of Antidiabetic Activity of Flower of Ranawara (*Cassia auriculata L.*) in High Glucose Induced Zebrafish Embryos | Thurstan College, Colombo 07 | Nadeeja Prathibhana | Ms Upeksha Abeysekara | Dr Chanika Jayasinghe<br>Department of Zoology, Faculty of Natural Sciences, Open University of Sri Lanka |

**(2) Kids Naturalist programme 2020/21**

This programme was organized for primary students to generate interest in learning science, and to inculcate scientific thinking at an early age of life. The programme was initiated during the time of the 1st wave of the pandemic situation to get students to be engaged in productive activity while at home. Around 1200 applications were received for participation in this programme with around 500 successful submissions evaluated to select top performers.

**Table 02 :- Selected best nature journals – Grade 01**

| Category: Grade 1 | | |
|---|---|---|
| | **Name of the winner** | **School** |
| 1 | G Praharsha Kaushan Fonseka | Kingswood College , Kandy |
| 2 | Rajkumar Sanjana | J/Holy Family Convent National School, Jaffna |
| 3 | H B Ikitha Theshala Devapriya | Royal College , Colombo- 07 |
| 4 | A H Sanuji Thilanya Wijesinghe | NWP\Giri \Rathanalankara M.V, Alawwa |
| 5 | J T Senya Nethlini Jayabahu | St Joseph's Balika Maha Vidyalaya, Kegalle |
| 6 | W A Kaushalya Chathurya Weerasooriya | NWP\Giri \Rathanalankara M.V, Alawwa |
| 7 | G P G Pahandi Adithya Thimali Nawarathna | K\Sujatha Girls' National School, Galagedara |
| 8 | Nadil Methmika Gamage | NWP\Giri \Rathanalankara M.V, Alawwa |
| 9 | Derick Liza | J/Holy Family Convent National School, Jaffna |
| 10 | K.H.Lometh Dewthisa Bandara | NWP\Giri \Rathanalankara M.V, Alawwa |

**Table 03 :- Selected best nature journals – Grade 02**

| Category: Grade 2 | | |
|---|---|---|
| | **Name of the winner** | **School** |
| 1 | Laurendi Wilwalaarachchi | Musaeus College, Colombo 07 |
| 2 | M A Fathima Ilmiya | Ak/Ayesha Muslim Ladies College, Akkaraipattu |
| 3 | Okitha Thanujitha Vidana Gamage | Dharmaraja College, Kandy |
| 4 | Kulani Vihansa Kandage | Musaeus College, Colombo 07 |
| 5 | H M Hansani Nimeshika Herath | K\Sujatha Girls' National School , Galagedara |
| 6 | P K Sasmi Dinara Sithmini | Bishop's College, Colombo 03 |
| 7 | P W Shalani Nuwangana Withanage | NWP\Giri \Rathanalankara M.V, Alawwa |
| 8 | P.K. Siduhath Akil Aryan Priyadarshana | NWP\Giri \Rathanalankara M.V, Alawwa |
| 9 | V A Themiya Ranumitha Samarawickrama | Bright International School, Kandy |
| 10 | B V Mihin Methunija Bandara | Seethawaka Central College, Avissawella |

**Table 04 :- Selected best nature journals – Grade 03**

| Category: Grade 3 | | |
|---|---|---|
| | **Name of the winner** | **School** |
| 1 | Thenuli Pahanya Shenari liyanage | K\Sujatha Girls' National School, Galagedara |
| 2 | R.G. Oshadha Sithum Premathilaka | Delta Gemunupura Maha Viduhala, Pussellawa. |
| 3 | H.D. Nulan Neyjitha Heiyanthuduwa | Highlands College, Maharagama |
| 4 | K.A. Indusha Uvindi Karunathilaka | NWP\Giri \Rathanalankara M.V, Alawwa |
| 5 | M.G. Uwahas Chithira Bandara | Mahanama College, Kandy |
| 6 | Y.M. Sethmi Niwandhana Kumari Wijewardhana | K\Sujatha Girls' National School, Galagedara |
| 7 | Pulasi Gihainya Ratnayake | Musaeus College, Colombo 07 |
| 8 | Udev Damhiru Palliyage | Dharmaraja College, Kandy |
| 9 | Logeswaran Lakshaan | St.Thomas' College, Bandarawela. |
| 10 | G I Aeshan Kavindya Fonseka | Kingswood Collage, Kandy |

