

DETAILS ABOUT 'CENTRE FOR ONE HEALTH' AT RKMVERI

Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), a deemed to be University declared by the Government of India under the University Grants Commission (UGC) Act, 1956, in the hallowed names of Sri Ramakrishna and Swami Vivekananda has taken the initiative to set up a 'Centre for One Health' which is being widely discussed in the recent times, particularly post-Covid 19 global pandemic. The World Health Organization (WHO) of UNO and ICMR (Indian Council of Medical Research) of Government of India, are seriously seized of this issue of 'One Health' which is an integrated approach to health comprising Soil-Plant-Animal-Human (SPA) health issues in a holistic manner. The intention is to promote unified, integral, soil-plant-animal-human health. RKMVERI has set up a 'Centre for One Health' whose detailed roadmap and the work done so far during the period Dec 2022—Dec 2023 is delineated below.

1. The 'One Health' Initiative proposed to be undertaken by RKMVERI

RKMVERI's vision is a harmonious combination of the ancient Bharatiya Jnana Parampara (Indian Knowledge Systems Tradition) with the modern scientific knowledge as envisioned by Swami Vivekananda who gave us the following mandate: "Rooted in the Prachin Bharatiya Jnana Parampara (Ancient Indian Knowledge Traditon) and blending it harmoniously with the modern scientific knowledge, we should establish a University at Belur Math [under Ramakrishna Mission]". The 'One Health' initiative is one such integrated approach (rooted in the elaborate discussions and directives as found in Kautilya magnus opus, Arthashastra) blended with the modern soil-plant-animal-human health sciences. This 'Centre for One Health' is thus an inter-disciplinary Centre with three basic components: (i) research, (ii) teaching, (iii) extension/outreach/training programmes in 'One Health'. We envisage the creation of a large dedicated pool of 'One Health' workers well trained in the theretical and practical aspects of this emerging subject to promote unified, integral, healthy soil-plant-animal-human-society nexus. The 'One Health' concept is grounded on the assumption that the health of animals, people, plants, and the environment is interconnected and implies their integrated management to tackle health threats and promote holistic health of the entire environment with all its various components. [See the write-up enclosed herewith titled "The 'One Health' Concept—Its roots in the ancient Indian Wisdom"]. With substantial experience and expertise in agricultural sciences and rural development, the vibrant Departments of 'Agriculture and Integrated Rural and Tribal Development and Management' at the Narendrapur and Ranchi 'Off-Campus' Centres of RKMVERI deemed to be University together with the two Krishi Vigyan Kendras (KVKs) under the University hopes to achieve this projected goal. The 'Medical Biotechnology Division' at the Narendrapur 'Off-Campus' of the University will provided great support in this new venture. In line with

the Food and Agricultural Organization of the United Nations' approach (<https://www.fao.org/one-health/en/>), the 'One Health' Initiative at RKMVERI may work on food security, sustainable agriculture, food safety, antimicrobial resistance, nutrition, plant, animal and human health, fisheries, and livelihoods. Such a transdisciplinary approach covering multiple sectors will need to generate critical knowledge on inter-sectoral interfaces (e.g., animal health and human health). The proposed 'One Health' Initiative will generate such knowledge, employ them to design multi-sectoral agri-food-health systems that work on the ground, and field test those solutions for contextual refinement. The generated knowledge, systems design, and experience of community-level interventions will form the basis of developing teaching-learning resources and best practices, which will be used for university teaching, policy advocacy, and public outreach. Experts from diverse academic and professional backgrounds met at Belur Math on 5 December 2021 (members of the task force is provided in the list below) to discuss the possibility of initiating 'One Health' at RKMVERI. A 20-member Task Force (see the list attached) was formed, with 5 more co-opted later, drawing experts from the various fields related to 'one health' to work out the detailed roadmap in this regard. Some of the active collaborators in this initiative, to mentioned a few are: African Plant Nutrition Institute represented by Dr. Kaushik Majumdar, the Director-General of this Institute (<https://www.apni.net/team/kaushik-majumdar/>), and Girijana Kalyana Kendra & Karuna Trust, represented by Dr. H. Sudarshan, Secretary, Vivekananda Girijana Kalyan Kendra (https://en.wikipedia.org/wiki/Hanumappa_Sudarshan).

