

# Activities & Achievements



Regional cum Facilitation Centre  
Eastern Region  
National Medicinal Plants Board  
Ministry of AYUSH, Govt. of INDIA  
Jadavpur University, Kolkata

# Preface

India is one of the world's 12 mega diversity centers having rich vegetation with 47,000 plant species distributed over 15 agro-climatic zones. More than 7000 species are estimated to have medicinal usage in traditional medicines. About 1178 species of medicinal plants are estimated to be in trade of which 242 species have annual consumption levels exceeding 100 metric tons per year. However the ever increasing demand on the forests resources for goods and services, the forests are under tremendous pressure and threatening the delicate balance between the availability and utilization. With no exception, the availability of medicinal plants are sharply declining and subsequently, the cultivation of medicinal plants has started gaining momentum.

In order to promote medicinal plants sector, Government of India has set up National Medicinal Plants Board (NMPB) in 2000 which is currently working under the Ministry of AYUSH, Government of India. The primary mandate of NMPB is to develop an appropriate mechanism for coordination between various ministries, departments, organization and implementation of support policies and programs for overall (conservation, cultivation, trade and export) growth of medicinal plants at the state, national and International level.

Jadavpur University is the best State University in India and 5th among all universities in the ranking by the Union Human Resource Development Ministry. The University was rated the 12th best institute "overall" after competing with the cream of the crop that included the IITs, NITs, IIMs and state-aided, centrally-funded and private research institutes. The National Assessment and Accreditation Council (NAAC) has re-accredited the University with the highest grade 'A'. The University has 36 departments grouped under three Faculties - Engineering & Technology; Science, and Arts. Recently a new 'Faculty of Interdisciplinary Studies, Law & Management' has been formed which consists of 22 Interdisciplinary Schools and 43 Centres of Research.

The works details incorporated in this report have been implemented by this RCFC-ER, NMPB, Jadavpur University up to 10th May 2019, since its inception in 2018. The details is also communicated to NMPB in the form of monthly progress reports.

I wish to take this opportunity to thank NMPB for funding and all stakeholders of the region for facilitating successful implementation of the programmes as well as carrying forward the takeaways for overall promotion of medicinal plants sector.

I like to record my sincere thanks to Prof. Suranjan Das, Vice-Chancellor; Dr. P.K. Ghosh, Pro Vice-Chancellor; Dr. Snehamanju Basu, Registrar, Mr. Gour Krishna Pattanayak, Finance Officer, Jadavpur University for their valuable advice and support for our endeavour.

I am sure that this publication would facilitate the NMPB to review the work of RCFC-ER and to set further directives, and enables the RCFC to explore opportunities to flourish. I fervently hope that the information contain in the report will be of immense importance and help to everyone concerned with the medicinal plants sector. Any feedback on this booklet is always welcome so as to improve the future versions.

Prof. Asis Mazumdar  
Nodal Coordinator  
10th May 2019

Dr. Sanjay Bala  
Regional Director



## Brief of Regional Cum Facilitation Centre (RCFC)

Regional-cum-Facilitation Centre (RCFC), Eastern Region, National Medicinal Plants Board (NMPB), Jadavpur University has been established as one of the seven such Centres in different regions (East, West, North-I, North-II, South, Central and North East) of the country under the Ministry of AYUSH, Government of India during 2017-18. This RCFC, NMPB for Eastern Region will act as one stop center for the growers, cultivators, researchers, traders and other stakeholders of medicinal plants. The centre caters the state of Bihar, Jharkhand, Odisha and West Bengal and would function in close co-ordination with State Medicinal Plants Board (SMPBs), the State implementing agency of the medicinal plants component of the AYUSH Mission. The RCFC, NMPB is to provide a service window for growers of medicinal plants for supporting conservation, development, marketing, cultivation and provide handholding support to stakeholders in terms of technology dissemination and also for establishing primary processing facilities etc. besides undertaking identified research relevant to the area concerned as and when assigned.

