



TRAINING REPORT

FOUR DAYS TRAINING PROGRAMME ON ENTREPRENEURSHIP AND SKILL DEVELOPMENT THROUGH MEDICINAL AND AROMATIC PLANT BASED FORMULATIONS FOR NODAL FARMERS AND OFFICERS OF MEGHALAYA UNDER CSIR-AROMA MISSION.

JULY. 25-28, 2023

**CSIR- CENTRAL INSTITUTE OF MEDICINAL AND AROMATIC PLANTS,
LUCKNOW**

SPONSORED BY –

**INSTITUTE OF NATURAL RESOURCES & MEGHALAY BASIN DEVELOPMENT
AUTHORITY (MBDA), GOVERNMENT OF MEGHALAYA, SHILLONG.**



TABLE OF CONTENTS

	Page
1. Introduction	3
2. Day 1	
SESSION I: Inauguration and Introduction to the Programme.	4
SESSION II: Visit of Experimental Farms & MANAV Garden.	4
SESSION III: Lecture on cultivation & technologies of	5
CSIR–CIMAP for MSME & Start-ups.	5
SESSION IV: Medicinal & Aromatic plant based products from	
translational research at CSIR-CIMAP.	
SESSION V: Hands on training of making Incense sticks.	6
3. Day 2	
SESSION I: Processing and Value addition of aromatic plants for	
herbal products.	6
SESSION II: Lecture on FloMop (Floor disinfectant) and Mos-EX	
(Mosquito Repellent Lotion).	7
SESSION III: Hands-on training of making FloMop (Floor	
disinfectant) and Mos-EX (Mosquito Repellent Lotion).	7
4. Day 3	
SESSION I: Analytical techniques in Medicinal and Aromatic	
Plants and its value-added products.	7
SESSION II: Lecture on making of AloeVera based Gel/Cream.	8
SESSION III: Production of raw materials for herbal products.	8
SESSION IV: Hands-on training of AloeVera based Gel/Cream.	8
5. Day 4	
SESSION I: Industry Visit.	9
SESSION II: Experience and feedback of training program.	9
SESSION III: Valedictory function and certificate distribution	
program.	10
6. Acknowledgement	10
7. Participants List	11
8. Participants Feedback	12-18

Introduction

The Megh-Aroma Mission since its inception have been able to promote the cultivation and primary processing of medicinal and aromatic plants (MAPs) in large scale across the state. Farmers in rural areas have expanded the aromatic crops where essential oil have been distilled and market. In order to stay liable to the objectives of the mission in which value addition of essential oil and entrepreneurship development are the key areas for enhancing rural livelihoods and encouraging agribusiness in the state. The growth potential of MAPs sector is enormous as the consumption of the medicinal and aromatic plants and value-added MAPs products is growing at a very fast pace. In MAPs sector, the entrepreneurship development is a key driver for promoting and sustaining the momentum of growth, exploiting the full potential of MAPs sector and providing employment opportunities to the growth population of the country. This is an inter-disciplinary program that will cover a wide range of topics addressing the economic, managerial and technological aspects of MAPs entrepreneurship development. With this background in mind, the Institute of Natural Resources, Meghalaya in collaboration with CSIR-Aroma Mission have organised a ***‘Four days training programme on entrepreneurship and skill development through medicinal and aromatic plants based formulation for nodal farmers and officials of Meghalaya at CSIR-CIMAP, Lucknow’***. The training aimed to empower the farmers with essential competencies to foster a productive and cohesive work environment for different products such as Incense sticks, Herbal Floor cleaner, Mosquito Repellent Body Lotion and Aloe Vera Gel. The program was conducted on the 25th of July 2023 to the 28th of July 2023 and was attended by Twenty-four participants from various districts within Meghalaya.

CSIR-CIMAP has the expertise in cultivation, processing and value addition of MAPs and guiding the farmers, entrepreneurs, private sector and other Govt. departments from time to time. CSIR-CIMAP has also got several process patents and their variety patents and also transferring these technologies to different stakeholders. They also have expertise in designing and developing improved field distillation unit and supplying to different industry, entrepreneurs and farmers from time to time. CSIR – CIMAP is also developed a state of art incubation facility for training and manufacturing of herbal formulations to budding entrepreneurs.