2. 'One Health' Initiative under the auspices of Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI) in collaboration with Vivekananda Girijana Kalyan Kendra (VGKK)

TASK FORCE (formed at a meeting held on 5 December 2021 at the Belur Main Campus of RKMVERI)

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|-----|---------------------------------|--------------------------------------|
| 1. | Swami Atmapriyananda (Chairman) | Physics (Administrative Facilitator) |
| 2. | Swami Shivapurnananda | Agricultural Biotechnology |
| 3. | Dr. S. Ayyappan | Agricultural Sciences |
| 4. | Dr. Prabodh Dhar Chakraborty | Disaster Management |
| 5. | Dr. Kaushik Majumdar | Soil Science |
| 6. | Dr. Sudarshan Dutta | Soil Science |
| 7. | Dr. H. Sudarshan | Medical Sciences |
| 8. | Dr. Gour Das | Medical Sciences |
| 9. | Dr. P. K. Nag | Occupational Health |
| 10. | Dr. Rupak Goswami | Rural Development |
| 11. | Dr. Gautam Chatterjee | Agricultural Biotechnology |

12.	Dr. Chandan Ghosh	Disaster Management
13.	Dr. Debasis Banerjee	Medical Sciences
14.	Dr. Kajal Sengupta	Agronomy
15.	Dr. Abhijit Chakrabarti	Biochemistry
16.	Dr. N. C. Sahu	Soil Science
17.	Dr. Ashwin Laxmikant Kotnis	Biochemistry
18.	Dr. Sarbaswarup Ghosh	Veterinary Sciences
19.	Dr. Swagat Ghosh	Fisheries Science
20.	Dr. Krishnendu Ray	Agronomy
21.	Dr. Paromita Roy	Philosophy (Environmental Ethics)
22.	Dr. K. Aguan	Molecular/Cell Biology, Neuro-genetics
23.	Dr Nachiketa Chattopadhyay	Econometrics, Statistics
24.	Dr Debasis Sengupta	Statistics
25.	Sreeraj Roy	Pharmaceuticals (Strategy & Business)

3. Write-up on 'One Health' Health—its roots in the Ancient Indian Wisdom

3.1. How did the concept of 'One Health' originate?

'One Health' is in fact a collaborative, multi-disciplinary approach aiming at optimal health outcomes by recognizing the interconnection between plants, animals as well as humans and their shared environment. The term 'One Health' was first used in 2003-2004 and was associated with the emergence of severe respiratory disease (SARS) in early 2003 followed by the spread of highly pathogenic avian influenza H5N1 which led to evolving of strategies specifically known as 'Manhattan Principles' listing 12 recommendations in Wild Life Conservation Society (WCS) meeting held in Sept 2004 to trace the roots of epidemic diseases and thereby fight the crisis with an understanding of ecological integrity which speaks of a holistic approach toward environment.

Interestingly, but not surprisingly, the idea of 'One Health' that is fast gaining acceptance in the modern idea of 'integral health' or 'convergence' as it used to be called, has its roots in the ancient Indian thought. 'Oneness' has been the key concept cultivated and emphasized in the ancient Indian wisdom of the Vedas and the Vedanta—in the Upanishads we find repeated references to *ekatva vijnana*, (the Knowledge of Oneness). Although appearing anew on global platform reincarnating as it were in a new form, this idea of 'Oneness' is the bedrock upon which the ancient Indian edifice of philosophical, spiritual and scientific thought was based. It is wonderful to see how the Indian thought current has been silently transforming the thought current of the world. In Swami Vivekananda's inimitable poetic words: "Like the gentle dew that falls unseen and unheard, and yet brings into blossom the fairest of roses, has been the contribution of India to the thought of the world. Silent, unperceived, yet omnipotent in its effect, it has revolutionized the thought of the world."

