



ASIA — PACIFIC “4 PER 1000” REGIONAL MEETING

KANHA SHANTI VANAM

INDIA

19 TO 22 SEPTEMBER 2023



heartfulness
advancing in love



DAY 1

The conference officially started on September 19 with an evening reception, during which, the participants had the opportunity to get to know each other, socialize, network and exchange ideas in a relaxed atmosphere.



DAY 2

INAUGURATION

Ms. Eva Vandest (Heartfulness Institute) opened the first session of the conference by reflecting on the creation of Khana Shanti Vanam and providing some insight about the reason why of the conference. She also thanked all the parties involved in the organization of the conference. The inauguration of the session was then continued by **Dr Paul Luu** (Executive Secretary of "4 per 1000") who expressed the gratitude of the "4 per 1000" Presidency to Heartfulness Institute. Due to the absence of Dr Ibrahim Mayaki (Vice-President of "4 per 1000"), Dr Luu was nominated the chairman of the conference.



Following this introduction, the inauguration commenced with speeches by several representatives from governmental, scientific and other institutions. Starting off, **Hon. Sakiasi Raisevu Ditoka** (Minister for Rural, Maritime Development & Disaster Management of Fiji) described the heavy impact of climate change on the Fiji Islands. He focused especially on the threat of rising sea levels for the coastal communities of the Fiji Islands (increase of soil erosion, nutrient loss, freshwater contamination, susceptibility towards disasters). He underlined the importance of sustainable soil management as a way to counteract the impacts of climate change. Closing his speech Minister Ditoka expressed his gratitude towards the "4 per 1000" Initiative for their work and the organization of the conference.



Mr. Thierry Berthelot (Consul General of France in Bangalore - India) expressed the French Government's thanks towards the organizers of the Conference. He highlighted India's important role regarding the promotion of Soil Health. He further expressed his hope that India will join the efforts of the "4 per 1000" Initiative and extended an invitation towards India and other members of the Asia-Pacific Region to attend the "4 per 1000" Day (December 5) during COP28 in Dubai and to join the "4 per 1000" Initiative as member. He also spoke of mobilizing partners for COP28 in order to create a more coherent calendar about soil, agriculture, food systems, etc.



Next, **Shri Singireddy Nirrajan Reddy** (Hon. Minister for Agriculture of Telangana - India) took the floor. He affirmed the necessity of soil conservation and regeneration in light of the importance of soil for food production and climate. Furthermore, he highlighted the importance of promoting sustainable agricultural practices and knowledge transfer between scientists and farmers.

Shri Raghunandan Rao (Secretary of the Agriculture Cooperation Department of Telangana - India) praised the work conducted in Telangana over the last few years in order to promote soil health. He pointed out that a neglect of agriculture will ultimately have negative consequences for other sectors of the economy as well and that this realization caused a change of mindset towards soil management in Telangana. He continued to describe several exploits and investments of the government of Telangana in this area (soil health, food systems) such as the 4-year lift irrigation project "Kaleshwaram" and the connected growth of green cover and improvement of rural livelihood, etc. (fish and milk production were also increased). Key for this success was the cooperation with local communities.

The importance of soil health, as the basis of food security and climate adaptation and mitigation was further supported by **Ms. Ingeborg Bayer** (Counsellor Food and Agriculture, German Embassy, India). She also mentioned the recently proposed EU Soil Health Monitoring Law and shortly introduced the German Humus program and some of the GIZ's activities in India surrounding soil.

Following, **Hon. Kamlesh D. Patel**, commonly known as **Daaji** (Global Guide of Heartfulness - India) stressed the importance of teaching people about sustainable management practices. He also asked the audience to consider the environmental impact of, not only trees but of other types of plants as well. After his speech a short presentation of the "4 per 1000" Initiative book on soil health and agroecology followed.

Mr. Khun Chayaditt Hutauwatra (Advisory to the Ministry of Interior - Thailand) gave an overview of the situation in Thailand and the changes in climate that they are currently facing. He highlighted the chemical pollution of agricultural soil due to heavy fertilizers and agrochemicals use. He described the efforts of the Thailand government to promote de-urbanization by making the life on a farm more attractive to young people. There is a need to change the mind set of people: Organic agriculture works both as a mean to secure soil health and sufficient livelihood. Food needs to come from a living and healthy soil.



Mr. Takayuki Hagiwara (United-Nations Food and Agriculture Organization Representative - India) pointed out the significant relevance of soil health for the region of Asia in light of the fact that the livelihoods of millions of people depend on agriculture. About half of the people threatened by food insecurity worldwide are located in Asia. Mr. Hagiwara affirmed the FAO's efforts in promoting soil health and food security and their willingness to cooperate with others in order to achieve their framework's objectives.

Next up, **Dr Shalander Kumar** (Deputy Global Research Program Director, ICRISAT - India) spoke about the current significance of tenant farming and the need for long-term investment in soil health, innovation and research. Furthermore, he argued that in order to create incentives for farm practices that are carbon friendly, the ecosystem services provided by these practices need to be monetized. For this purpose, ICRISAT is involved in the promotion of MRV (Measuring, Reporting and Verification) systems and the evaluation of ecosystem services. A mechanism is needed to incentivize individual farmers who use sustainable practices. Kumar also highlighted the importance of awareness raising and, how are informed consumers about the way food are produced.

Mr. Shamik Trehan (CEO, Dr. Reddy's Foundation - India) drew attention to the hardships connected to soil degradation that smallholder farmers in India are facing (most of them have an income between only 7,000-8,000 rupees a month – 85 to 100 US\$) and highlighted the need for collaboration of the various stakeholder groups and the transfer of knowledge in order to spread sustainable practices among smallholder farmers.



Mr. Anil Kumar (Founder & CEO, Sammunati Financial Intermediation and Services Private Limited - India) defined the three most important aspects when engaging farmers about sustainable practices as awareness, accessibility, and affordability.

The inauguration was concluded by **Dr Luu** ("4 per 1000") who expressed his gratitude to the supporters and partners of the conference.

KEYNOTE SPEECHES

The keynote session opened with a video presentation by **Professor Rattan Lal** (Distinguished University professor at Ohio State University – USA) who outlined the functionalities and benefits of soil organic matter sequestration. Professor Lal also recommended a set of sustainable practices that should be implemented in order to adapt India's agriculture to meet the challenges caused by a growing population and climate change:

- Adopt no-till farming/Conservation Agriculture
- Promote Integrated Nutrient Management (INM)
- Avoid in-field burning of crop residues
- Replace traditional cooking-fuel by modern fuel
- Replace flood irrigation by drip system irrigation (micro-irrigation)
- Restore degraded/decertified soil and ecosystems
- Eliminate scalping of surface soil for brick making
- Create rental facilities for sower and tractor

He also introduced nature positive soil/agronomic practices, including:

- Protecting, managing and restoring soil
- Re-carbonizing soil and vegetation
- Improving water quality and renewability
- Adopting negative emission farming
- Reducing input of chemicals
- Using bio-stimulants and organic-amendments
- Promoting a bio-circular economy
- Supporting the "One health" concept
- Using digital innovations
- Rewarding farmers for ecosystem services
- Promoting education about soil and environment

Professor Lal also spoke about the concept of carbon farming as a new way of income for farmers. He stressed the necessity to support farmers switching from conventional to conservation agriculture. He also outlined SDGs (United-Nations Sustainable Development Goals) related to soil health for India that need to be achieved until 2030:

- End hunger
- Climate action
- Life on land
- End poverty
- Good health
- Clean water
- Renewable energy

Professor Lal also highlighted the important role of cooperation with the private sector for translating science into action by promoting nature positive agriculture, increasing access to inputs and improving investment in agricultural research and development. Finally, Professor Lal introduced the concept for a soil-centric program to promote soil health including conservation agriculture, Integrated Pest Management (IPM), Integrated Nutrient Management (INM), Subsurface drip irrigation (DSI), crop residue management, cover cropping & crop diversification and payments for ecosystem services, enabled by governance and political willpower.