### The major functions of the RCFC, NMPB are:

- To act as multifaceted facilitating arm of NMPB
- Development of Quality Planting Materials (QPM)
- Development of Agrotechnology of medicinal plants
- Setting up of primary processing, grading, marketing facilities
- To develop managerial and technical skill among the stakeholders
- Facilitation of sale of medicinal plants and produces
- To provide inputs on conservation, sustainable cultivation, technology upgradation, training & research
- Domestication of wild species in demand
- To function as a platform for bringing together the different stakeholders
- To organize periodical meetings, workshops, consultation of stakeholders
- To review of the projects sanctioned by NMPB to various organizations
- To collect and maintain database of all concerned Sectors of the Medicinal Plants in the states and Integration of database of various States of the region concerned.
- To develop strategy for Information, Education and Communication (IEC) and its implementation.
- To document and disseminate success stories of activities supported by NMPB.



# Contents

A. Workshops	1
B. Training Programmes	7
C. Exposer Visits	13
D. QPM (Quality Planting Material)	17
E. Research Works	23
F. Meetings / Inter-State Visits	29
G. Marketing	31
H. Success Stories	33
I. Publication/Awareness	37
J. Others	43



# A. Workshops

## Workshop - I

“Stakeholders’ Meet on Medicinal Plants”  
for Eastern Region

10th May, 2018

at Dr. K.P. Basu Memorial Hall  
of Jadavpur University, Kolkata

### Objective:

The main objective of the programme was to bring all stakeholders of medicinal plants in one platform, in depth understanding of medicinal plants sector in the region, and decide over future course of action related to conservation and development of medicinal plants in the region.

### Number & Composition of Participants

Total – 68 nos. Stakeholders from the state of Jharkhand, Odisha and West Bengal were participated, including State Medicinal Plants Boards, Forest Department, Horticulture Department, Farmers, Traders, Traditional Healers, NGOs, Research Institutions, Academicians and Industry representatives.

### Resource Persons

Swami Vasavananda, Ramkrishna Mission Ashram, Narendrapur, West Bengal; Dr. A.S. Verma, Pro-Vice-Chancellor, Jadavpur University; Shri S.P. Mohapatra, IFS, Addl. Principal Chief Conservator of Forests & Chief Executive Officer, State Medicinal Plants Board, Odisha, Bhubaneswar; Dr. Sangeeta Dubey, IFS, Addl. Principal Chief Conservator of Forests (Research & Monitoring), Government of West Bengal, Kolkata; Smt. Shomita Biswas, IFS, Chief Executive Officer, National Medicinal Plants Board, Ministry of AYUSH, Government of India, New Delhi; Dr. N. Padma Kumar, Assistant Advisor, Botany, National Medicinal Plants Board, Ministry of AYUSH, Government of India, New Delhi; Dr. Prasanta Kumar Sarkar, Director & Nodal Officer, State Medicinal Plants Board, Bhubaneswar, Odisha; Shri Debanshu Mallick, IFS, Conservator of Forests, RM&D, West Bengal; Dr. B. Pradhan, Dy. Director, Directorate of Horticulture, Government of Odisha, Bhubaneswar; Ms. Mamta Priyadarshi, IFS, DFO- Deoghar, Jharkhand; Mr. A.K. Shrivastawa, JFS, DFO-WFP, Chaibasa, Jharkhand, Chaibasa; Dr. S.K. Gupta, Consultant Scientist, Medicinal plants Research & Extension Centre, RK Mission, Narendrapur; Dr. Biswajit Ghosh, Department of Botany, Ramakrishna Mission Vivekananda Centenary College, Rahara, Kolkata; Dr. Ramesh Uniyal, Head, Bio-resources Development, Emami Ltd; Prof. C. Bhattacharjee, Registrar (acting) & Dean, FET, Jadavpur University; Prof. Samita Sen, Dean, FISLM, Jadavpur University; Prof. Asis Mazumdar, Nodal Coordinator, RCFC, Eastern Region, NMPB, Jadavpur University; Dr. Pulok K. Mukherjee, Director, SNPS, Jadavpur University