India has always nurtured in her bosom the ideas of 'unification', 'integration',

'harmony and synthesis' leading to One Unified State of Existence, wherein the scientific, philosophical and spiritual ideas of 'interconnectedness' and 'interdependence' lead in practice to collective and universal well being, because the well being of the individual is intimately related to the well being of the collective—one is all: the microcosm-macrocosm is one Indivisible Whole.

3.2. One World, One Health in the Vedas

The idea of nature deification in the Vedic age reveals how men realized the interconnection with each component of nature. Through the process of deifying nature, Vedic men expressed gratitude toward the nature in its entirety which maintains their survival. Men therefore considered themselves only as part of the entire causal nexus of events which is characterized by symmetry. Each of the parts has its roots in the Greater Whole from which they originate and such is true of all events and phenomena which Vedic Rishis deified 'ekam sadviprā bahudhā vadanti...' (Rg Veda 1.164.46) or 'ekam santam bahudhā kalpayanti..' (Rg Veda 10.114.5): "That which exists is One, the sages call it differently", "That being One, is imagined to be many".

3.3 One World--One Health in the Upaniṣads

The Upaniṣads explain how One World has originated from the Supreme Reality. To quote a verse from the Taittirīya Upaniṣad:

tasmādvā etasmādātman ākāśaḥ sambhūtaḥ /
ākāśadvāyuḥ / vāyoragniḥ / agnerāpaḥ /
adbhyaḥ pṛthivī /
pṛthivyā ośadhayaḥ /
ośadhībhyo'nnam /
annātpurūṣaḥ / (Tai UpII.i.1)

From that Brahman indeed, which is this Self, was produced space.
From Space emerged air. From air was born fire. From fire was created
water. From water sprang up earth. From earth were born the herbs.
From the herbs was produced food. From food was born man.¹

The world with all its elements (living and non-living) having their locus in the Supreme Being advocate a wonderful accord that runs through them. Any harm done to any of the elements would eventually inflict harm on the other as all are interrelated in this Cosmic Whole.

3.4. One World--One Health in Arthaśāstra, Manusmṛiti and Yājñavalkyasmṛiti

Though being a book on the science of polity, Arthaśāstra did not overlook nature's well-being. It was believed that economic gains can be ensured only when all aspects of nature are well taken care of. The king had the moral obligation to protect the bounty of nature. We notice not only strict vigilance of the Superintendent of Agriculture for optimal land usage, homage to land for better productivity and human sustenance is also visible in the Arthaśāstra. Thus goes the following verse:

prajāpataye kāśyapāya devāya ca namaḥ sadā /
sītā me ṛdhyatām devī bījeṣu ca dhaneṣu ca // ²

Every time crops were sown in any particular time of year, a handful of seeds soaked in a pot of water with a piece of gold had to be sown chanting the above mantra whereby homage is paid to God Prajapati, Kaśyapa (son of Sūrya). It is prayed so that agriculture may prosper and the Goddess (Sītā Devī) may bestow her blessings.

Apart from land care, Arthaśāstra also mentions the presence of the Superintendent of Forest, Superintendent of Domestic Animals ensuring the well-being of the biotic community. Arthaśāstra also lays down extensive measures for wasteland management. The statecraft in Arthaśāstra clearly reveals that everything in nature is intertwined and therefore to ensure economic gains the king had to look into every sector of nature.