Dr Ananya S. Rao (Senior Scientist, Forests by Heartfulness, Heartfulness Institute & UNESCO MGIEP - India) presented the global situation of soil health and the most promising advances in this area. She explained the interlinkages between soil health and soil carbon. Worldwide the soil organic matter content of soil in croplands decreases. A model projection for India showed that an increase of up to 4% soil organic carbon is possible if there are no anthropogenic interventions. Comparing different land uses, it becomes clear that converting from cropland to grassland or to forest land increases soil organic matter (SOM) while a conversion in the opposite direction will decrease SOM.

She also provided a set of mechanisms (no-till, cover crops, agroforestry etc.) and policies (carbon farming programs, carbon markets, soil health standards etc.) to improve soil health. She also highlighted the Great Green Wall project in Africa and the KISME framework (UNESCO).

Dr Marcos Angelini (Data Scientist, Global Soil Partnership (GSP), FAO) presented FAO-GSP's Capacity development Program. He began by giving some background information about GSP, its origin, purpose and its current activities. GSP is providing training workshops and works with more than 14,000 national experts. GSP is active in 127 countries, and GSP works closely with the Asian Food & Agriculture Cooperation Initiative (AFACI) and the Rural Development Administration of Korea. The AFACI-Soil Project aims at producing soil data on a national level (either collecting data for the first time or updating old data). Among other things, this resulted in the Soil Atlas of Asia (FAO). The national actors are taught how to develop soil property maps following the GSP standard. Another product was the series EduSoils (video courses). The GSP was also successful in improving the soil databases of all the participating countries. Success was the establishment of a regional network and the capacity development including in-person training on digital soil mapping. Overall, the AFACI-Project was deemed a success and has already been extended for three more years. Angelini's presentation was complemented by a short video (FAO) advertising about the project.

Dr V. Ramakantha (Former Principal Chief Conserver of Forests, Indian Forest Service (Retd), Forests by Heartfulness, Leader of the Heartfulness Green Initiative, Heartfulness Institute - India) presented the achievements of Heartfulness, in Khana Shanti Vanam, since 2015. He addressed the water conservation by Blue Khana Institute, the creation of food forests, millet farms, several gardens (vegetables, edible wild plants, medical plants), and tree clusters.



Heartfulness has also established a great nursery for native tree species. They have translocated trees that otherwise would have been disposed of. Most plant species (indigenous) that are used in Khana Shanti Vanam provide a certain value (ecological, food, medical etc.). Dr Ramakantha also explained, in more details, how the rainforest for Khana Shanti Vanam has been created. Among the used tree species, several are critically endangered. The methods used by Heartfulness in their projects are the subject of a 5-month internship of Mr. Louis Dreyfus subsidized by the Heartfulness Foundation.

Dr Ramakantha's presentation concluded the Keynote speech segment and the first part of the session.

THE CONTEXT IN THE ASIA-PACIFIC REGION

The second part of the day begun with a segment on the situation of soil health in the Asia Pacific Region. The first presentation by **Dr Paul Luu** ("4 per 1000") provided an overview of the current status of the "4 per 1000" Initiative. Dr Luu started off by unveiling three general types of action to fight climate change and food insecurity and to increase biodiversity:

- 1) Conservation and protection of remaining natural habitats including hotspots in biodiversity and carbon rich soil ecosystems (peatland, permafrost, etc..)
- 2) Ecosystem restoration (global priority areas with greatest potential for organic carbon sequestration and biodiversity increase)
- 3) Change of agricultural paradigm and practices through agroecology on priority areas with high carbon sequestration potential, but not only.

Dr Luu then continued by shortly outlining the benefits of healthy soils and the resulting necessity of carbon sequestration. He pointed out that methods to promote carbon sequestration already exist. Furthermore, Dr Luu described the future trend towards agroecology. Moving on, Dr Luu showcased several sustainable farming systems. Dr Luu also affirmed the important role of farmers and the linkage between them and other stakeholder groups. Referring to a study conducted by CIRCASA it becomes clear that most farmers require information, advice, and support. Dr Luu proposed the development of a database that will provide farmers with information on potential applicable practices depending on their respective agro-pedo-climatic zone. The information would not only include an in-depth description of the adaptable practices, but also calculation of the economic results. Another idea involves providing farmers with information about the practices to be used in the field.

Mr. Hiroyuki Nishiura (Councillor, Ministry of Agriculture, Forest and Fisheries - Japan) described then, the activities surrounding soil health in Japan. He specifically highlighted the application of biochar and manure in Japanese agriculture which in turn is incentivized through a carbon credit scheme. The promotion of soil health is part of the MIDORI strategy (Strategy for Sustainable Food Systems, Midori meaning "green" in Japanese) to introduce more sustainable agriculture and food systems. Furthermore, Japan cooperates in promoting sustainable food systems with other countries in the Asian-Pacific region and also works closely with the FAO. Mr. Nishiura concluded his message with a remark on the necessity of a multi-layered and regionally adapted approach in order to promote soil health.

PRESENTATIONS OF NATIONAL SITUATIONS AND SOLUTIONS

Prof. Budiman Minasny (Soil-Landscape Modelling, University of Sydney - Australia) provided an overview of the current developments in soil carbon and soil health research in Asian countries. Most of the countries in Asia have pledged net zero targets, most of them between 2050 and 2060. The National Determined Contributions (NDC) of China, Japan, Nepal and Pakistan specifically include soil organic carbon as part of their strategies to reduce carbon emissions.

- 1) **China**: The improvement of carbon sequestration is included within the Five-Year Plan for National Economic and Social development and the Long-Range Objectives through the Year 2035, as well as within the "Action Plan for CO₂ peaking before 2030". The "Plan for Sci-tech Supporting Carbon Neutrality" promotes the innovation of technologies for monitoring, accounting and evaluation of emission, reduction. Finally, the Implementation plan for Carbon Emission and Sequestration in Agriculture and Rural Areas includes ten major actions, such as methane emission reduction in paddy fields, fertilizer reduction and efficiency and improving farmland C sink. Between the early 80s and the early 2000s, there was a slight increase in soil organic carbon in the topsoil. This can be attributed to an increase in production in the areas of paddy fields. However, there was also a decrease in soil pH due to the amplified use of fertilizers.
- 2) **Taiwan**: Soil carbon sequestration is part of "Taiwan's Pathway to Net-Zero Emissions in 2050" (National Development Council). The Ministry of Agriculture has invested \$10 million into soil carbon sequestration research and the "Taiwan Carbon Solution exchange" has been established as the office for carbon trading in Taiwan.

- 3) South Korea: The South Korean policy regarding sustainable agriculture also includes soil properties analysis service on a regular basis and data for fertilizer recommendations. It also offers incentives for farmers for sustainable and environmentally friendly food production. Since 2000 the soil carbon content of the topsoil has been observed on a 4-year basis. These observations have shown a slight increase of soil carbon content for plastic houses, orchards, paddy fields and uplands. The increase of soil carbon in paddies has also introduced an increase in methane emissions. Studies have shown that incorporating straw in the soil or applying biochar can reduce the emission of methane while maintain an increase of soil organic carbon content.
- 4) Indonesia: Between 2015 and 2018 there was an increase of rice, maize and soybean production resulting in an increase of methane emissions, fertilizer use etc. As a reaction to this development the Indonesian Government's NDCs include a low carbon and climate smart agriculture. This includes site-specific technologies, the reduction of Green House Gas (GHG) emissions, use of organic fertilizers, composting, biochar and low emission crops, and efficient water management and planting systems.

Overall soil carbon has gained more prominence as a mean to achieve Net Zero in Asia. It is necessary to upscale soil organic carbon sequestration efforts and to account for GHG emissions.