### Description

The workshop created a common platform for all stakeholders in the eastern region to discuss about the present status as well as in depth understanding of medicinal plants sector in the region, and consensus over future course of action related to cultivation, conservation and development of medicinal plants in the eastern region. The purpose of establishing the RCFCs across India and in particular to eastern region has been explained by Smt. Shomita Biswas, IFS, CEO, NMPB, Ministry of AYUSH, Govt. of India. She also enlightened the available Govt. schemes which may help different stakeholders. The entire programme has been covered under four major category viz. Conservation, Cultivation, Value addition and Marketing of Medicinal plants. The resource persons explained the major components putting emphasis to prepare state wise road map with a blend of regional approach. Further emphasis has been given to promote certification systems – organic certification, GMP certification etc. and also the online marketing portal e-charak.

### Outcomes/Recommendations

Multi-dimensional discussion enhanced the knowledge base of the participants and they will follow the same methods for continuing or further upgradation of Conservation, Cultivation, Value addition and Marketing of Medicinal plants. They become aware about the schemes, planning, techniques and their responsibility and they will be practicing the same. The linkages were established amongst the various players in the sector in eastern region. As the medicinal plants are declining from the natural forests, the message was forecasted for the promotion of cultivation in the demanded medicinal plants which are suitable for agro-climatic condition of eastern region.



## Workshops - II

### “Stakeholders' Workshop on Medicinal Plants” in Odisha

31st July, 2018  
at Hotel Kalinga Ashoka of  
Bhubaneswar, Odisha.

#### Objective:

The main objective of the programme was to bring all medicinal plants stakeholders of Odisha in one platform, in depth understanding of medicinal plants sector in the state, and discuss over future course of action related to conservation and development of medicinal plants in the state.

#### Number & Composition of Participants

Total – 135 nos. Stakeholders from the state of Odisha were participated, including State Medicinal Plant Board, Forest Department, Horticulture Department, Farmers, Traders, NGOs, Traditional Healers, Research Institutions, Academicians and Industry representatives.

#### Resource Persons

Dr. Debabrata Swain, IFS, PCCF & HoFF, Department of Forests, Govt. of Odisha; Smt. R. Nayar, IFS, PCCF & Chief Executive, RPRC, Govt. of Odisha; Shri S.P. Mohapatra, IFS, Addl. PCCF cum CEO of SMPB, Odisha; Shri S. M. Samal, IAS, Director of Directorate of Horticulture, Govt. of Odisha; Dr. A.K. Pathak, IFS, Addl. PCCF (PPA), Department of Forests, Govt. of Odisha; Smt. Padmapriya Balakrishnan, IFS, Dy. CEO, National Medicinal Plants Board, Ministry of AYUSH, Govt. of India; Shri A. Mishra, IAS, Director, Directorate of AYUSH, Govt. of Odisha; Dr. P. K. Sarkar, Director & Nodal Officer of SMPB, West Bengal; Dr. U.C. Basak & Dr. S. Bhatnagar of Regional Plant Resource Centre, Govt. of Odisha; Prof. Dr. Malay Mishra, Former HOD, Department of Botany, Berhampur University, Odisha and Dr. S.C. Swain, Associate Professor (Hort.), Department of Botany, Odisha University of Agriculture & Technology, Odisha were the other notable distinguished dignitaries.

#### Description

The workshop created a common platform for all stakeholders of Odisha state to discuss about the present status as well as in depth understanding of medicinal plants sector in the state, and decide over future course of action related to cultivation, conservation and development of medicinal plants in the state. The purpose of establishing the RCFCs across India and in particular to eastern region has been explained by Smt. Padmapriya Balakrishnan, IFS, Dy. CEO, National Medicinal Plants Board, Ministry of AYUSH, Govt. of India. She also enlightened the available Govt. schemes which may help the different stakeholders. The entire programme has been covered under four major category viz. Conservation, Cultivation, Value addition and Marketing of Medicinal plants. The resource persons explained the major components putting emphasis for the preparation of state road map for Odisha by considering the view of all players in this sector.