The idea of Pañcamahāyajña in the Manusāhitā projects the moral responsibility of an individual to protect nature. He realizes that he is nurtured by nature and therefore in the Gārhasthya stage of life an individual is found to execute his moral duties towards the entire world. Thus goes the verse:

adhyāpanam brahmajñam pitṛyajñastu tarpanam /
homo daivo balirbhauto nṛyajñohatithipūjanam // ³

Teaching and studying is the sacrifice offered to the Brahmanas. The Pitṛ R̥ṇa is the obligation that the moral agent owes to his ancestors so that human race may survive and grow. This he discharges by paying respect to the ancestors by performing funeral rites and other ceremonies. The Deva R̥ṇa is the obligation that the householder owes to the entire universe. This he discharges by pouring oblations in the fire. The Bhuta R̥ṇa is the obligation that the moral agent owes to the lower animals. This he discharges by giving food and protecting them.

The householder is also indebted to his neighbours and other beings which is the *Nṛ Rṇa*. This he discharges by serving and entertaining guests.

The idea behind *Pañcamahāyajña* is One World--One Family where the well-being of one is intertwined with the well-being of the other. The *Yājñavalkyasamhitā* also projects individual commitment towards the entire world in the following verse:

balikarmasvadhāhomasvādhyāyātithisatkriyāḥ /
bhūtapitramarabrahmanuṣyāṇām mahāyajñāḥ // (1/102)

Sacrifice of animals (Bali), oblation or food offered to the manes (Svadhā), oblation of Fire (Homa), study and teaching of the Vedas (Svādhyāya), and the reception of guests, are the great sacrifices of the Bhūtas (evil spirits), Pitr-s (departed manes), Devas (celestials), Brahmā, and Manuṣya (mankind).⁴

The discharge of duties by an individual householder is indeed a way to honor the entire creation of which he is a part. This significantly undermines the prospect of any sort of human dominion and lordship over nature. Man discharges his responsibilities as a citizen of this world. This creates a strong sense of bonding between man and nature that eventually paves the way to the development of an eco-community.

3.5. How is the idea of eco-community significant to ensure 'One Health'?

The ancient Indian perspective towards nature is extremely necessary to ensure well-being of the entire community of nature. It is not divided state of existence but living in harmony with nature that can help in developing better health infrastructure where the life of one is not sacrificed for the enjoyment and benefit of humans. It is the intrinsic value of nature and not its instrumental value that is needed to be realized by in this hour of crisis.

Aldo Leopold (1887-1948), the most influential figure in the development of an eco-centric environmental ethics in an essay in 'A Sand County Almanac' says "Land then is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals." He writes further "the land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively the land." He uses the idea of a "biotic pyramid" or "land pyramid" to help us understand the nature of biotic community. The concept of eco-centric ethics is taken further by the Norwegian philosopher, Arne Naess in his concept of an 'Ecological Self'. The concept of Deep Ecological sense of the Self requires a greater

maturity on the part of a human whereby he can identify himself with the non-human realm of nature. Such an understanding helps and individual to transcend the concept of any isolated ego that insists on the development of a person as a separate individual. This is exactly what our Indian tradition has silently upheld millennia upon millennia.

In the modern age, Swami Vivekananda, following his Master, Sri Ramakrishna, revived at the philosophical, scientific and spiritual levels, the ideas of the ancient system of Vedanta:

- (1) Innate, inherent Divinity of every individual being,
- (2) Oneness or Unity of All Existence (Solidarity of the Universe) through the discovery of Microcosm-Macrocosm Identity,
- (3) Thus leading to Divinity of All Existence.

Romain Rolland therefore rightly said: "In the two words, equilibrium and synthesis, Vivekananda's constructive genius may be summed up. ...He was the embodiment of the harmony of all human energy."

A fitting finale to this short write-up is the following Shanti Mantra (Peace Chant) that invokes in telling language peace and benediction, and therefore joy and happiness (for there can be no joy without peace as the Bhagavad-Gita says: "Ashantasya kutah sukham"—Gita, 2.66) on the entire gamut of existence: the sky, interstellar space, the earth, the waters (rivers and oceans), the plants and the herbs, trees and the environment, all the forces of Nature, in fine, ALL of creation—may supreme peace pervade, envelop and interpenetrate the entire universe.