Dr Beverly Henry (Queensland University of Technology - Australia) described the situation regarding soil health and advances in research in the Pacific region. She primarily focused on three countries and regions:

- 1) New Zealand: New Zealand is characterized by high soil carbon stocks, due to a moist temperate climate and land cover dominated by perennial vegetation. There is, in fact, little potential for an increase of soil carbon sequestration. However, despite the high soil carbon stocks there has been a loss of ~3.3 t C/ha over the last 26 years due to land use change. Therefore the mapping, monitoring, and of course maintaining of SOC stocks is prioritized. As part of the national soil carbon benchmarking and monitoring, samplings at depths to 0.6 m (4-year rolling schedule) were conducted on about 500 sites (including all 5 main land use classes). This way changes of 2 t/ha could be detected.
- 2) Australia: Australian soils are ancient, low in organic matter and nutrients. Large parts of the continent have either low or highly variable rainfall. Soil health is highly vulnerable to European-style agriculture and climate change. The Australian National Strategy 2021 prioritizes soil health, aims to empower soil innovation and stewards and also aims to strengthen soil knowledge and capability. Since 2017, the Coordinated Research Center aims to provide farmers with the knowledge and tools to make decisions on complex soil management issues. Australia also included the concept of soil carbon in the NDCs and introduced a carbon credit scheme. Currently there are over 470 projects around soil carbon offset in progress.
- 3) Pacific Islands: Soil health has become an important issue in the Pacific Islands. Priorities in that regards include adaptation of soil health for food security, resilient farming, protecting ecosystem services, protecting livelihoods and MRV. The example of Maré Loyalty Island (New Caledonia) showed how high SOC stocks under traditional fire-fallow cultivation were reduced after switching to perennial orchards which stresses the importance of local traditional knowledge and adapting family farming systems to preserve soil health.

Within the Pacific region soil health is recognized as a key factor for both climate and food security. The example of New Zealand and Australia shows that, depending on the state of the soils in relation to the carbon content of the land, measures to conserve or build up soil carbon are a priority.

Mr. Nitesh Kumar (Lead of HHHI's Narmada Restoration program, Global Green Growth Institute - Republic of Korea) started the next part of the session. He gave a short overview of the GGGI which currently has 46 members and operates in 40 countries. Between 2015 and 2022 they were able to mobilize around \$8.6 billion of investments. Mr. Kumar presented the Narmada Landscape Restoration Project that GGGI is currently running in the state of Madhya Pradesh (India). The project involves the city Indore which is dependent of the water from the river Narmada. Unsustainable practices in agriculture and forestry in the surrounding communities have decreases water security and safety and also cause excessive erosion in the catchment watersheds. The project has two objectives:

- 1) Demonstrating the impact of sustainable landscape practices in agriculture and forestry on the water quality and quantity in selected tributaries of the river Narmada.
- 2) Establishment of a Payment for Ecosystem Services (PES) where catchment communities get incentives from Indore to continue using sustainable practices thus ensuring water security for Indore.

GGGI aims to restore 10,000 hectares of mixed landscape while reducing run of pollution by 20% and increasing water quality by 20%. Around 500 beneficiaries are meant to be trained and an 70% improvement in knowledge of ecosystem is expected. One of the main focus of the project is capacity building in the surrounding communities. Mr. Kumar emphasized the importance of giving to members of the participating communities', ownership of all the implemented interventions and providing them with incentives for their ecosystem services.

Dr Neha Jha (Soil Science Lecturer, School of Agriculture and Environment at Massey University, Auckland - New Zealand) emphasized that 49% of New Zealand's total annual GHG emissions come from agriculture. This puts New Zealand in a unique

position in comparison to other developed countries, in terms of reducing their GHG emissions, in accordance with the Kyoto Protocol and the Paris Agreement. Her presentation, also, further underlined the description given by Dr Beverly Henry of the current situation of soil carbon in New Zealand. Due to favorable soil carbon stocks, soil health management in New Zealand mostly prioritizes maintaining the soil carbon content and reducing losses. Around 40% of the agricultural land of New Zealand is covered by perennial pastures and is used for year-round grazing which favors carbon sequestration. Furthermore, some of the volcanic soils, in New Zealand, have a high capacity for storing carbon. Dr Jha gave an overview of several research projects from her institution, that aim to reduce soil carbon losses. The different approaches involve pasture diversification, silvopastures and regenerative agricultural practices (inversion tillage, biochar). There is also a large benchmarking project in progress, which aimed to measure soil carbon losses within the topsoil over a period of 10 years. Dr Jha is also currently involved in a project that explores the potential positive effects of planting shelterbelts in pastures, on soil carbon and nitrous oxide emissions.

THE WORK OF FARMERS' AND FORESTERS' ORGANIZATIONS, IN THE FIELD, FOR SOIL HEALTH.

The first session continued with a presentation on the activities of Carbon Farmers Nepal by **Mr. Ramji Prasad Bhattarai** (Operations Manager of Carbon Farmers Nepal - Nepal). Carbon Farmers Nepal was inspired by their Australian counterpart and have started their work in 2018. Mr. Bhattarai shortly described the situation in Nepal. Around 60% of Nepal's population are dependent on agriculture. However much of the agricultural land in Nepal is threatened by migration and other factors that reduce its overall productivity. Due to very low industrial activities, the overall contribution of Nepal to global emissions is rather low. However, most of its emissions come from agriculture and transportation which is reflected in the country's NDCs. Carbon Farmers Nepal is engaged in capacity building, such as training farmers in sustainable practices like agroforestry, mulching, no tillage etc. They also coordinate with governmental, educational and research institutions. Mr. Bhattarai provided some examples of their work in the field, including an agroforestry project involving the use of Moringa trees.

The next presentation by **Mr. Nicolo Aberasturi** provided some insight of the situation of the Philippines. The Philippines are marked by a high percentage of sloped arable land (>60%), heavy rainfalls (80 inches/year) and high number of Typhoons (15-20 each year) leaving the country in a highly vulnerable state regarding climate change. Most of the soils in the Philippines are already degraded. There is also a high prevalence of biodegradable wastes (60%). Mr. Aberasturi introduced his company Earth Flora whose work mainly revolves around the design, promotion and implementation of circular, sustainable food systems that incorporate bio wastes both in rural and urban communities. This involves composting, urban horticulture, no-tillage etc. EarthFlora also produces soil amendments and biochar. Earth Flora's efforts currently cover over 400 hectares of land.

Mr. Kariyawasam Mayuwana Gamade Thilak (Executive Director of the Lanka Organic Agriculture Movement - Sri Lanka) provided insights in the activities of the Lanka Organic Agriculture Movement which has been active, in Sri Lanka, since 1995. They especially focus on capacity building, demonstrating to farmers the advantages of organic farming and providing them with training. He further showed some examples of the successful work of the Organic Agriculture Movement and stressed the fact that agrobiodiversity can only be achieved with the contribution of the farmers.

The last speaker of the day, **Ms. Jayakashmi Balasundaram** (Farmer of organic garden, Kanha Shanti Vanam - India) provided a broad look into her work, there. She outlined several of the projects at Khana SHanti Vanam which involve integrated farming approaches, seed collection, vermicomposting, agroforestry etc. Ms. Balasundaram affirmed the importance of diversification not only concerning crop and tree cultivars, but livestock as well.

This segment showed that capacity building is high on the agenda of farmers' and foresters' organizations regardless of the region. Knowledge transfer is key to the adoption of sustainable practices. However, which practices are suitable can vary greatly from region to region, according to local environment.



DAY 3

MONITORING, REPORTING AND VERIFICATION.