**Table 05 :- Selected best nature journals – Grade 04**

| Category: Grade 4 | | |
|---|---|---|
| | **Name of the winner** | **School** |
| 1 | Kejaaneha Kumaran | Chundikuli Girls' Collage, Jaffna |
| 2 | Senuli Rashwitha Menon | Mahamaya Girls' College, Kandy |
| 3 | R.L. Kavinu Bometh Dayasena | Seethawaka Centarl College, Avissawella |
| 4 | Raviduni Yathindra Somarathna | Girls' High School, Kandy |
| 5 | K.K.V.Sandini Gayashi Kariyawasam | K\Sujatha Girls' National School, Galagedara |
| 6 | Dinula Yasasri Dissanayaka | A/Galenbindunuwewa Model Primary School, Galenbindunuwewa |
| 7 | W R D M O M B Wickramasinghe | Dharmaraja College, Kandy |
| 8 | N.R.Chamathni Jananya Bandara | St Joseph's Balika Maha Vidyalaya, Kegalle |
| 9 | Hasal Sanujaya Bandara Dissanayake | Delta Gemunupura Maha Viduhala , Pussellawa. |
| 10 | Advith N. Tourkine Panawala | Carey College, Colombo 10 |

**Table 06 :- Selected best nature journals – Grade 05**

| Category: Grade 5 | | |
|---|---|---|
| | **Name of the winner** | **School** |
| 1 | Izmah Riyas | Kg/Mw/Nooraniya Muslim Maha Vidyalaya, Uyanwatta, Dewanagala. |
| 2 | Batuwitage Dulansa Saseni | Ch/Nath/Holy family Convent, Marawila |
| 3 | W.M.K.G.Vishmi Gayesha Wijerathna | K\Sujatha Girls' National School, Galagedara |
| 4 | M.H.B.Themindi Senuri Bandara | Maliyadeva Adarsha Maha,Vidyalaya, Kurunegala |
| 5 | Sanjana Vaseekaran | Chundikuli Girls' Collage, Jaffna |
| 6 | P.M.Sandali Amaya Ekanayaka | K\Sujatha Girls' National School, Galagedara |
| 7 | N.A.G.Kaushika Lalithadithya Ekanayake | Dharmaraja College, Kandy |
| 8 | V A Thejana Mandini Samarawickrama | Vision International School, Kandy |
| 9 | Minudi Methsandi Melewwe Thanthri | G/ Southlands College, Galle |
| 10 | Aksharaa Senthooran | Chundikuli Girls' Collage, Jaffna |

**Table 07 :- Selected best nature journals – Grade 06**

| Category: Grade 6 | | |
|---|---|---|
| | **Name of the winner** | **School** |
| 1 | HA Anugi Amasha Nikklesha | Wp/Ho/Janadhipathi Vidyalaya-Avissawella |
| 2 | W G N I Prabashwara | Halambagala Maha Vidyalaya -Nikawaratiya |
| 3 | R.D Prarthana Dewmini Jayaweera | Ku / Perakumpura National School-Solewawa |
| 4 | R.D. Shehara Nethmi | Ke/Dehi/Basnagala Maha Vidyalaya- Basnagala |
| 5 | D.M. Yesith Senvidu Bandara Daundasekara | Ranabima Royal College-Gannoruwa-Peradeniya |
| 6 | H.B. Suraweera | Trinity College- Kandy |
| 7 | M. M. Shaima | Ak/Ayesha Muslim Ladies College, Akkaraipattu |
| 8 | 1. Anun | BT/KK/Chenkalady Vivekananda Vidyalayam - Chenkalady |
| 9 | T G R S K Aberathne | Ranabima Royal College-Gannoruwa-Peradeniya |
| 10 | P. Kabistan | Jaffna College- Vaddukoddai |