#### Outcomes/Recommendations

Multi-dimensional discussion enhanced the knowledge base of the participants and the participants will concentrate on Conservation, Cultivation, Value addition and Marketing of Medicinal plants by making informed decision. They become aware about the schemes, planning, techniques and their responsibility and they will be practicing the same. The stakeholders were working in isolation and they were unfamiliar with each other regarding their activities in this sector. This workshop has created a benchmark for creating network amongst all stakeholders and led towards collaborative or group level approach for the promotion of medicinal plants sector.



## Workshops-III

### Regional Workshop cum Buyer-Seller Meet on Medicinal Plants

25th April, 2019  
at Gandhi Bhawan,  
of Jadavpur University, Kolkata.



#### Objective :

The main objective of the programme was to strengthen the linkage among all stakeholders of medicinal plants, in depth understanding of medicinal plants sector, and improvement of value chain by facilitating the network building amongst producers, FPOs, NGOs, Researchers, Traders and Industry for the overall improvement of medicinal plants sector in the region.

#### Number & Composition of Participants :

Total - 338 nos. Stakeholders from the state of Bihar, Jharkhand, Odisha & West Bengal were participated, including SMPBs, Forest Department, Horticulture Department, Farmers, Traders, NGOs, Traditional healers, Research Institutions, Academicians and Industry representatives.

#### Resource Persons :

Prof. Suranjan Das, Vice-Chancellor, Jadavpur University; Prof. P.K. Ghosh, Pro Vice-Chancellor, Jadavpur University; Prof. Chiranajib Bhattacharya, Dean, FET, JU; Dr. N. Padma Kumar, Asst. Advisor (Botany), NMPB, Ministry of AYUSH, Govt. of India; Dr. A.K. Pathak, IFS, APCCF (PP&A), Department of Forests, Govt. of Odisha; Shri Arvinder Singh, IFS, CCF & CEO, SMPB, Bihar; Prof. Asis Mazumdar, Nodal Coordinator, Regional-cum-Facilitation Centre, NMPB, Jadavpur University; Dr. Prasanta Sarkar, Director & Nodal Officer, SMPB; Shri S.K. Das, Entrepreneur & Adjunct Professor, Centurion University, Bhubaneswar; Shri Krishna Prasad, President, Medicinal Plants Growers Association of Bihar; Shri Shantanu Chakraborty, Technical Director, Janus Life Sciences, Kolkata; Dr. Rajpal, Managing Director, Sindhu Organic Farm, Haryana; Dr. Biswajit Ghosh, Associate Professor, RKMVC College, Rahara; Mr. Nirmal Awasti, President, Traditional Healers Association, Chhattisgarh; Mr. Abhijit Ghosh, Chairman, NEPO, Nadia; Mr. Avishek Paul, Entrepreneur, Kalyani; Md. Giasuddin Mondal, Entrepreneur, Bankura; Mr. Pinak Dan, Kalpatatu, South 24 pgs.; Mr. Bidhan Sarkar, Kataganj Spandan, Kalyani, WB; Mr. Arjun Vishwakarma, WeGrow, Jharkhand; Mr. Sudhir Prasad, Bihar; Vaidraj Sukhlal, Jharkhand, Mr. Bibhuti Bhushan Mund, Odisha; Mr. Debi-prosad Chakraborty, Ayursathi Ayurveda India Pvt Ltd; Mr. Sandeepan Sharma, Lama Pharmaceuticals; Mr. Nirmal Saha, Emami Pvt. Ltd.; Mr. Biren Sarkar, Parker & Robinsons; Ms. Oeandriila Banerjee, Soumi's Herbal Products Pvt. Ltd.; Mr. Ashok Agarwal, Axil Natural India LLP; Mr. Srinivas Rao, Botanical Resources India Pvt. Ltd.; Mr. Ramesh M. Pillai, Srinivas Herbs Private Limited.