The first part of the conference's second session focused on the [science context and findings in the Asia-Pacific region](#). **Dr Jagadesh Yeluripati** (Senior Scientist Ecosystem Modeling, Information and Computational Science Department of the James Hutton Institute - UK) was the first speaker. He showcased that GHG emissions, in India, have significantly increased over the last few decades with energy and agriculture being the two greatest contributors. He also pointed out a slight increase in emissions from agriculture. However contrary to other sectors, investments in agriculture, targeted at reducing emissions can also increase food system security. So far agriculture lags behind the other sectors in terms of reducing emissions. In order to use the technical potential of carbon sequestration (0.9 to 1.8 petagrams of carbon) and reach net zero on farm level, a credible MRV system enabling carbon trading is required. Dr Yeluripati described the following three criteria for a credible MRV system:

- Ability to demonstrate the overall savings of carbon and permanence of carbon
- Ability to track carbon
- Ability to account for carbon

While many MRV systems already exist none of them, so far, fulfill all three criteria. Dr Yeluripati continued on by presenting the RETINA project (funded by the Natural Environment Research Council (NERC)) which was conducted by the James Hutton Institute in collaboration with Aberdeen University and the UK Centre for Ecology and Hydrology. The main goal of this project was the development of an iterative near real time MRV system, which incorporates a hybrid approach combining monitoring, modelling (DNDC (DeNitrification DeComposition), ECOSSE (Estimation of Carbon in Organic Soils – Sequestration and Emissions) model, and BASGRA (BASic GRAsland model)) and measurements in real time. The system also contains an app that measures the impact of farming practices and feeds the iterative models, improving the accuracy of their predications over time. The completion of the project resulted in the creation of a start-up company called CarbonXtras.

The next speaker, **Mr. Navin Horo** (GIZ - India) spoke on the deteriorating soil health in India, which also causes fertilizer inefficiency forcing higher inputs. He stressed the importance of considering all the aspects and interlinkages of soil as a whole. Mr. Horo provided several examples of economic approaches in order to promote sustainable practices such as the use of urban organic wastes as composts combined biochar through the network of the Indian Farmer Producer Organization (FPO). While emphasizing that the private sector has already brought great examples of such approaches, Mr. Horo pointed out that these have yet to be implemented on a larger scale. He identified three necessary key steps in order to implement:

- Integration of expert knowledge with governmental initiatives
- Identify additional incentives for applying sustainable practices (not only carbon markets)
- Collaboration and sharing of experiences and knowledge; avoidance of duplicating efforts

Mr. Horo concluded his presentation with an invitation to other organizations to share their experiences.

Mr. Falguni Ganguly (Lead speaker, Digital Green - India) also spoke on the increase in fertilizer use and soil degradation in India. He stressed as well, the need to use the potential of MRV systems, in order to help farmers to make data driven decisions. He described, in more details, the activities of his organization. Digital Green is active in South-East Asia and Africa. Their study in Bihar involves a MRV approach which is meant to support decision-making by farmers utilizing collected field data. They promote evidence-based emission reduction practices and provide a MRV platform where the farmers can record their data at field level with extension workers verifying it and feeding the data into a digital tool for further analysis. Over the course of the project, 275 field-level extension workers have already been trained to use the digital tool. The analysis provided by this, will also open new possibilities to traders, for direct marketing. Digital Green plans to provide to 20,000 farmers with video advisory and around 5,000 farmers with site specific advisories. By the end of 2023, they will progressively reach 25,000 farmers. The greatest challenges consisted in convincing farmers to make use of this technology, on one hand and the acquisition of field data on the other hand.

Dr U. Surendran (Principal Scientist of Headland and Water Management Research Group, Center for Water Resource Development and Management - India) described the efforts of the Headland and Water Management Group to list and to evaluate different existing soil carbon calculators worldwide. Based on their insights they developed their own carbon calculator tools making use of field data from the region of Kerala. Their studies revolved around different nutrient and irrigation management for example, utilizing c-flex equipment, alkali trap method and Eddy covariance flux towers and also incorporating different models specifically for the humid tropical zone. Dr Surendran's presentation showed that, while elements of already existing MRV tools can be incorporated into newly developed tools, they also have to be specifically adapted to the site-specific conditions (regarding measurements and applied models).

Dr Luu took this opportunity to speak about the efforts of the international "4 per 1000" Initiative to develop a link on the "4 per 1000" website (available during 2024) that will list MRV tools and recommend suitable options based on the user's parameters.

Moving away from field measurements, **Dr Praveen Pankajakshan** (Vice President Data Science & Artificial Intelligence, Head of CropIn AI Labs, CropIn Technology - India) gave some insights in working with satellite data (Sentinel-1, Sentinel-2, VIRS (Visible Infrared Imaging Radiometer Suite) data & hyperspectral data). His work involves an approach utilizing spectral signature data from satellites that help to identify land use and land classification. This approach was successfully tested in rice paddies. Dr Pankajakshan emphasized that satellite data is an invaluable supplement to actual field measurements.

The MRV segment showed the high importance of MRV systems in order to scale up measures for carbon sequestration. It also emphasized the need for regionally adapted MRV tools and the need to provide training to local farmers ; so that they can take advantage of these tools. The segment showcased that there are several approaches currently under development in the Asian region.

UNDERSTANDING THE FUNCTIONAL MECHANISMS OF SOIL LEADING TO CARBON SEQUESTRATION

Dr Mangi Lal Jat (Global Research Program Director, Resilient Farm and Food System in ICRISAT, on behalf of TAAS, Trust for Advancement in Agricultural Science - India) outlined some of the challenges of implementing regenerative agriculture at national and global levels. He pointed out that the broad definition of regenerative agriculture holds some danger, such as the temptation for green washing. He also stressed the importance of a diverse approach that does not rely on one system. Furthermore, the research and development conducted, in the area of regenerative agriculture, needs to be more holistic and less "component-centric", in order to avoid problematic trade-offs. Dr Jat described a holistic integrated approach, which covers the three levels of farm, landscape and food systems. Dr Jat also pointed out the synergy between industry and agriculture with agriculture offsetting the industry's emissions, through enhanced carbon sequestration. In this context, carbon markets will be an important factor promoting the implementation of regenerative agriculture, on a larger scale. Dr Jat also identified key factors that will enable the shift towards regenerative agriculture in India:

- A change is needed in people's mindset towards agriculture. This will require capacity building and knowledge sharing.
- A holistic, systemic approach is required instead of focusing on singular components such as plot level, plant level etc.
- A national mission on regenerative agriculture, strengthening research is required.
- Carbon credits need harmonized methods, protocols, tools, and policies.

The next speaker, **Dr Sheetal Sharma** (Senior Scientist Soil Science, Research Lead Digital Tools, Sustainable Impact Department, of IRRI International Rice Research Institute - India), affirmed that a transition to regenerative agriculture is necessary in order to increase soil health and farmland fertility and to ensure sustainable livelihoods. Dr Sharma described the approach from IRRI which not only covers the gathering of data on different soil types but also working with the farmers on landscape scale. Special importance is attributed to the identification off flow cost site-specific technologies and digital tools that farmers can use. Dr Sharma also provided an example of site where the implementation of a regenerative system yielded improvements. Other experiences also showed the importance of engaging communities as a whole not only single farmers in order to implement regenerative agriculture on larger scale. The collaboration with national institutes and within farmer organization is also an invaluable tool for capacity building and knowledge sharing.

Professor Andong Chai (Chinese Academy of Agriculture Science - China) presented a large-scale project on soil organic farming which is conducted on 60 sites (10 soil types, 10 crops).

Dr Suzanne Reynders (French National Research Institute for Agriculture, Food and Environment – INRAE - France) introduced ORCASA (EU Horizon Project) which brings together international stakeholders in order to develop and improve techniques to sequester carbon. She also provided an overview of involved partners and the overall structure and activities of ORCASA. Their work includes knowledge sharing, capacity building, research alignment and calls, and monitoring, reporting, and verification harmonization. The Scientific and Technical Committee of "4 per 1000" collaborate with ORCASA in the same function.

Dr Tika Bahadur Karki (Senior Scientist, Chief of the National Agronomy Research Centre, Nepal Agricultural Research Council, and President of the Agronomy Society - Nepal) described the current state of soil health in Nepal. Most of the agricultural soils have a deficiency in soil carbon. Furthermore, forest areas in Nepal are threatened by fires, while the monsoon season can cause landslides. Nepal has introduced several policies involving soil management:

- Organic and bio-fertilizer working guidelines (2012)
- Organic fertilizer subsidy directives (2012)

- Organic fertilizer subsidy directives for Prime minister agriculture modernization project (2016)
- Agriculture Development Strategy (2016 - 2035) which includes soil organic matter, as an important sustainability indicator

The Sustainable Soil Management Program (SSMP) has introduced several promising technologies such as green manuring, on-farm composting, inclusion of legumes in the cropping system etc.. The UNDP also launched a program to protect water resources in Nepal (2020-2024). The Nepal Agricultural Research Council itself is involved in the promotion of biochar production, the preparation of a soil organic carbon map of Nepal, the implementation of conservation agriculture practices and crop diversification.