### (3) Star Rating Competition 2022

This programme was organized for the school community to encourage the extracurricular activities related to science subjects. The performances of the School Science Societies registered with NSF were evaluated based on the performance of the society. The winning schools were awarded with star ratings. Accordingly, the performance of the science societies during the period of 2019-2022 were evaluated based on their activities.

**Table 07 :- Winners of the star rating competition**

| Star rating | School | Name of the Principal | Techer in charge | Details of Society |
|---|---|---|---|---|
| **5 Star** | **WP/Ng/ Harischandra National School,Negombo** | G.P.H.A.A.Jayathilaka | Ms A.T Nelka Munasinghe | President: Minada Nethmira Weerasooriya<br>Secretary: K. Binary Nimhara |
| **4 Star** | **Paddiruppu MMV,Kaluwanchikudy** | M.Sabeskumar | Mr Selvaraj Thevakumar | President: K.Vojithan<br>Secretary: M.Veedansana |
| **3 Star** | **Thurstan College, Colombo 07** | Mr.W.A.P .J Wickramasinghe | Ms Upeksha Abeyeskara | President: Kaveen Hirumal Karunarathna<br>Secretary: Kavindu Sandaruwan Kothalawala |

### (3) Teacher's Award for Popularization of Science 2022

NSF organize the Teacher's Award for Popularization of Science to evaluate the contribution of teachers who assisted in promoting science amongst school children. Only teachers (government or private) of the schools of science societies registered with the NSF were eligible to apply. The main objective of the programme was to encourage teachers to contribute for the promotion of scientific thinking and improving of scientific knowledge, skills and attitudes among the school children, and the public in the area.

**Table 08 :- Winners of the Teacher's award**

| | Award | Name of the teacher | School |
|---|---|---|---|
| 1 | Teacher's Award | Ms A. Thushari Nelka Munasinghe | Harischandra National School, Negombo |
| 2 | Commendation | Ms Chamari Tharangika Colambage | Kg/St Mary's College, Kegalle |
| 3 | Commendation | Mr. Selvaraj Thevakumar | BT/ PD/ Paddirippu MMV School, Kaluwanachikudy |
| 4 | Appreciation | Ms. Tekla Manoja Sudarshani | Tangalle Balika Vidyalaya, Tangalle |

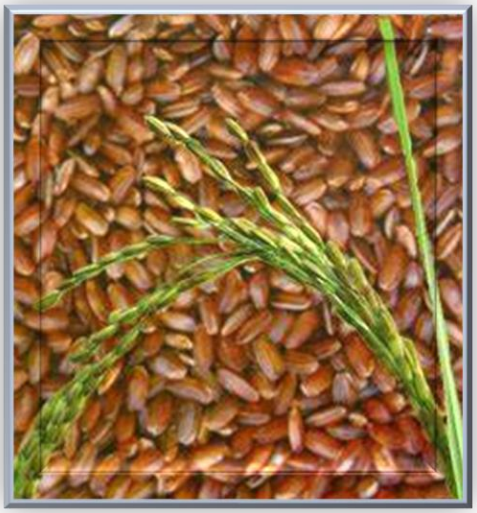
NSF appreciate the winners of the competitions and their commitment to achieve successful outcomes from their projects. The significant contribution of the teachers and the principal supervisors towards the process of building a young scientist is very much appreciated. Further NSF is very thankful for the panel of judges who contributed for the success of the competition.

