

PROFIE

PROF. VARKEY MATHEW

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Date of Birth: 9th July 1953.

Position Held Now: CEO Pentoreum Innovations Private Limited, which is Registered as a Start-Up Venture with Government of India.

Education:

- **B.Sc. Chemistry**, Kerala University, India; March 1974;
- **M.Sc. Analytical Chemistry (1st Class & 2nd Rank)**, Kerala University, March 1976;
- **Diploma in Computer Applications**, September - November 1993;
- **Course in Social Research Methodology**; Center for Development Studies (CDS), Thiruvananthapuram;
- **Course in Energy and Environmental Conservation and Waste Management**; and
- **Certificate Course in Yoga Practice and Yoga Therapy**; July – December 1988.

INDIA PATENTS Granted:

1. PARTICLE BOARD MADE OF CELLULOSE NANOFIBER PREPARED FROM WATER HYACINTH [India Patent 314150]; Patentee: PROF. VARKEY MATHEW; Date of granting: 13TH JUNE 2019.

2. PROCESS FOR MAKING POLYMERIC MATERIAL OF CELLULOSE NANOFIBER FROM WASTES OF PLANTAIN AND BANANA PLANTS [India Patent 244800];

Patentee: Prof. Varkey Mathew, Mr. Cheloor Unnikrishnan Nair and Mr. Padmanabhan Sivasankaran

STEPS TAKEN FOR IMPLIMENTING THE INNOVATION

A Company “Pentoreum Innovations Private Limited” has been registered for establishing a Manufacturing Units, along with Laboratory facilities for further Research to make many more products of various applications:

By making use of Water hyacinth, POLY-FIBRILLATED CELLULOSE RESIN is prepared and with this resin Laminated Particle Board, Medium Density Fiber Board, Floor Tiles, Ceiling Boards, etc., are to be MANUFACTURED.

The Company is registered as a Start-Up Venture, by Government of India Scheme.

Professional Experience:

- **Lecturer in (Post-Graduate Department) Chemistry**, Baselius College (Affiliated to Mahatma Gandhi University), Kottayam; September 1976 to March 2006;
- **Professor and Head of the Post Graduate Department of Chemistry** - April 2006 to March 2009;
- **Chairman of University Examination Boards for M.Sc. Chemistry Theory and Practical Examinations** for 1st, 2nd 3rd and 4th Semesters, from 2003 to 2009.
- **Head of the Department of Chemistry**, Mount Zion Engineering College for Women, Chengannur; July 2010- March 2011.
- **Principal**, Holy Cross College of Management and Technology, Puttady, Idukki District, Kerala State; October 2011 – September 2017.

Co-curricular Activities & Research Projects:

- **Sustained Research activities**, as personal venture, for **Energy and Environmental Conservation** (leading to innovations); Research leading to “Generation of Wealth from Wastes”;
- **Conducting Training and Awareness Classes** for College and School Students, as well as Teachers, in Energy and Environmental Conservation including Waste Management, to Generate Wealth from Wastes, during week-ends and Holidays from 1991 onwards.
- **Research Project** for ‘**Solid Waste Management in Kottayam Town**’; Sponsored by KRPLLD under **Center for Development Studies (CDS)**; Project fund received, Rs. 270,000/-; **Study including Experiments in Waste Processing like Vermicomposting and Biogas generation** conducted; September 1999 – December 2003.

- **Research related to Waste Control and Management: Practical Experimental Studies in Vermicomposting and Biogas Production from Household Organic/ Kitchen wastes, as solutions for Solid Waste Management.**
- **Practicing Organic Farming** and also the use of Biofertilizers and organic Insecticides/Pesticides in **Traditional ways of Horticulture.**
- **Providing Orientation and Guidance Programs** for College and School Students, (as well as Teachers who monitor them), for Science Projects to be presented on various **Platforms / for Courses, from 1990 onwards; Subjects included Waste Management Techniques, Farm Produce/Food Preservation, Organic Farming, Value addition to Farm Produces, Energy Conservation Practices, Water Conservation/ Rain water Harvesting, Waste Management including Reduce, Reuse, Recycle, etc., Principles & Practice, etc., etc.** (Many students could win prizes even up to National Science Exhibitions)

Award Received: Air India – Manorama BEST ‘TEACHER – LEARNER’ Award for Kottayam District, 2006.