Professor Ashraf Ali Biswas (Dean, Faculty of Food Science and Technology - Bangladesh) introduced his research on the correlation between soil beneficial micro-organisms and ruminal methane emission reduction. His research showed a possible reduction of 25% in methane due to the introduction of beneficial micro-organisms. Future research will see the use of the micro-organism in grassland. This presentation showed that it is also important to include livestock management and technologies into considerations, for soil health.

Dr Jashim Uddin (Professor, Department of Soil, Water and Environment of the University of Dhaka - Bangladesh) showed that 70% of the soils in Bangladesh are deficient in soil organic matter content. Between the 90's and 2012, there was a significant decline in soil organic matter, across both the Ganges and Brahmaputra alluviums. The SOC decline was most severe in higher sites. The decline in SOC is further promoted due to mono-cropping and insufficient soil coverage. In this context, Dr Uddin conducted research to evaluate the effects of peanut treated soils, residues on soil quality and bio resource management and recommendation policies to adopt soil health restoration.

SCIENTIFIC EVALUATION OF PRACTICES SUCH AS BIOCHARS, CROP RESIDUS USES, ETC.

Professor Jagdish Kumar Ladha (Adjunct Professor, Department of Plant Science, UC Davis University - USA, member of the "4 per 1000" initiative's Scientific and Technical Committee) delivered a keynote speech on carbon and nitrogen management for climate resilient crop production and UN SDGs achievement. While it is accepted that global agriculture has the capability to feed 8-10 billion people, the overarching question remains if this can be achieved without compromising environment and public health. Professor Ladha suggested climate resilient crop production as a way to meet this challenge. It describes agricultural systems that can withstand and adapt to the effects of climate change while maintain/increasing productivity and ensuring food security. This depends on the introduction of climate-smart practices, technologies and strategies. Professor Ladha emphasized that the biological processes of carbon and nitrogen fixation need to be increased. He also provided a list of climate smart practices, specifically pointing out conservation agriculture and nitrogen management as options that yield great benefits in terms of biodiversity, resilience to climate change and productivity. Professor Ladha provided an example of a field trial that showcased the suitability of conservation agriculture as climate smart practice.

Mr. Stephan Demmel (Consultant, Fandem Consulting, Belgium and Community Biomass - Indonesia) introduced the problematic issue of crop residue burning by using the Punjab region as an example. The burning of crop residues is a major contributor to GHG emissions. Mr. Demmel introduced a project on biochar production via gasification making use of rice straw from farmers in the Punjab region. This process both yields biochar and syngas. The biochar can then be used by farmers to enhance soil properties. This project is an example on how an evidently harmful practice could be replaced by a practice that has a high economic and environmental potential. Mr. Demmel pointed out however that such an approach needs to be adapted to the site-specific conditions both in terms of applied technology and the communication towards the involved stakeholder groups.

Dr Raosaheb Kote (BAIF - India) introduced BAIF, an Indian NGO which has active programs in 14 states in India, affecting almost 95,000 villages. Most of their programs focus on livestock development, sustainable resource management and climate actions. BAIF is also involved in landscape restoration, which features approaches such as farm ponds, traditional tank rehabilitation and spring shade management. Furthermore, they promote approaches for soil health management. Especially their agri-horty forestry approach (Wadi) has been adopted successfully by farmers.

Dr Sai Bhaskar Reddy Naka (Expert in biochar, Telangana - India) spoke on biochar as well. He remarked on the current a lack of a common global standard for biochar. Similarly to Mr. Demmel, Dr Naka pointed out the high potential of this technology for utilizing crop residues which under normal circumstances would be burned. Dr Naka also pointed out that it needs to be considered that the effects of biochar application highly depend on both the quality of the applied biochar and the specific soil conditions.

MOBILIZING CITIZENS, COMMUNITIES, AND LOCAL GOVERNMENTS

Dr Praveena Sridhar (Team Member of the Save Soil Movement, Conscious Planet, Isha Foundation - India) gave the opening speech for this segment. She spoke on the importance of directly engaging with farmers and their communities in order to promote soil health. Referencing the impact of other movements in their respective fields, she described the efforts of the Save Soil Movement. Their work focuses on capacity building in rural areas and the promotion of regenerative agricultural practices. Dr Sridhar emphasized that much of the success of the Save Soil movement can be attributed to its inclusiveness and open mind for collaboration.

On a similar note, **Professor Andre Leu** (International Director of Regeneration International - Australia) described the exploits of his organization in terms of promoting regenerative agriculture among farmers worldwide. Similar to the Save Soil movement, Regeneration International has built many partnerships (over 500 partners in over 70 countries). Their latest project is meant to scale up regenerative agriculture by paying farmers, who implement such practices for their ecosystem services. According to their sources, regenerative agriculture systems can generate up to 30% better yields.

Mr. Murli Dhar (Director of Sustainable Agriculture Program of World Wildlife Fund - India) spoke on behalf of his organization, WWF. Originally focusing on animals, this organization has become very engaged in food systems, by now, due to the negative effects of conventional agriculture on wildlife and overall biodiversity. Their intervention in India started around 15 years ago and mostly involves working with private companies. Mr. Dhar highlighted the importance of agriculture, as part of the global economy (4.3% of global Indian Gross Domestic Product - GDP) and its contribution to the service (64.43%) and goods (27.59%) sector underlining its role as the first link of many supply chains. The decreasing productivity of arable land, in countries such as India, however, threatens the business of companies relying on agricultural products of those regions. Mr. Dhar shortly described an initiative between WWF and two Swedish companies in this context, that aims to make their whole supply chain more sustainable starting with the land management. This provides a good example on why and how private companies can take an interest in promoting sustainable land management as a means to secure and strengthen their supply chain.

Professor Jian Jinshi (China Biodiversity Conservation and Green Development Foundation (CBCGDF), Professor of the Institute of Soil and Water Conservation, Northwest Agriculture and Forestry and Chinese Academy of Science - China) gave an overview of the recent efforts and activities of the CBCGDF. They developed a biomass biochemical hydrolysis biotechnology that can breakdown agricultural waste, such as crop residues, and livestock manure, into water soluble, small molecules and cellulose etc. which can, then, be used as raw materials for the creation of environmentally sustainable products (seed blankets, film and water-soluble fertilizer). A production facility (100,000 tons of annual capacity) is located in Tong Chuan City (Shanxi province). They also developed mobile production facilities for this purpose. They also developed the CBCGDF standard as a guideline for field experiments and impact assessment for their products on yields, soil quality, soil carbon sequestration and greenhouse gas emission. This standard has been used in field experiments in the Shanxi and Hubei province where it was shown that their water-soluble fertilizer, has increased soil organic matter content, compared to chemical fertilizer or no fertilizer treatment. They are providing production application demonstration and technical services in order to promote the production of straw-based products and soil improvement on over 100,000 ha.

Like the other speakers from Nepal, **Professor Krishna Tiwari** (Institute of Forestry, Tribhuvan University - Nepal) also described the decreasing amount of soil organic matter for forest and cropland in Nepal (-0.01% per year) and the high susceptibility of cultivated land to soil erosion and landslides. Professor Tiwari mainly focused on the performance of indigenous practices for soil conservation and fertility management, especially highlighting a maize-millet crop system, which has favorable effects on soil quality. He also described an increasing trend of agroforestry and the imitation of organic farming. Until 2030, soil organic carbon will be increased by 1% in forests and croplands. 10% of wetland ecosystems will be restored as well.