**Apeksha Herath**
Scientific Officer
Science Communication and Outreach Division
National Science Foundation.

# Effect of neem priming on seed germination and vigour of four traditional rice varieties of Sri Lanka

Ms.M.O. Galappaththi, Prof. K.M.G.G .Jayasuriya & Dr. N.S. Gama-Arachchige

Rice is one of the most important staple foods in the world. More than 90% of the world's rice is grown and consumed by Asian people. Traditional rice varieties that have been used by Sri Lankan farmers are with low yields. Thus, rice improvement programs in Sri Lanka have attempted to develop new rice varieties with higher yields. However, most of these new varieties are heavily dependent on agrochemical usage. Usage of extensive levels of Agro-chemicals is a significant problem as it creates many health and ecological problems. Most agrochemicals used in rice cultivation are not environmentally friendly and caused many human health problems. With the emergence of Chronic Kidney Disease, a new debate has been started on the use of agro-chemicals. Due to the current debate on health issues, organic farming and traditional rice varieties were promoted, as many of the traditional rice varieties are claimed to have health benefits. Traditional rice varieties were reported to contain chemicals with antioxidant properties, thus reducing non-infective diseases. Therefore currently, these traditional varieties



have a good market value especially if they were produced organically. However, several issues including seed quality issues like low germinability and low storability of traditional rice seeds affects the popularization of these varieties. Neem extract has been used as pesticide and as a treatment for many fungal and bacterial diseases in crops. Neem seed extract is effective in improving seed quality and could be used as an organic treatment for improving seed quality.

Considering the reported benefits of neem, a study, on seed priming using distilled water and neem seed extracts with different concentrations was used to enhance the seed performances of four selected traditional rice varieties. Further, effects of different priming times using above extracts were also tested under laboratory conditions. Seed germination and vigour (performance of seeds) were used to evaluate the effects of these treatments on seed quality. Seed vigour was determined by measuring root, and shoot lengths and seedling emergence in glasshouse conditions.

Statistically analyzed data showed that seed germination and seedling emergence percentage, and seed vigour of Kaluheenati, Kuruluthuda, Maawee and Madathawalu were improved by seed priming. Specially neem priming has improved the above parameters significantly. However, different varieties responded differently to different priming treatments. For kaluheenati, priming for 24 hrs using 50 % neem seed extract was the best. Priming using 25 % neem extract for 72 hours has improved the seed quality of Kuruluthuda,variety. Priming with 25% neem extract for 48 hours was most effective for Maawee. Full-strength neem extract priming for 72 hours improved the germination and seedling emergence of Madathawalu. Thus, priming with neem can be recommended to improve the seed quality of these traditional rice varieties. As neem seed extract contain no synthetic chemicals, neem-priming treatment could also be recommended for use in organic farming. Further, neem-priming could be recommend for the enhancement of seed quality of the traditional rice varieties and through which these varieties could be popularized among farmers.

Read the full article https://jnsfsl.sljol.info/articles/abstract/10.4038/jnsfsr.v49i4.10336/