#### Description :

The whole day compact programme runs 2 hours more than the scheduled programme duration with full hearted support from the participants. The in-house programme was comprised of two technical sessions and two plenary sessions whereas one outdoor visit to installed canopies/stalls occupied by four eastern states SMPBs and private organizations with raw to finished products and a special visit to Modern Nursery established for the production of Quality Planting Material (QPM) was made where distribution of seedlings of medicinal plants species to the participants was a major attraction.

In technical sessions, intervention by the individual states of Bihar, Jharkhand, Odisha and West Bengal were presented by State Medicinal Plants Board and State Forest Departments. The discussions incorporated on Training to cultivators, involvement of local Universities for value addition, production of QPM, marketing facilities to JFMC members, storage go-down, semi processing units and drying floors, Collection and marketing of important Medicinal Plants within forest area, Buy-back agreement with manufacturing units, Contract farming and Tie up with the manufacturers for marketing. The MPCAs established in different agro-ecological regions of West Bengal i.e. Darjeeling Hills, Terai of North Bengal, Lateritic zone of South Bengal, Gangetic Plains and Sundarbans Mangrove were briefed.

The plenary sessions were designed so as to cover all trade related issues, the producers point of view were raised by the FPOs, NGOs and small traders in the sector where industry representatives mentioned about their specific demands of major medicinal plants, quality requirement and quantity issues, supply round the year or as per the requirement etc. The representation of a good number of traders and industry representative was a major success of the programme.

#### Outcomes/Recommendations :

Multi-dimensional discussion enhanced the knowledge base of the participants and everyone experience the whole spectrum of issues related to Conservation, Cultivation, Value

addition and Marketing of Medicinal plants. The information gathered in the programme would help them to take well informed decision for production or business.

The focus should be shifted on cultivation of Medicinal Plants, as the maximum amount is collected from the forest area available to the States, namely, Jharkhand, Bihar, Odisha and West Bengal. There is also a demand of proper management of medicinal plants from the point of collection, farming, marketing and value chain management to get the maximum benefit to the farmers with the active involvement of different agencies like State Medicinal Plants Board, Forest Department, as well as online marketing hub like e-Charak. Also there is an indication in the shift from cultivation to well managed cultivation with proper certification for value generation along with interest in value addition in different stages from cultivation, transportation and final production of medicinal plants goods. A reasonable advancement of the medicinal plants network of stakeholders was perceived.

It is further agreed that to increase medicinal plants market, there is huge requirement in infrastructure creation and up-gradation of the available ones. All the participants appreciated the efforts of RCFC Eastern Region under NMPB to take up this workshop cum interaction sessions and demanded for more such activities in future to raise awareness and knowledge base of all stakeholders.



# B. Training Programmes

## Training - I

One day Training Programme on Good Agriculture Practices for Cultivation of Medicinal Plants in Odisha

1st August 2018

at Conference Hall, CYSD, Bhubaneswar, Odisha

### Objective

The main objective of the programme was to motivate towards cultivation of Medicinal Plants and extension of knowledge to farmers for Good Agriculture Practices applicable for the medicinal plants which is having potential to grow in the state.

### Number & Composition of Participants

Total – 71 nos. (SMPBs, Forest Department, Farmers, Traditional Practitioners/Healers, Traders & Entrepreneurs, NGOs, Govt. organizations, Research Institutions, Academicians and Industry representatives)

### Resource Persons

Shri S.P. Mohapatra, IFS, CEO-cum-Member Secretary of SMPB, Odisha; Dr. P.K. Sarkar, Director & Nodal Officer, SMPB, West Bengal; Dr. S.C. Swain, Associate Professor (Hort.), Department of Botany, Odisha University of Agriculture & Technology, Odisha; Dr. S. Bhatnagar, Scientist, Regional Plant Resource Centre, Govt. of Odisha; Shri Harmohan Maharta, Retired Forest Officer & Master trainer of NMPB and Shri S.K. Das, Entrepreneur (Medicinal Plants) & Adjunct Professor, Centurion University.