द्यौः शान्तिरन्तरिक्षं शान्तिः पृथिवी शान्तीरापः शान्तिरोषधयः शान्तिः।
वनस्पतयः शान्तिर्विश्व देवाः शान्तिब्रह्म शान्तिः सर्वं शान्तिः शान्तिरेव शान्तिः सा मा शान्तिरेधि॥
(शुक्ल यजुर्वेद ३६-१७)

Om. Dyauh shantih, antariksham shantih, prithvi shantih, aapah shantih, oshadhayah shantih, vanaspatayah shantih, vishve devaah shantih, brahma shantih, sarvam shantih, shantireva shantih, saa maa shantiredhi.
Om shantih, shantih, shantih.

English Translation of the above Mantra:

Om. May peace prevail in the heavens (the sky). May peace prevail in the interstellar space. May peace reign on the earth. May the waters be peaceful. May peace be on all the plants and herbs. May peace reign on all the trees and environment. May peace rest with all the divine beings. May the Supreme Being and the scripture be the Abode

of Supreme Peace. May peace reign everywhere and in every being. May there be peace and more peace everywhere at all times. May that supreme peace come to me too [by the grace of the Supreme]. Om peace, peace, peace!

References:

1. Swāmī Gambhīrānanda (translated) Eight Upanisads (Volume one), Advaita Ashrama 2006, pp-304
2. Bandopadhyay Manabendu: "Kauṭilyam Arthaśāstram" (edited and translated) Bengali, Sanskrit Pustak Bhandar, 1st vol & 2nd vol 2002 & 2001 respectively, verse 2.24.10.
3. Bandopadhyaya Sureshchandra (translated) Bengali, "Manusamhita", Ananda Publishers Pvt. Ltd.1999, verse 3.70.
4. K. L. Joshi (Edited and revised), Manmatha Nath Dutta (translated), Yajñavalkyasmṛiti, Sanskrit Text, (English Translation, Notes, Introduction and Index verses), Parimal Publications, 2005, pp-26-27, verse-102

4. Education & Training Programs: Certificate Course on 'One Health' IRDM401: Introduction to 'One Health' (2 credits)

Course Objectives:

The objective of this introductory course is to appreciate & explore how humans, plants, animals, and the environment are all inter-connected through the lens of the concept of One Health. The course shall make the students across the disciplines, aware of the concept by combining traditional wisdom with modern sciences.

Syllabus: (32 lecture hours)

Module 1: Philosophical & Cultural aspects of One Health (2 Lectures) Dr. Paromita Roy

A philosophical, spiritual and aesthetic view, emergence of One Health concept, interdependence of Human, Plant, Animal, and Environmental health – An overview

Module 2: Planetary Health (4 L) Dr. Prabodh Dhar Chakrabarti

Climate change, deforestation, loss of biodiversity, ocean acidification, phosphorus and nitrogen cycle, their impacts on human, animal and plant health

Module 3: Environmental Health (4 L) Dr. Chandan Ghosh

One Environment – air, water, and soil, air health – pollution, ozone depletion, carbon cycle, fossil burning, and GHG emission; Water Health – supply source, sanitation,

contamination, transmission of waterborne infections and diseases; Soil Health – micro-nutrients and biological properties, soil micro- and macro-fauna, pesticides contamination; implications on environmental health, transmission of infections and disease

Module 4: Plant Health (4 L) Dr. Kajol Sengupta

Evolutionary relationships across different forms of life, traditional and organic versus modern farming: impacts on soil, plant, animal, and human health; agricultural systems, agronomic practices, modern mechanization on plant health; plant-microbiome network; food sources and nutrition

- 1) Introduction [Importance of Plant Health in 'One Health - human and animal health are closely connected to plant health for at least following reasons:
 - (i) Food security, (ii) Food safety, (iii) Feed security and (iv) Livelihoods.
- 2) Traditional and organic versus conventional or modern farming- Merits of Organic farming.
- 3) Agronomic practices – Bad practices vs. Good practices; Importance of soil health; Sustainable crop management - The nexus between plant and plant microbiome and its importance in plant health
- 4) Food sources, their quality and nutritional value.