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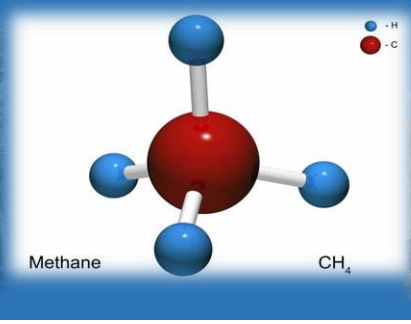
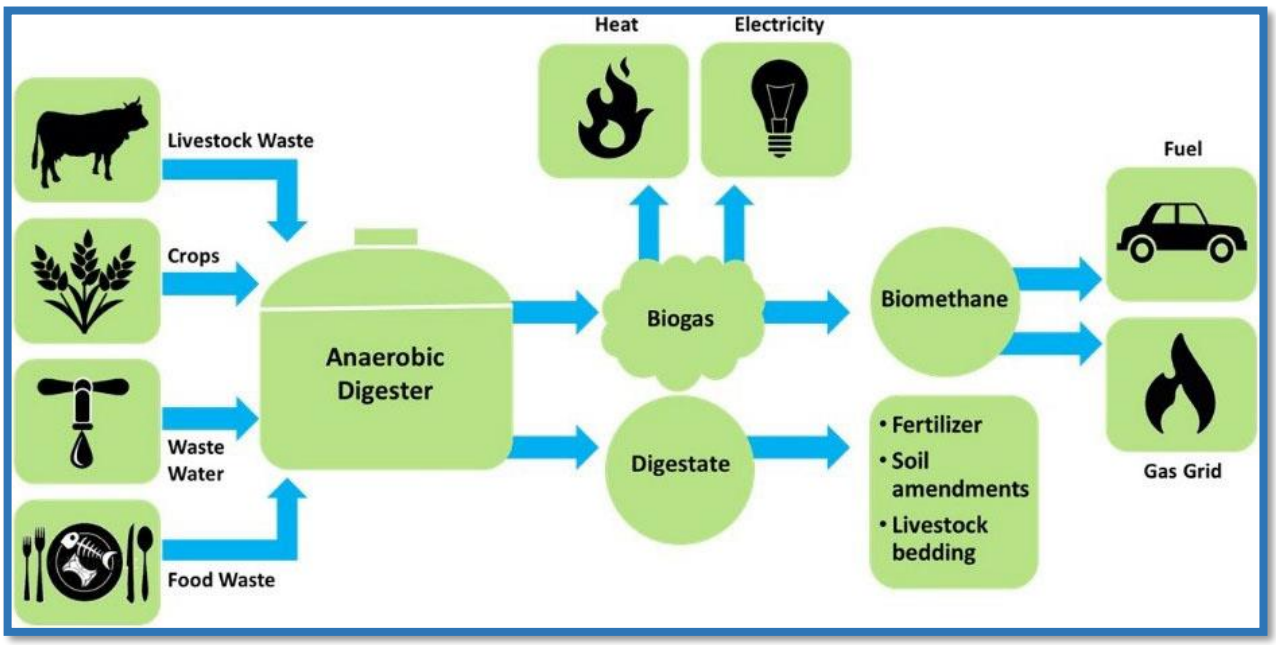
# Optimization of high solids batch anaerobic co -digestion of lignocellulosic biomass and cow dung under mesophilic temperature conditions

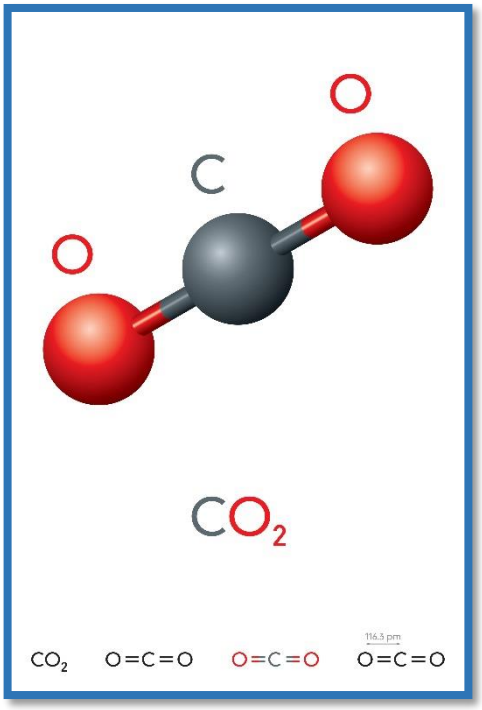
A.L. Wickramaarachchi, P.G. Rathnasiri, M. Narayana, M. Torrijos (Late) & Renaud Escudie