Overall, the speakers of this segment highlighted the importance of communities, farmers' organizations and other groups in order to take action in the field, on a larger scale. Communities and organizations can be highly valuable tools for knowledge transfer, for example in case of peer-to-peer learning. A farmers' organization will also be in a better position to work with other organizations.

CARBON FARMING AS A BUSINESS MODEL

Mr. Suman Saraswathibala (Associate Director of Operations, Dr Reddy's Foundation - India) provided the keynote speech for the next segment. He introduced the Dr. Reddy Foundation which promotes regenerative agriculture in over 36,000 villages in 5 states of India. Their primary focuses are the three most common crops in India: rice, wheat and maize (60% of all croplands are used for cereals). Their approach includes a farmer-to-farmer extension model and capsule based learning. Mr. Saraswathibala pointed out that it is critical that the training is adapted to the local conditions and terminology. Tools used by the Dr Reddy Foundation involve nudge posters and Inter-process communication (IPC) based tools. In terms of MRV they

currently rely on collecting data in the field in order to generate quality credits. Building a network with the farmers has proven to be somewhat challenging both due to technical issues and human issues. This further underlines the need for investment in capacity building in rural areas. Mr. Saraswathibala showed that for example in the case of direct-seeded-rice 30% of the involved farmers have retained the technique and concluded that any newly introduced practice has retention between 25 and 30% among the participating people.

Mr. Arindam Datta (Senior Fellow, The Energy and Resource Institute -TERI) - India) spoke on biochar as a means to address environmental pollution, soil fertility and crop production. He introduced a pyrolysis unit developed by TERI which captures Volatile Organic Compounds (VOC) generated during the process. It also yields pyrolytic oil containing acetic acid, phenol and pyrdinol. One issue they have encountered is that currently much of the crop residues from agriculture are used in power plants. Studies conducted by TERI showed that there are significant differences in biochar's properties and effects depending on heat and biomass materials. Aside of the production of biochar TERI is also involved in land restoration utilizing mycorrhizae and oil zapper. Furthermore, their nano urea products have been approved by ICAR.

Mr. Sébastien Roumegous (CEO, Biospheres - France) reflected on the synergetic potential of regenerative agriculture as a tool to regenerate ecosystems and its positive impacts on the carbon and water cycle and biodiversity. He described an ongoing change of mind set of many companies in France regarding the ecological impact of their products and the resulting promotion of regenerative practices to improve it.

BUSINESS COMMITMENTS AND HANDS-ON ACTION

Mr. Anirudh Keny (Director of Business Development and Partnership APAC in Africa, Boomitra Inc. - India) introduced his organization to the audience. Boomitra Inc. is currently building a global network working with farmers all around the world. In order to monitor the effects of carbon farming practices, Boomitra Inc. combines their means of remote sensing with the direct measurements of local partners in the field. The carbon removals are, then, verified by third party auditors, enabling farmers to gain access to carbon markets. Mr. Keny emphasized that inclusiveness and transparency are the key elements for the effectiveness of carbon markets.

Ms. Sianiana Rokovucago (CEO, Foundation for Rural Integrated Enterprise, and Development (FRIEND) - Fiji) presented FRIEND, a Non-Governmental Organization based in Fiji. FRIEND is involved in the promotion of organic farming and rural development with a special focus on women's empowerment and youth work. The NGO has been around for the last 21 years and is mainly active in the western division of the Pacific Islands but there also has been some expansion towards the central and northern parts of the Pacific.

Mr. Sam Yamdagni (Managing Director of APAC, Amarenco Group - Thailand) gave a presentation about Amarenco's Y Cube Farms (located in Thailand) which incorporates regenerative practices for a sustainable production of high-quality vegetables. Based on YCube Farms, a Seed Project is being developed in cooperation with FASEP (Private Sector Study and Aid Fund is part of Project Subsidy Policy by France), Amarenco, experts from France, the Ministry of Interior (Thailand) and Naresuan University (Thailand). The goal of this project is the development of template for the establishment of similar farming sites.

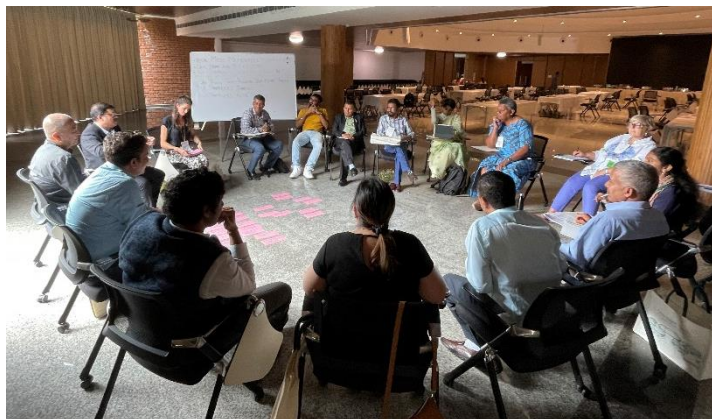
Mr. Kamlesh Kumar (Chairman & Managing Director of Hindustan Salts Ltd - India) highlighted the high potential of seaweeds and algae for photosynthesis and nutrient accumulation.

Mr. Kul Kauwid (Co-founder and CEO, Circonomy - Singapore), the final speaker of this segment introduced Circonomy's work in scaling biochar production. They provide farmers with on-site training and support for artisanal biochar production and application. Circonomy also runs a MRV platform that can scale the carbon removal via artisanal biochar production and application.

RESULTS FROM THE BREAKOUT SESSIONS (PLENARY)

In the afternoon of day two, participants split up in two break-out groups to discuss actions to boost soil restoration (group 1) and soil health and soils fertility (group 2) in the region. During the discussion, the participants started by identifying the problem scope and major causes for soil degradation in the region. The second part of the session, then, aimed at identifying promising approaches and actions for different stakeholder groups to restore degraded soils and enhance soil health and soil fertility.

As underlying causes and possible approaches to both topics are closely related and both groups came up with similar results, the following section will present the findings of both groups in a comprehensive manner.



UNDERLYING CAUSES

Regarding the underlying causes for soil degradation, participants differentiated between natural, socio-economic and agronomic/technological factors. Regarding the natural factors, climate change and resulting extreme weather events and conditions causing drought, flooding or forest fires and pest infestation were identified as the main drivers. But also inherent soil properties in certain agro ecological zones were described to impact soil resilience and soil fertility. Regarding the agronomic and technological factors, several farming practices were identified to cause or accelerate both physical and chemical soil degradation, including the reduction of crown and soil cover, burning of crop residues, especially in rice cultivation, over- and misapplication of mineral fertilizers and synthetic pesticides and use of heavy machinery. Concerning the farming system, monocropping as well as the missing or declining integration of livestock and crop production were found to be major cause soil degradation. Additionally, the lack of high-quality seeds further impacts biomass production, which results in lower inputs of organic matter in the soil and higher fertilizer requirements. Participants further presented a clear understanding of the socio-economic factors influencing farmers' and producers' scopes of action. On the one hand, they pointed to misdirected incentives from governments, as policies focus mainly on yield increases and put a strong focus on food but not on nutrition security. Furthermore, a lack of subsidies for organic fertilizers and government support to compensate yield decreases during the transition phase as well as the higher labour demand was highlighted. On the other hand, participants identified a lack of market mechanisms in favour of sustainably produced commodities and short comings in the price design for, e.g., organic products, which they further related to inadequate consumer awareness regarding the benefits of organic products. At the same time, insufficient knowledge transfer between the different stakeholder groups, the complexity of methodologies and maleducation and misinformation about the threats but also concerning the adequate application of mineral fertilizers were mentioned. Finally, fragmented landownership and short-term tenancies, the lack of protected areas but also insufficient accessibility of technologies were identified to cause or accelerate soil degradation.