Social / Political Activities

Conducting Yoga Training Classes / Yoga Therapy to Men, Women and Children, from 1990 onwards;

Holding Classes on Energy and Environmental Conservation and Waste Management to various groups like **Farmers, Students, Housewives, Resident Welfare Associations, Kudumbasree Unit Members**, for the last 20 years;

About Family:

Wife: Ms. Reeba Varkey B.Sc., M.A., B.Ed., Former Member, Kerala State Social Welfare Board [Nominated by the National Social Welfare Board]; **Former Chairperson**, Kottayam Municipal Council (October 2005 – July 2009)

Daughter: Ms. Anju Sara Sabin, M.SW., M.Phil; Senior Social Welfare Officer, Melbourn, Australa.

Son: Er. Appu Mathew Varkey, M.Tech; Principal Engineer, Global Foundries, Singapore

PROFILE OF STARTUP

PENTOREUM INNOVATIONS PRIVATE LIMITED

CIN: U73200KL2017PTC049712, Date of Incorporation: 11th July 2017

CEO: Prof. Varkey Mathew [DIN: 07857144]

Director: Mr. Alexander Samuel Thomas MBA [DIN: 0312609]

Objectives:

To conduct Research and studies to manufacture Environment-friendly products using waste materials (Biomass) or invasive weeds, like Water hyacinth etc.;

To design and develop machinery for establishing manufacturing units for the production of such value added materials;

To make use of wastes/weeds that would be generating green house gases like methane, carbon dioxide hydrogen sulfide, etc.;

To do innovative studies to develop new technologies to FIX carbon so that environmental pollution is avoided; and

To establish such manufacturing units in Developing countries, that are mainly in the Tropical region, where the raw materials are available in larger quantities, so that the local people get better and more job opportunities, from collection and transportation of raw materials, processing, etc., to final delivery to distant destinations.

Innovative Technologies/Processes that can be made use of in the Proposed Manufacturing units:

a) India Patent No. 314150; Patentee: Prof. Varkey Mathew

“Particle Board made of Cellulose nanofibre prepared from Water hyacinth”.

The main innovation is the Process for preparing ‘Fibrillated cellulose’ from the weed, which provides a RESIN that can be used for manufacturing particle board, MDF, etc. The Resin thus generated is **FREE of formaldehyde** which is a CARCINOGEN that is part of the existing Urea-formaldehyde and Phenol formaldehyde resins in use (almost in 90% of boards, etc.); the Resin, “Poly-fibrillated cellulose” contains **ONLY**

CELLULOSE, AND ANY PRODUCT WILL NOT GENERATE CARCINOGENIC OR OTHERWISE HARMFUL GASES.

b) **India Patent No. 244800; Patentee: Prof. Varkey Mathew et. al.**

“Process for manufacturing Polymeric material of Cellulose nanofibre from wastes of Plantain and Banana plants”.

This innovation can be applied for the manufacture of many medically important products, like bandage, prosthetics, helmets, etc., making use of the farm wastes of banana, plantain, etc.

Preference for Water hyacinth weed harvesting and processing

The need for using Water hyacinth for manufacturing “Poly-fibrillated cellulose” Resin and thereby to manufacture particle board, etc. [Patent No. 314150]

Tens of thousands of hectares of water bodies in the Tropical and subtropical countries are suffering from the “Water hyacinth Carpets”. As a consequence of the thick covering, fishing, water transport for goods and people, tourism, etc., are heavily hindered and as a result millions are thrown into utter poverty worldwide. Application of this Patented Technology can become highly relieving to the hardships of the people in all these countries.

The Benefits

The weed plants as a whole (including leaves, roots and stem) can be collected, thereby eliminating pollution to a good extent;

Large bulks (hundreds of tons per day) can be collected using ‘Harvesters’ and processed to generate the Resin;

Manufacturing units can be installed in locations where there is a large quantity available, like, few hundred hectares filled with carpets (usually 300 to 500 tons of weed would be present in one hectare); and

The Resin can be used for manufacturing products of different Composites, as done with formaldehyde resins, as well as other forms like tiles, boards, etc.