Anaerobic digestion (AD) is a process in which microorganisms break down biodegradable material in the absence of oxygen. Anaerobic digestion can be used to treat various organic wastes and recover bio-energy in the form of biogas, which contains mainly Methane ($CH_4$) and Carbon Dioxide ($CO_2$). Biogas generated from AD process has been regarded as a promising source of renewable energy and it can be used for various applications such as: generation of heat or electricity from burned biogas, liquefied and compressed biogas as a vehicle fuel. Also, during the production of biogas nutrient rich fertilizer generates as a by-product. Biogas can be produced from different types of organic materials such as industrial waste water, food waste, sewage sludge, agricultural waste and municipal solid waste (MSW). Lignocellulosic plant residues such as rice straw (RS), wheat straw, sugar cane bagasse and corn stover, represent the most promising renewable feed stock for biogas production, as these are widely generated during agricultural activities all over the world.

In this study, optimal operating conditions for the anaerobic co-digestion of RS with cow dung (CD) in batch mode, with and without leachate recirculation, were assessed under mesophilic temperature conditions. Because of the high solids






content of this feedstock, high solids anaerobic co-digestion (HS-AcoD) in batch mode was also investigated.

HS-AcoD of rice straw and cow dung provides more balanced nutrient requirement for the AD process (i.e. optimal C: N ratio, macro and micro nutrients) and buffering capacity.

However, lower efficiency and effectiveness of cow dung as an inoculum source in HS-AcoD process was identified. In order to successfully operate a batch reactor, initially rice straw and cow dung should be mixed in the ratio of 1: 26 respectively in % W/W.

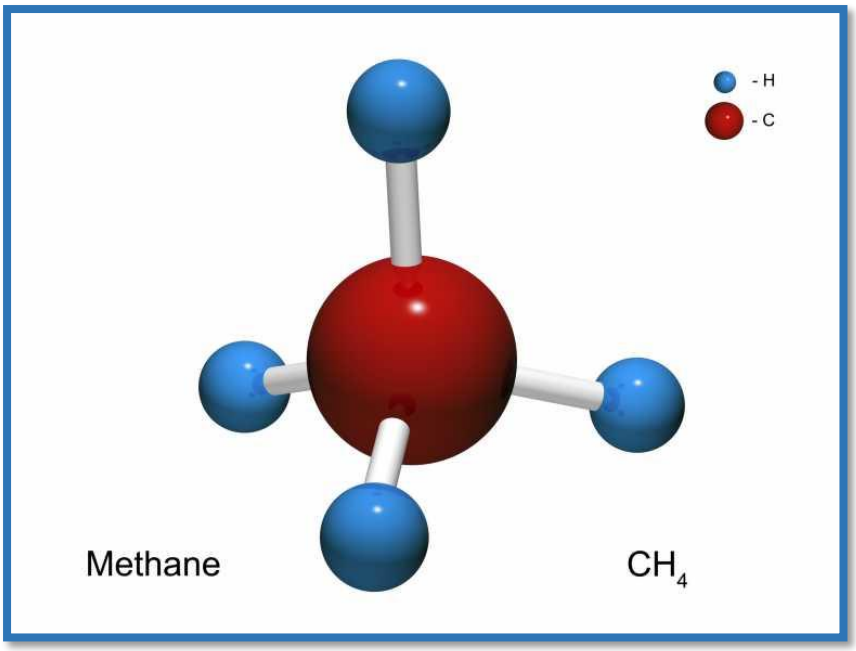
Through the re-use of digestate strategy and leachate recirculation strategy, significant reduction of lag phase (from 15 days to almost 0 days) and increase of specific methane production rates were achieved.