### Description

The training programme organized for the people those wanted to cultivate medicinal plants or already in practice and wanted further growth and diversification. The programme was a complete package of technical knowledge- how to deal with practical problems, sources of seeds and other quality planting material, storage and marketing, insecticide, modern techniques of cultivation, maintenance etc. All the resource persons described the technical part for cultivation of medicinal plants in details. The potential entrepreneurship options along with the details of training and marketing has been also thoroughly described by the other resource persons to the participants.

### Outcomes/Recommendations

The cultivation of medicinal plants is initiated with the active support of Horticulture Department in Odisha. Though the farmers can easily learn cultivation methods from the fellow farmers, this training provided information regarding good agricultural practises by selecting the right species suitable for agro-climatic region, using quality planting material, usage of organic fertilizer and pesticides, good harvesting practices and immediate post harvest activities to retain and extract the active phyto-constituents in the products.

There was a demand of proper marketing and value chain management to get the maximum benefit to the farmers with the active involvement of different agencies like Tribal Development Co-operative Corporation of Odisha Ltd. (TDCC), Odisha Forest Development Cooperation (OFDC), Odisha Livelihood Mission, Mart as well as online marketing hub like e-Charak, which was also taken into consideration by the experts as well as the RCFC.



## Training - II

### One day Training Programme on Medicinal Plants in Bihar

14th September 2018

at Govt. Ayurvedic College & Hospital, Patna, Bihar

#### Objective

The programme was focused on Post Harvest Management, Primary Processing, Value Addition and Marketing of selected medicinal plants by establishing Farmer Producer Organizations (FPO) of medicinal plants cultivators in Bihar.

#### Number & Composition of Participants

Total – 79 nos. SMPBs, Forest Department, Farmers, Traditional Practitioners/Healers, Directorate of AYUSH, Traders & Entrepreneurs, NGOs, Govt. organizations, Research Institutions, Academicians and Industry representatives.

#### Resource Persons

Shri Arvinder Singh, IFS, CCF & CEO, State Medicinal Plants Board (SMPB), Bihar; Vaidya (Prof.) Dineshwar Prasad, Principal of Govt. Ayurvedic College & Hospital, Kadam Kuan, Patna, Dr. Prasanta Kr. Sarkar, Director & Nodal Officer, SMPB, WB; Mr. Shantanu Chakraborty, Technical Director, Janus Life Sciences, Kolkata; Dr. Kamal Krishna Singh, Sr. Scientist & Head, Agriculture Extension, Farms & Farmers, Patna; Dr. Virendra Singh, Manager (R&D), Baidyanath Ayurved Pvt. Ltd., Patna; Mr. Ajay Kumar Singh, Management Executive, M-CRIL, Patna (Representative of SFAC) and Mr. Krishna Prasad, Secretary, Medicinal & Aromatic Plants Grower's Association, Patna

#### Description

The training programme organized for the progressive farmers already cultivating medicinal plants. The programme was a complete package of technical knowledge of Post Harvest Management, Primary Processing, Value Addition and Marketing of selected medicinal plants e.g. Kalmegh (*Andrographis paniculata*), Mentha (*Mentha arvensis*), Satawar (*Asparagus racemosus*), Ashwagandha (*Withania somnifera*), Stevia (*Stevia spp.*), Safed Musli (*Chlorophytum borivillianum*), Tulsi (*Ocimum tenuiflorum*), Lemon grass (*Cymbopogon flexuosus*). All the resource persons described the technical part. Schemes and programmes of Government also discussed. Step by step procedure for establishing Farmer Producer Organizations (FPO) of medicinal plants cultivators in Bihar has also been presented in the programme.

#### Outcomes/Recommendations

The CEO of SMPB, Bihar has concluded the programme by stating that he will take initiative to procure some of the low cost primary processing machineries as described in the programme to support medicinal plants cultivators in the annual action plan of AYUSH Mission. He also emphasized that the marketing of some important medicinal plants will be carried forward by the FPO formation with the already identified farmers clusters in Bihar. A meeting need to be organized with the listed 141 traders of medicinal plants in the State of Bihar regarding their demand of medicinal plants species with associated criteria. Simply by drying the value can be added and self life of medicinal plants can be increased which will also increase the bargaining power of the farmers.