The following report outlines the details and outcomes of a training programme focused on Entrepreneurship and Skill Development through CSIR-CIMAP on Medicinal and Aromatic plant based formulations amongst the aspiring farmers.

DAY - 1

SESSION I: Inauguration and Introduction to the Programme.

The training was formally initiated by Dr. R K Srivastava, Pr. Scientist CIMAP who shared the objectives of the training and also welcomed the participants. The Director of CSIR- CIMAP, Dr. Prabodh K. Trivedi was welcomed to the dais to deliver the inaugural note and spoke about the importance of Medicinal and Aromatic Plants and how can entrepreneurial farmers make use of the formulations and technologies for developing many plant based products which could uplift and sustain the livelihood of the community. The dais was shared with Ms. Bhalang Kamar who spoke about the success of the project whereby wastelands at Laskein Block,



West Jaintia Hills were reclaimed using aromatic crops (Citronella and Lemon Grass) in convergence with the Institute of Natural Resources, Meghalaya.

SESSION II: Visit of Experimental Farms & MANAV Garden.

Following the opening session, Mr. Manoj K. Yadav T.O. & Mr. Durga Prasad Mandala T.O.



accompanied the participants on trips to the experimental farms and MANAV Garden. The attendees learned about the many

MAPs that were connected to various illnesses unique to each section of the human anatomy during the tour. This garden was symmetrically designed to resemble the human form, complete with a head, hand, and legs. Two to three plants related to the particular ailment present in the body were present in each section of the body.

After that, the participants headed to the farms where they learned about the several varieties of the Mentha plant, including *Mentha arvensis*, *Mentha citrate*, *Mentha viridis*, *Mentha citrate*, *Mentha piperita*, and *Mentha spicata*. These types, thanks to their distinct chemical makeup, have a variety of uses. Later, they made their way to the bio-composting facility, where they learned how to use the herbs that had already been distilled for compost.

SESSION III: Lecture on cultivation & technologies of CSIR–CIMAP for MSME & Start-ups.

Dr. R.K. Srivastava, a senior scientist, took up this topic and demonstrated how effective cultivation techniques were needed for the production of essential oils. Over the past few years, CSIR-CIMAP has created a large number of variants. He also emphasised the need to grow Pyrethrum (*Chrysanthemum cinerariifolium*), a novel aromatic crop, in Meghalaya. Creams to ward off mosquitoes can contain the essential oil from pyrethrum as a component. Additionally, he discussed the methods created for assessing the chemical components of various aromatic crops, such as Gas Liquid Chromatography, HPLC, HTPLC, etc. CSIR-CIMAP also built a 500 kilogramme mobile distillation device to make it simpler for communities and villages to get their herbage distilled without having to travel for many kilometres. CIMAP has established Good Manufacturing Practices (GMP) certified facility namely “Technology Business Incubation Centre (TBIC)” facility to support/promoting the start-ups/NGO/MSMEs to make them as a self-reliant and sustainable.

SESSION IV: Medicinal & Aromatic plant based products from translational research at CSIR-CIMAP

This session was taken by Senior Principal Scientist, Dr Anirban Pal, who discussed on how essential oils obtained from medicinal and aromatic crops have antiviral, nematocidal, antifungal, insecticidal, and antioxidant properties. He further explained how



these constituents found in the essential oils were important in making safe and environment friendly products useful for general health and hygiene either on the traditional knowledge or as an output of the research that goes into prospecting newer biologically active molecules. Some of the products which were developed through herbal formulations were classified into different groups like skin and hair care, hands and surface disinfectants, pain relievers, mosquito repellents, nutraceuticals, health and hygiene.

SESSION V: Hands on training of making Incense sticks.