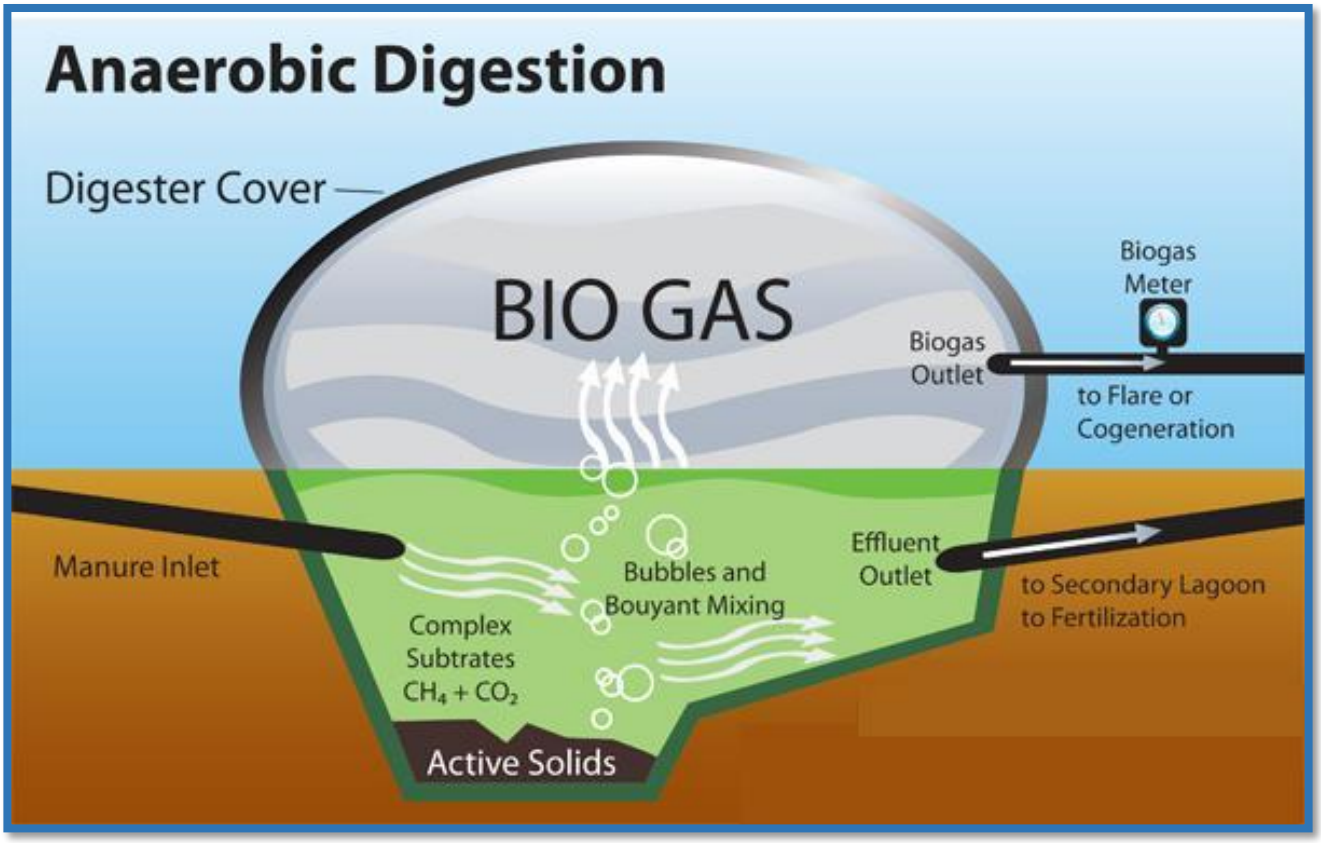
For 55 days of digestion time period 103% increase of cumulative specific methane volume was achieved in the reactor having initial rice straw VS (Volatile Solids) concentration ($S_0$) of 29 g VS/kg mixture which digestate re-use strategy applied, compared to the reactor having same $S_0$ which only operated with a mixture of rice straw and cow dung.

Volatile fatty acids (VFA) accumulation within the substrate mixture can be avoided by flushing out, through the leachate recirculation. Also, stable pH, reduction of lag phase, increase of specific methane production rate and cumulative specific methane volume can be achieved.