## Training - III

### One day Training Programme for Promotion of Medicinal Plants in Jharkhand

31st January 2019  
at AVN Grand, Ranchi, Jharkhand



## Objective

The main objective of the programme was to motivate and extend the procedures to farmers regarding Good Agriculture Practices for Cultivation of Medicinal Plants as well as knowledge sharing about the Medicinal Plants sector from cultivation to marketing.



## Number & Composition of Participants

Total – 105 nos. SMPBs, Forest Department, Farmers, Traditional Practitioners/Healers, Directorate of AYUSH, Traders & Entrepreneurs, NGOs, Govt. organizations, Research Institutions, Academicians and Industry representatives.

## Resource Persons

Dr. H.S. Gupta, IFS, Principal Chief Conservator of Forests (Research), Department of Environment, Forests & Climate Change, Govt. of Jharkhand, Ranchi; Mr. N. K. Singh, IFS, Addl. Principal Chief Conservator of Forests, Department of Environment, Forests & Climate Change, Govt. of Jharkhand, Dumka; Mr. Sanjay Kumar Suman, IFS, Chief Conservator of Forests, Department of Environment, Forests & Climate Change, Govt. of Jharkhand, Ranchi; Smt. Padmapriya Balakrishnan, IFS, Deputy Chief Executive Officer, National Medicinal Plants Board, Ministry of AYUSH, Govt. of India, New Delhi; Dr. N. Padma Kumar, Assistant Advisor (Botany), National Medicinal Plants Board, Ministry of AYUSH, Govt. of India, New Delhi; Dr. Mira Chaudhary, Director in Charge, Directorate of AYUSH, Govt. of Jharkhand, Ranchi; Dr. Ramesh Uniyal, Head, Biore-sources Development, Emami Ltd., Kolkata; Mr. Shantanu Chakraborty, Technical Director, Janus Life Sciences, Kolkata; Prof. M.S. Malik, Faculty of Forestry, Birsa Agricultural University, Ranchi; Mr. Krishna Prasad, Entrepreneur (Medicinal Plants) & President, Medicinal Plants Growers Association of Bihar; Mr. S.K. Das, Entrepreneur (Medicinal Plants) & Adjunct Professor, Centurion University and Mr. Avinash Kumar, Director, Mitratulya Samadhan Seva Pvt. Ltd.

## Description

The training programme was attended by the people who wanted to cultivate medicinal plants or already practicing cultivation. The detailed programmes and schemes of medicinal plants were discussed in detailed by the NMPB officials. The programme was a complete package of technical knowledge regarding dealing with practical problems, sources of seeds and other information, storage and marketing, insecticide, modern techniques of cultivation, maintenance etc. All the resource persons described the technical part for cultivation of medicinal plants in details which are being cultivated in West Bengal, Odisha and Bihar. The potential entrepreneurship options along with the details of training and marketing has been also thoroughly described by the other resource persons to the participants.

## Outcomes/Recommendations

The medicinal plants cultivation in Jharkhand is less popular compare to other states in eastern region, the maximum amount is collected from the forest area available to the State. There is a demand of proper management of medicinal plants from the point of collection, farming, marketing and value chain management to get the maximum benefit to the farmers with the active involvement of different agencies like Jharkhand Sate Medicinal Plants Board, Jharkhand Forest Department, as well as online marketing hub like e-Charak.

All the dignitaries on behalf of the Forest Department, Jharkhand has expressed their desire to support sustainable harvesting and help farmers to acquire best planting materials whereas dignitaries from NMPB mentioned their full support through all types of information sharing and support to the SMPB, Jharkhand for fulfilling the mandate of growth in Medicinal Plant sector in an organized manner in Jharkhand.

## Visit - II

Exposure Visit to Chhattisgarh for the progressive farmers of Bihar and Jharkhand

27<sup>th</sup> to 1<sup>st</sup> April 2019

Bilaspur and surrounding districts of Chhattisgarh State

### Purpose

The exposure visits have been organized to learn prevailing agro-practices, primary processing & value addition, and marketing of medicinal plants for Medicinal Plants Cultivators for the progressive farmers of Bihar and Jharkhand.