Mrs. Priyanka Singh led this programme in which she educated participants on how incense sticks are made. Flowers, essential oils, and jigat powder (made from *Litsea glutinosa* bark) were provided as the basic materials needed. This lesson demonstrated how to gather and separate flowers, blend powdered flower petals with jigat powder, and roll incense before dipping it in essential oils or other fragrances. After watching a demonstration of how the combination was made, the participants engaged in hands-on training, which they found enjoyable and expressed an interest in continuing.

DAY-2

SESSION I: Processing and Value addition of aromatic plants for herbal products.

The days first session was led by Chief Scientist Dr. Sandeep Tandon, who discussed how different industries and purchasers have specific standards when buying essential oils from manufacturers. Colour, odour, the presence of moisture, and the presence of particle contaminants were some of the elements that affected the essential oils quality. Poor planting material, storage of the oils in plastic drums, agro-climatic conditions, post-harvest techniques, distillation processes, clean sanitary practises, and adulteration were the most common factors that could alter the quality of the oils. Additionally, he discussed how essential oil components after column segregation were to obtain the intended commercial output.



SESSION II: Lecture on FloMop (Floor disinfectant) and Mos-EX (Mosquito Repellent Lotion).

Dr. Aniban Pal, Senior Principal Scientist, gave a talk on the manufacturing process for floor cleaner and insect repellent. This presentation focused on how farmers and clusters might easily produce these goods to improve the community utilising essential oils that were distilled from medicinal and aromatic plants. The plant based formulations taught the participants how to manufacture Mos-EX, a lotion to ward off mosquitoes, and Flo Mop, a floor disinfectant, two necessities for a sanitary and comfortable living space. These goods are not only affordable but also secure and environmentally friendly.

SESSION III: Hands-on training of making FloMop (Floor disinfectant) and Mos-EX (Mosquito Repellent Lotion).

Dr. A. Pal, a senior principal scientist, and Mrs. Priyanka Singh spoke during this session. Here, the participants learned how to make floor cleaner and mosquito repellent lotion using plant-based formulations created from essential oils extracted from lemongrass and citronella. Mrs. Priyanka Singh oversaw the in-person training and real interactions.



DAY 3

SESSION I: Analytical techniques in Medicinal and Aromatic Plants and its value-added products.

Dr. R. S. Verma gave a presentation on the elements influencing the quality of the farmers produced essential oils. The External and Internal elements, which were further separated into Natural and Man-made components, were the two main features. He also discussed the analytical ways by which organoleptic (sensory), physio-chemical, and



instrumental approaches could be used to accomplish quality control procedures in various fields. He discussed the various aromatic and medicinal plants grown in India and other nations, each of whose contents had been well studied.

SESSION II: Lecture on making of Aloe vera based Gel/cream.

This lecture was given by Senior Principal Scientist, Dr. N. P. Yadav on how the mucilaginous gel present in aloe vera was the essential excipient that was needed to formulate the gel/cream. The phytoconstituents of the plant were also discussed on how they have antioxidant and medicinal properties. The aloe plant is a cactus plant, so it has more water and ingredients like vitamins, minerals, enzymes, anthraquinones, lignin, saponin, amino acids and salicylic acid.

SESSION III: Production of raw materials for herbal products. Dr. R. S. Sharma, Principal Scientist, presented this presentation on the creation of high-quality planting material of aromatic and medicinal plants. He highlighted that every grower of therapeutic crops requires a nursery. The farmers were educated on how to gather, store, manage, package, and use therapeutic plants to their fullest advantage. He also spoke on site selection, packaging, and storage, as well as harvest and post-harvest management. The discussion also explored the various medicinal and aromatic crops economics.

SESSION IV: Hands-on training of Aloe vera based Gel/cream.

This workshop, which was directed by Dr. N. P. Yadav, trained participants on the production of aloe vera gel. He explained to the participants how precise constituent formulas were essential for creating a successful mix that would produce the desired result. The participants took part in hands-on training after viewing a demonstration of how the combination was formed, which they found to be motivating and intriguing.