CENTRAL LEVERS TO BOOST SOIL HEALTH, SOIL FERTILITY AND SOIL RESTORATION

ENABLING ENVIRONMENT (POLICY LEVEL)

Participants called for a common strategy regarding a shift to sustainable agriculture for the entire Asia - Pacific region, which pushes governments to consider soil health in their national policies and encourages knowledge exchange between countries. They further stressed the importance of redirecting subsidies towards sustainable production and innovative solutions. This could include direct incentives for e.g., adapted machinery, organic fertilizers and amendments and diversified production systems, as well as market correction. The participants further suggested that governments promote carbon markets, while ensuring that soil health indicators are considered in the standards. Furthermore, participants highlighted the need to fight corruption from big agro-food companies which prevent the government from taking action. Regarding soil restoration, there was a call to take rigorous steps towards banning harmful practices in vulnerable regions. Generally, participants agreed that there was a need for regulations concerning upcoming technologies and that development in the agricultural sector should not be solely market driven.

RESEARCH AND DEVELOPMENT

There was a strong call for an improved communication between sciences and producers to enable needs-based research design which especially considers the needs of small-scale farmers, but also, to better integrate new technologies, in the business sector, to enable the scaling up of new approaches. At the same time, participants expressed the need for research to consider social and environmental changes and verify former findings regarding the current conditions. They also expressed the need for a cost-benefit analysis, which proves the effects of mismanagement but, also, the advantages related to sustainable production for society as a whole. Participants also stressed the opportunities related to the inclusion of NGOs and farmer organizations in action researches and the need for improved and affordable MRV systems for carbon credit verification. Concerning technical development, participants highlighted the need to design farm machines which respond to the situation of small holders, and which can then be linked to local markets.

BUSINESS SECTOR

Innovative business models were identified to hold a significant potential to support the transition to sustainable agriculture. Regarding the access to finance, no-interest loans by the administration which pay into evolving funds for producers and enterprises along the value chain, who are devoted to sustainable production, were mentioned. Furthermore, renting-sharing models, with enterprises renting adapted machinery to producers, were thought to be a new business branch to promote the transition. Another tangible idea was the support of enterprises engaged in the production of organic fertilizers, which saves organic producers resources and leverages the uptake of organic fertilization. Regarding the market design, the importance of segmenting and targeting of costumers was brought up. Finally, the participants called on responsible business ethics, which combine environmental well-being with profitability and include youth in decision making processes.

CIVIL SOCIETY

Participants identified a strong need for awareness raising at all levels. In that regard, they referred to better education on soils and land management, starting at school and university level; but also, to consumer education and awareness raising at a political level.

FARMERS AND PRODUCERS

Capacity building and access to finance were identified as the main aspects to support farmers in their shift to a sustainable production. There was a strong call for sustainability-oriented extension programs and their institutionalization. Participants pointed out, that many times methodologies developed by scientists were too complex to be adapted especially, but not only, in small holder settings. They called for better demonstration of technologies and their effectiveness as well as for localized solutions and information. Finally, the need for better accessibility of available information via mobile devices and in local languages was highlighted.

END OF THE PLENARY SESSION

The results of the breakout session were presented by Dr Paul Luu and Dr Claudia Schepp who each had coordinated one of the breakout groups. Dr Luu also quickly summarized the most important take away messages of the conference. Afterwards, Dr Luu expressed his gratitude to the organizing partners of the conference and closed the session.



DAY 4

ICRISAT VISIT



The conference was concluded with a field trip to the ICRISAT Research Station. The trip began with a tour of the main facility of ICRISAT. Here, the participants were provided with information on the origin of ICRISAT, its global involvement, current projects, and its partners. Particular attention was paid to the special site conditions of the ICRISAT facility near Hyderabad, which is characterized by the presence of two different soils that are typical for the tropics. Afterwards the participants had the opportunity to visit some of the test fields. Among other things, cultivation systems and comparative trials of different varieties were shown there. After the demonstration of the test fields, the participants were given a tour of the laboratory complex. The final part of the visit involved a presentation of Managing Resources for Integrated Development of Agriculture (MRIDA), a game app developed to sensitize farmers on soil carbon sequestration.



CONCLUSIONS

The conference showcased several points:

- In Asia, in particular, large areas of agricultural lands are affected by increasing **soil degradation**. This impacts greenhouse gas emissions and threatens food security in the region. However, the speakers' presentations also showed a growing awareness among stakeholder groups of the **importance of soil health**.
- There were many examples of **adapting agroecological practices** in the field during the presentations. These included **agroforestry systems, no-till practices via conservation agriculture, crop diversification, use of livestock manure, composting**, etc. Particularly striking in this context, was the great interest in the production and application of biochar. **Biochar**, if a suitable technical process is used, is a much more environmentally friendly use of crop residues than burning them. The use of biochar is considered to have positive effects on soil health. Depending on the technology, the production of biochar, also, yields more products such as biogas or pyrolytic oil. As with all the other practices mentioned, the production and use of biochar must be adapted to local conditions and communicated/accessible to farmers. It is important to note that there is no single approach for restoring, enhancing, and preserving soil health for every region; instead approaches need to be site-specific.
- Other important points that came up were the **threat of rising sea levels to agricultural land** (Fiji Islands already experience this) as well as the issue of **water collection in drylands**.
- **Capacity building and community engagement** are essential for a lasting implementation of good practices on a large scale. Providing training to members of a community helps to speed up the **knowledge transfer via peer-to-peer learning**. **The founding of farmers' organizations** can also make it easier for farmers to engage with other organizations.
- It was also mentioned several times throughout the conference that there needs to be a **better transmission of knowledge from science to practitioners**. There were demands for a **more holistic and systemic approach in research**.
- **MRV systems and tools** were widely presented and discussed during the conference. Their role to scale the impact of implemented sustainable practices on soil organic carbon sequestration cannot be understated. They represent a potentially great tool for actors in the field, especially farmers provided they are affordable, easy to access/use, and also adapted to the local conditions.
- **Carbon markets** can be considered an invaluable tool to incentive the implementation of sustainable practices in the field. They require however a resilient and transparent MRV System. The accessibility of carbon markets for farmers is also an important issue.
- Businesses are also taking up on the fact that the decreasing soil health threatens to compromise their **supply chain** and start to take action in order to make it more sustainable.

ANNEX

INTERVIEWS

The following participants to the conference, mainly from the farmers' stakeholder group, were interviewed to testify about their sustainable transition in the fields. These interviews and the funding of their travel arrangements were made possible thanks to the support of the FARM Foundation, based in France:



- Mr. Nicolo Aberasturi, Earth Flora Inc, The Philippines
- Mr. Kariyawasam Majuwana Gamage Thilak, Executive Director, LOAM (Lanka Organic Agricultural Movement)
- Mr. Ramji Prasad Bhattarai, Director, Carbon Farmers of Nepal
- Mr. Jaspal Singh Chattha
- Ms. Jaya Lakshmi Balasundaram

MOU

On 23 September 2023, at the end of the Asia-Pacific "4 per 1000" Regional Meeting, a Memorandum of Understanding was officially signed between **Honorable Kamlesh D. Patel**, known as **Daaji**, Global Guide of Heartfulness, representing Heartfulness Institute, and **Dr Paul Luu**, Executive Secretary of the international "4 per 1000" Initiative. The 2023 edition of the "4 per 1000" Asia-Pacific Regional Meeting has been co-organized by "4 per 1000" and the Heartfulness Institute.

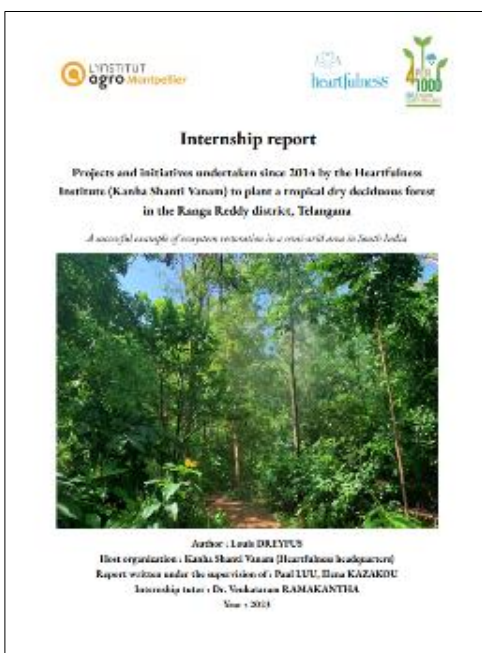


BOOK

The English version of the book issued in June 2022, "Farmers have the Earth in their hands" was published in India in a special edition with a second preface by **Daaji**, the global spiritual guide of Heartfulness Institute at the occasion of the Asia-Pacific "4 per 1000" Regional Conference organized in Kanha Chanti Vanam from 19 to 22 Sept. 2024. This special edition was sold out in Kanha's bookstore, in a few days.