Module 5: Animal Health (4 L) Dr. Sarbaswarup Ghosh

Human-Animal relationship and welfare, Human-Wildlife coexistence, increasing incidents of conflicts, impact in the rural economy, conservation efforts; aquatic animal health (Disease monitoring, Surveillance, Epidemiology, Quarantine, Certification, Import risk analysis.), animal food sources and nutrition; Soil health → Animal feed → Animal health → Animal food quality; Strategic dietary supplements in animals and aquatics; Defining and understanding emerging zoonotic disease, antimicrobial and anti-helminthic resistance.

For Aquatic animal- Application Good Manufacturing Practice (GMP), Good Hygiene Practice (GHP), Hazard Analysis and Critical Control Point (HACCP)-programme, Probiotics and bioremedial measures; Immuno-stimulants and their role.

Module 6: Human Community Health (4 L) Dr. H Sudarshan

Physical health – The foundation, Mental and behavioural health – benefits of human-plant, and human-animal interactions; Cultural health – the strength and protection; Communicable and non-communicable diseases; Antimicrobial resistance (AMR); Lessons learned from COVID-19 outbreaks; Emerging zoonotic disease threats.

Module 7: Eco Health (2 L) Dr. Gautam Chatterjee & Colleagues

One Earth, One Ecosystem, One Health; Nutrient recycling and nutrient flow in the Ecosystem, Biodiversity and its role in ecosystem health

Module 8: Management of Epidemics & Pandemics (2 L) Dr. Prabodh Dhar Chakrabarti / Dr. Anindya Mukherjee

Extreme events and the resulting influences on One Health; Emerging threats, perspective, prediction and risk management

Module 9: Socio-economic aspects of One Health (4 L) Dr. Rupak Goswami

Social and cultural aspects of human-animal interactions; Reflective and Participatory Social Science for One Health – Concepts and Reported Cases; One Health Economics – Concepts, Reported Evidences, Examples of Economic Analyses used in One Health; Linking One Health to Sustainable Livelihoods

Module 10: Emerging Policy & Institutional Framework (2 L) Dr. Prabodh Dhar Chakrabarti

One Health in policy development, One Health in action and practice, Academic and Institutional One Health program; The nature of One Health study – concepts and examples from Zoonoses, antimicrobial resistance, surveillance systems, etc.; The concept of complex systems, defining systems and systems boundary, sampling, design considerations, analysis plans, and ethical considerations.

5. Booklet under preparation under the 'Centre for One Health'

'One Health'—the Philosophy and Practice from the perspectives of Ancient Indian Wisdom and Modern Global Trends of Thought

by

Dr Paromita Roy

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4.1.1. Rg Veda and the Yajur Vedatraditions

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Chapter 5. Tribal Traditions and Culture: Holistic vision towards Nature among the indigenous people

Chapter 6. Whither next: Future Hope in Healing the Earth

Contents in detail for the above book have already been prepared, running to nearly 100 pages. Each of the topics will lead further elaboration and detailed referencing. This is under preparation and the whole book (running to about 250 pages), capturing both the ancient Bharatiya Wisdom tradition and the modern scientific knowledge about 'one health' is expected to be published within one year (2024-2025).

Physical infrastructure for 'Centre for One Health'—three-storeyed building at RKMVERI's Narendrapur 'Off-Campus' Centre's 'Sasya Shyamala' Krishi Vigyan Kendra (KVK) is almost already—some additions and finishing touches are pending and the work is getting delayed for want of funds. The entire building is expected to be ready and functional within a year (2024-2025).