DAY 4

SESSION I: Industry Visit

One-day industry visit organized by CSIR-CIMAP to M/s Vyom Organic Pvt. Lucknow and M/s Ashri Natural Pvt. Barabanki (UP) Ltd. is led by Mr. D P Mindala, Mr. Manoj K Yadav and Mr. Deepak Verma, where the participants learn about specific



machines involved in the production of different products such as creams, gels and creams, as well as the prices and economics of different essential oils from different medicinal and aromatic plants.

SESSION II: Experienced Sharing and feedback of training program.

This session was arranged to address the inquiries and uncertainties of certain participants, providing an interactive platform for questions and discussions. The focus of this session was on the cultivation and marketing procedures for medicinal and aromatic plants and related products. The participants, particularly the farmers, expressed their interest in revisiting CIMAP Lucknow and requested the organization of additional training programs like this in the future.



SESSION III: Valedictory function and certificate distribution program.

In a formal concluding meeting, CIMAP scientists extended their appreciation to the state officials and the Nodal Farmers of Meghalaya government and to the Institute of Natural Resources. They expressed their gratitude by presenting Dr. Hygina Siangbood, Mr. Pakai-yo Suja, and Ms. Bhalang Kamar with Herbal kits from CIMAP. As the session wrapped up, certificates were awarded to all the participants, and Dr. R K Srivastava, Senior Principal Scientist at CIMAP, concluded the Entrepreneurship and Skill Development Training Programme, delivering a vote of thanks.

Aknowledgement:

The Institute of Natural Resources, Meghalaya would like to express its sincere gratitude and appreciation to the Council of Scientific and Industrial Research-Central Institute of Medicinal and Aromatic Plants (CSIR-CIMAP) for their invaluable support and contribution to the entrepreneurship and skill development training. Throughout the course of the training, CSIR-CIMAP have been instrumental in providing our nodal farmers and entrepreneurs with a comprehensive and enriching learning experience. Their commitment to fostering entrepreneurial spirit and nurturing essential skills has played a pivotal role in shaping our professional journey. We extend our heartfelt thanks to the faculty members and trainers who diligently imparted their expertise and knowledge, equipping us with the necessary tools and insights. The hands-on practical sessions, interactive workshops, and industry-oriented exposure have been truly transformative, enabling us to harness our potential and embrace innovation.

PARTICIPANTS LIST

SI No	Name of the trainee	District	Contact No
1	Ms. Lousia Sangma	South West Garo Hills	9362179803
2	Ms. Aileen Leisiabi K Sangma	South West Garo Hills	8610772728
3	Mr. Pillison D Sangma	South West Garo Hills	8837213876
4	Mr. Klobin D Shira	South West Garo Hills	6009525173
5	Ms. Laxmina Ch Marak	South West Garo Hills	7636803150
6	Ms. Luse G Sangma	South West Garo Hills	9395252246
7	Ms. Kerlang Sayoo	West Jaintia Hills	9366660790
8	Ms. Deimonmi S Mannar	West Jaintia Hills	8414823775
9	Ms. Midpersia Lapasam	West Jaintia Hills	8787807320
10	Ms. Thaitlangki Sayoo	West Jaintia Hills	6909534781
11	Ms. Janailin Marbangiang	East Khasi Hills	7629906593
12	Ms. Banrilang Sohlang	East Khasi Hills	7629906593
13	Mr. Damutskhem Kharsyntiew	East Khasi Hills	6033095945
14	Mr. Willson Lyngkhoi	West Khasi Hills	9485119963
15	Ms. Nishwa Kanai	East Jaintia Hills	9863250853
16	Ms. Sakaia Shadap	East Jaintia Hills	9366965955
17	Ms. Sumarlang Thawmuit	Ri-Bhoi	6009682084
18	Ms. Ibahunlang Majaw	Ri-Bhoi	8575791174
19	Ms. Wanrihun Suting	Ri-Bhoi	8415917349
20	Ms. Pharpa Sylliang	Ri-Bhoi	9366938881
21	Ms. Bhalang Kamar	West Jaintia Hills	7005601937
22	Mr. Victor M Marak	West Garo Hills	8449258431
23	Mr. Paka I Yo Suja	East Khasi Hills	7005847148
24	Mr. Rishotskhem Kharkongor	East Khasi Hills	8415939860