Leachate recirculation can be stopped after 15 days as reactors were reached stable conditions after this period.

For the same $S_0$ Leach bed reactors (LBRs) showed higher specific methane yields compared to simple batch reactors which digestate re-use was applied. For example specific methane yield observed in LBR which $S_0$ of 30 was 273 mL $CH_4$ / g VS, and for the simple batch rector which had same $S_0$, specific methane yield was 222 mL $CH_4$/ g VS. Therefore, it can be concluded that the degradation kinetics were improved in LBRs compared to simple batch reactors as maximum specific methane production rate of LBR which $S_0$ of 30 was 16 ml/g VS/day compared to simple






batch reactor which has the same $S_0$ having maximum specific methane production rate of 12 ml/g VS/day.

Higher biodegradability of rice straw was achieved with the application of digestate re-use and leachate re-circulation strategies. And also, from these strategies it was able to achieve successful and stable reactor operation with much higher Total Solids (TS) % (i.e., TS% > 15) and higher VS concentration of rice straw (i.e., $S_0$ > 30).

However, specific methane yields and specific methane production rates were reduced with the increase of lignocellulosic concentration, particularly initial RS concentration within the reactors. Therefore, further investigations should be done to find the threshold values (i.e. for TS% and $S_0$) of HS-AcoD of lignocellulosic biomass and to increase the performance of HS-AcoD of lignocellulosic biomass.

Read the full article

https://jnsfsl.sljol.info/articles/abstract/10.4038/jnsfsr.v50i1.10358/

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## I. Minimalism, Is it only about living with less

1. Living a life possessing less belongs gives one significant relief.
2. Expensive but high-quality products usually have shorter warranty periods.
3. It is a well-known fact that people spend a lot of time looking for their lost items.
4. Freedom is another concept that one cannot measure.
5. Consuming less stuff in one's life is unfriendly to the environment.

## II. Microbial Biofilms to Minimize the Usage of Mineral Phosphate Fertilizer in Rice

1. The application of synthetic Phosphorus fertilizers, mainly Triple Super Phosphate adds Cd as a main impurity to the soil.
2. Eppawela Rock Phosphate is a locally available natural resource containing 27 – 40 % $P_2O_5$.
3. It is not important to concentrate P in Eppawela Rock Phosphate to reduce the quantity required for the rice crop.
4. Bacterial and fungal biofilms are formed on biotic and abiotic surfaces of soil.
5. Only an insignificant amount of chemicals and agro-chemicals have been used to sustain crop yields.

## III. Minimalism and Healthy Lifestyles

1. Non-Communicable Diseases account for more than 90 percent diseases burden in Sri Lanka.
2. A Minimalist lifestyle is not one based on what is essential for one's health and the health of the environment.
3. Preparing your own meals to whatever extent possible way is a minimalist way.
4. Saying no to gymnasium membership and exercise equipment is the minimalist way.
5. It is important to go fast on the way to become a minimalist.

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## IV. Effect of Neem Farming on Seed Germination and Vigour of Four Traditional Rice Varieties of Sri Lanka

1. Most agrochemicals used in rice cultivation are not environmentally friendly.
2. Currently traditional varieties have a good market value, especially if they are produced organically.
3. Priming with 25 % Neem extract was not very effective for *Maawee*.
4. Anaerobic digestion cannot be used to treat organic waste.

5. Lower efficiency and effectiveness of cow dung as an inoculum source in HS-AcoD process was identified.

## Answers

(1) 1. Yes, 2. No, 3. Yes, 4. Yes, 5. No
(2) 1. Yes, 2. Yes, 3. No, 4. Yes, 5. No
(3) 1.Yes, 2. No, 3. Yes, 4. Yes, 5. No.
(4) 1.Yes 2. Yes, 3. No, 4. No

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