METHOD COLLECTION WORK IN KANHA



Mr. Louis DREYFUS (intern, on behalf of "4 per 1000" during for 5 months from March to July 2023, from Institut Agro Montpellier, France) who, with a financial support of the Heartfulness Foundation, helped Heartfulness Institute to gather all scientific data on the ecosystem restoration project in Kanha close to Hyderabad in India. Louis Dreyfus's report focuses on the initiatives led by the Heartfulness Institute, starting from 2014 and aiming at restoring a fully functioning tropical forest ecosystem in a hot semi-arid area in Kanha Shanti Vanam. For this project, many native, local, and endangered species from India have been selected; all of them were widely planted in the center through tree translocation from road widening projects and tissue culture. Kanha has also created two "nurseries" to nurture and grow millions of young saplings before their plantation. A complete rainwater harvesting system has been built to redirect and store rainwater in various water ponds holding 300 million liters, and to recharge groundwater through percolation. Efficient watering methods have been implemented to spare water in agriculture, and traditional organic pesticides and fertilizers are prepared on-site instead of using chemicals. This newly planted forest has started to modify its close environment. The land surface temperature in forest areas has been at least 1.5°C lower than outside the center since 2019 (up to 3.5°C in 2022) and the NDVI index went from 0.23 in 2016 to 0.49 in 2022. The soil pH value gained 1 point in forest zones and the organic carbon content slightly increased too.

MEETING AGENDA

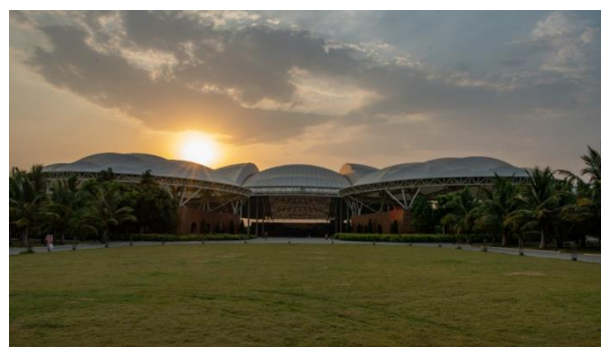
Overview table of the program of each day

Tuesday 19 September

18:00 Welcome cocktail - Arrival of participants

Wednesday 20 September

- 08:30 - 09:00 Registration, Opening of the Posters exhibition, Networking
- 09:00 - 11:00 Inauguration and opening session (high level policy participation)
- 11:00 - 11:30 Signature of documents to join the « 4 per 1000 » Initiative and other MoUs
- 11:30 - 12:00 Coffee break and Group photo
- 12:00 - 12:45 Keynote Speeches
- 12:45 - 14:00 Lunch
- 14:00 - 18:00 The context in the Asia-Pacific region
- 14:00 - 15:45 Policy approaches to fostering Soil Health at national level and situation of the international « 4 per 1000 » Initiative in the region
- 15:45 - 16:15 Coffee break
- 16:15 - 18:00 The work of Farmers' and Foresters' Organizations, in the field, for Soil Health.
- 18:00 - 18:15 Wrap-up Day 1
- 19:00 - 22:00 Reception dinner



Thursday 21 September

- 08:00 - 10:45 Science context and findings in the Asia-Pacific region
- 08:00 - 09:00 Monitoring, Reporting and Verification.
- 09:00 - 10:00 Understanding of functional mechanisms of soil leading to Carbon sequestration.
- 10:00 - 10:45 Scientific evaluation of practices such as biochars, crop residus uses, etc.
- 10:45 - 11:15 *Coffee break*
- 11:15 - 13:00 Civil society and the business sector as agents of change for Soil Health
- 11:15 - 12:00 Mobilizing citizens, communities, and local governments
- 12:40 - 13:00 Business commitments and hands-on action
- 13:00 - 14:00 *Lunch break*
- 14:00 - 14:15 Introduction of the breakout sessions (Plenary).
- 14:30 - 16:00 Breakout sessions on “priorities, needs and commitments” for healthy soils.
Breakout Session 1: Multi-stakeholder action to boost soil health and soil fertility
Breakout Session 2: Multi-stakeholder action to boost soil restoration
- 16:00 - 16:30 *Coffee break*
- 16:30 - 17:30 Presentation of the results from the breakout sessions (Plenary), followed by a discussion with participants.
- 17:30 - 18:00 Presentation on elements for the regional road map deduced from the previous sessions.
- 18:00 - 18:30 Conclusion in plenary and closing remarks and speeches.

Friday 22 September

- 08:00 - 13:00 Visit of ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) Research station
- 13:00 - 14:00 *Lunch at ICRISAT*
- 14:00 End of the Regional Conference - Departure of Participants.

Saturday 23 September

- 11:00 - 12:00 Signature of a MoU (Memorandum of Understanding between the international “4 per 1000” Initiative and Heartfulness Institute.

Invitation

4 Per 1000 & Heartfulness Cordially Invite You to
**The « 4 per 1000 »
 Asia-Pacific Regional Conference**
 on Soil Health to address Climate Change & Food Security
19th-22nd, SEPT, 2023
 Venue : Kanha Shanti Vanam (Hyderabad, India)

The event will be inaugurated in the divine presence of **Rev. Daaji** and in presence of dignitaries and high level international scientists from 10 countries on
20th September 2023 at 9.00 am
 and the keynote will be addressed by

Chief Guest:
 Shri. Singireddy Niranjan Reddy
 The Honourable Minister for Agriculture Govt of Telangana, Hyderabad, Telangana

Guest of Honour:
 Hounourable Saklasi Raiseku Ditoka
 Minister for Rural, Maritime Development & Disaster Management, Fiji

Guest of Honour:
 Shri M. Raghunandan Rao, IAS
 Honourable Secretary of Agriculture Govt of Telangana, Hyderabad, Telangana

Guest of Honour:
 Dr Paul Lulu
 Executive Secretary of the international “4 per 1000” Initiative

With the support of:
 MINISTÈRE DE L'AGRICULTURE ET DE L'ALIMENTATION
 DR. REDDY'S FOUNDATION
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Please contact **Chandra Polagaari** @ Perfect Relations for further details @ +91 96035 76330





Launched at UNFCCC CoP 21 in December 2015, the **international "4 per 1000 Initiative: Soils for Food Security and Climate"** aims to show that agriculture, and in particular agricultural soils, can provide concrete solutions to the challenge of climate change while at the same time meeting the challenge of food security by implementing agricultural practices adapted to local conditions: agroecology, agroforestry, regenerative agriculture, conservation agriculture, landscape management, etc.

The international "4 per 1000" Initiative promotes the natural sequestration of organic carbon in soils and brings the vision of healthy, carbon-rich soils to fight climate change and eradicate world hunger.

Based on solid scientific documentation, the international "4 per 1000" Initiative encourages all voluntary actors around the world to engage in a transition towards a regenerative, productive, highly resilient agriculture, based on appropriate management of land and soil, which creates jobs and incomes and thus leads to sustainable development.

To join the international "4 per 1000" initiative, click here: <https://4p1000.org/join/?lang=en>

If you have any questions or suggestions, please send an e-mail to:

socialmedia.admin@4p1000.org

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INTERNATIONAL « 4 PER 1000 » INITIATIVE: SOILS FOR FOOD SECURITY AND CLIMATE

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