Participants Feedback:

Ms Janailin Marbanging & Ms Banrilang Sohlang (Iaiminot SHG)

We, the farmers who recently took part in the technical training on entrepreneurship and skill development, would like to thank you for the opportunity and offer our thoughts on the programme. Out of all the training programmes available, we would prefer to pursue the production of incense sticks because it does not require for expensive machinery or equipment. We humbly request that the INR grant us a drying apparatus for the flowers so that we can produce our own incense sticks because during the monsoon season we have more flowering plants.



Ms Sumarlang Thawmuit & Ms Ibahunlang Majaw (Persara SHG)

We, the farmers who recently participated in the technical training on entrepreneurship and skill development, would like to express our gratitude and share our feedback regarding the program. We would want to pursue the manufacture of incense sticks out of all the trainings offered because it does not require the costly machinery equipment. Since we have more flowering plants during the monsoon, we respectfully ask the INR to kindly give us a drying equipment for the flowers so we can create our own brand of incense sticks.



Ms Nishwa Kanai & Ms Sakaia Shadap (Narwan co-operative society)

We the farmers, who recently took part in the technical training focused on entrepreneurship and skill development, we would like to extend our heartfelt appreciation and provide feedback on the program. We are particularly inspired by the training and have decided to venture into the production of incense sticks as our first endeavour. Subsequently, we aim to expand into the production of floor mops and mosquito repellent cream. Given the abundance of flowering plants during the monsoon season, we humbly request the assistance of INR in acquiring drying and grinding equipment. With this equipment, we can efficiently process the dried flowers ourselves and create our own high-quality incense sticks.



Ms Wanrihun Suting & Ms Pharpa Sylliang (Kyllumlang VO)

We, the farmers who recently participated in the technical training on entrepreneurship and skill development, extend our heartfelt gratitude for providing us with this opportunity. The training has inspired us to venture into the production of incense sticks as a promising business opportunity, as it requires minimal equipment and the raw materials, i.e., flowers, are readily available in our area. To effectively capitalize on this opportunity, we kindly request the assistance of the INR in obtaining a drying and grinding apparatus for the flowers. This equipment would enable us to process the flowers and produce our own incense sticks efficiently.



Ms Bhalang Kamar (Block Technical Assistant)

By providing our Farmers with training in skill development for value addition, we can help them build sustainable livelihoods using the raw materials from their own villages. Agriculture is the backbone of the economy, and thanks to the machinery at our disposal, we can produce various goods according to consumer wants. Through this training, we gained an understanding of the importance of crop diversification for the self-sufficient and sustainable expansion of the agricultural ecosystem.



Mr Paka I Yo Suja (INR)

The value addition training at CSIR CIMAP Lucknow promises to be well-rounded, covering a variety of tasks such as producing incense sticks, floor mop, insect repellent, and aloe vera gel. The numerous types of FDUs that can be utilized for distilling different kinds of medicinal and aromatic plants are the main focus. One of the best lessons we were taught was how to choose raw materials well. The participants will acquire valuable skills and information thanks to this training. Overall, the training appears valuable and pertinent to improving value addition in various products. I am optimistic that INR continues on its excellent work.



Ms Midpersia Lapasam & Ms Thaitlangki Sayoo (Mynska VEC)

We would like to express our sincere gratitude for providing us with the 4-day training on entrepreneurship and skill development. As farmers, we have learned a great deal about technical methods for working with aromatic plants and the oils they produce. We gained practical knowledge on how to use these essential oils to enhance the value of products. We would like to see more of these kinds of opportunities so that future farmers can support their communities.



Ms Kerlang Sayoo & Ms Deimonmi S Mannar (Khliehrangnah VEC)

We extend our heartfelt appreciation for the 4-day training program on entrepreneurship and skill development. As farmers, we are incredibly grateful for the valuable insights we have gained regarding the technical aspects of working with aromatic plants and their oils. This training has equipped us with practical knowledge on utilizing essential oils to enhance the value of our products. We sincerely hope that more of these opportunities will be made available in the future, as they have the potential to greatly benefit upcoming farmers and contribute to the overall development of our communities. Thank you once again for this enriching experience.



Mr Pillison D Sangma & Mr Klobin D Shira (Dondima IVCS)

We would like to express our sincere gratitude for the 4-day programme on entrepreneurship and skill development. We are immensely appreciative as farmers for the insightful knowledge we have learned about the technical facets of working with aromatic plants and their oils. We now have real understanding on how to use essential oils to raise the value of our products thanks to this training.

Since these possibilities have the potential to considerably assist aspiring farmers and contribute to the general growth of our communities, we really hope that more will be made accessible in the future. I want to thank you again for this wonderful experience.



Ms Laxmina Ch Marak & Ms Luse G Sangma (Kharkutta IVCS)

We would like to express our sincere gratitude to the CSIR-CIMAP faculty for their training programme on entrepreneurship and skill development. We are immensely grateful as farmers for the useful information we have learned about the technicalities of working with aromatic plants and their oils. We now have real understanding on how to use essential oils to raise the value of our products thanks to this training. Since these opportunities have the potential to considerably assist aspiring farmers and contribute to the general growth of our communities. We really hope that more will be made accessible in the future.



Mr Rishotskhem Kharkongor (INR)

We would like to express our sincere gratitude to the CSIR-CIMAP faculty for their training programme on entrepreneurship and skill development. We have learned a lot about the technical elements of working with aromatic plants and their oils, and we are really grateful for that. We now have real understanding on how to use essential oils to raise the value of our products thanks to this training. Since these possibilities have the potential to considerably assist aspiring farmers and contribute to the general growth of our communities, we really hope that more will be made accessible in the future.



Mr Victor M Marak (INR)

We would like to sincerely thank the CSIR-CIMAP professors for their training programme on entrepreneurship and skill development as well as the accommodations and meals provided. We are really appreciative of all the technical information we have learnt working with aromatic plants and their oils. Thanks to this training, we now have a thorough understanding of how to use essential oils to increase the value of our products. We sincerely hope that



more opportunities will be made available in the future because they have the potential to significantly help budding farmers and contribute to the overall growth of our communities.

Mr Damutskhem Kharsyntiew (Puin SHG)

We would like to express our sincere gratitude for organising a 4-day training session on skill development and entrepreneurship. As farmers, we are greatly thankful of the helpful information we have learned about the practical elements of working with aromatic plants and their oils. With the help of this training, we now have the ability to use essential oils to raise the value of our products. We sincerely hope that additional opportunities like these will become

accessible in the future because they could be very beneficial to aspiring farmers and help with the general growth of our community. Once more, thank you for this valuable opportunity.



Mr Willson Lyngkhai (Shipara SHG)

We would like to express our deepest gratitude to CSIR-CIMAP and its faculties for organising a 4-day training course on entrepreneurship and skill development. We are really thankful as farmers for the useful knowledge we have acquired concerning the practical aspects of working with aromatic plants and their oils. We now have the knowledge and skills necessary to use essential oils to increase the value of our products thanks to this training. We genuinely hope that more chances like these will open up in the future since they may be very helpful to young farmers and contribute to the expansion of our community as a whole.



Ms Lousia Sangma & Ms Aileen Leisiabi K Sangma (Larry Enterprise)

Our utmost gratitude goes to CSIR-CIMAP and its faculties for arranging a comprehensive 4-day training program on entrepreneurship and skill development. As farmers, we are truly appreciative of the invaluable knowledge we have gained, particularly in the practical aspects of handling aromatic plants and their oils. Thanks to this training, we now possess the expertise and skills needed to leverage essential oils and enhance the value of our products. We sincerely hope that more opportunities like these will be made available in the future, as they hold great potential in supporting young farmers and fostering the growth of our community as a whole. Once again, thank you for this enriching experience.