### Number & Composition of Participants

14 nos. of medicinal plants cultivators from Bihar and Jharkhand guided by Regional Director and Deputy Director of RCFC-ER.

### Description

The programme was well organized with the support from Traditional Healers Association of Chhattisgarh State. The medicinal plant work in Chhattisgarh by State Medicinal Plants Board (Rajya Vanoushadhi Board) and Chhattisgarh MFP Federation of State Forest Department; which include Home herbal garden scheme, cultivation scheme, processing unit, sustainable harvesting, training programmes etc. has been briefed by Vaidya Nirmal Kumar Awasthi, State Secretary of Traditional Healers Association. The participants gathered experience by visiting the cultivation area of Mr. Janki

Prasad Pulasth at Village Harammudi, Pali of Korba district.

The participants also visited to Godhi Block Kaltara District Korba at 60 acre cultivation area of farmer Vishnu Kashyap and Samar Singh of 6 species Satver, Padal, Sevnak, Bel, Gandhari supported under WADI project of NABARD and by-back support from Dabur limited.

They also visited to MPCA Amadob kewachi of Pendra road forest Range under Marwahi forest Division and Sanjibani, the Mart for selling NWFP and Herbal Product at Pendra road supported and accredited by State MFP Federation to develop their Marketing exposure.

The participants have strengthened their knowledge by visiting Nishtha Herbal processing unit in Balko Range Office of Korba Forest Division supported by SMPB, Raipur. This unit is being running by Sarojani Grahmin Vikas Mahila Sansthan, Balko (President- Miss Sarojani Goyal). This unit has 18 herbal products with GMP Norms and registered by

Department of AYUSH and State forest nursery at Kanan pendari, Bilaspur.

### Outcomes/Recommendations

The participants got first hand information about the techniques cultivation, value addition and marketing of medicinal plants and to enhance their understanding on medicinal plants based Enterprise development. The participants of Bihar were motivated by the information received and they planned for replication of production unit and their management by the local level organization. The Jharkhand team was motivated to take up cultivation in the state along with establishment of primary processing unit and state level organizations for making business from this sector which is underutilized. Both the states will also explore the initial funding for promoting cultivation in the states. More such exposure is needed for the medicinal plants cultivators to learn the best practices for utilization of NTFP and medicinal plants which will encourage them to adopt this concept in their respective States.



# C. Exposure Visits

## Visit - I

Exposure Visit to Chhattisgarh for the progressive farmers of Odisha and West Bengal

24th to 29th March 2019  
Bilaspur and surrounding districts of Chhattisgarh State

### Purpose

The exposure visits have been organized to learn prevailing agro-practices, primary processing & value addition, and marketing of medicinal plants for Medicinal Plants Cultivators for the progressive farmers of Odisha and West Bengal.

### Number & Composition of Participants

11 nos. of medicinal plants cultivators from Odisha and West Bengal guided by Regional Director and Deputy Director of RCFC-ER.

### Description

The programme was well organized with the support from Traditional Healers Association of Chhattisgarh State. The medicinal plant work in Chhattisgarh by State Medicinal Plants Board (Rajya Vanoushadhi Board) and Chhattisgarh MFP Federation of State Forest Department; which include Home herbal garden scheme, cultivation scheme, processing unit, sustainable harvesting, training programmes etc. has been briefed by Vaidya Nirmal Kumar Awasthi, State

The participants gathered experience by visiting the cultivation area of Mr. Janki Prasad Pulasth at Village Harammudi, Pali of Korba district. The Donganala herbal manufacturing unit running by SHG (Hari-bol Swasahayta samooh, Secretary Smt. Saroj Bai) was visited to have a live experience on processing of natural herbs/shrubs. The unit was promoted by Chhattisgarh MFP Federation.

The participants also visited to Godhi Block-Kaltara, District- Korba at 60 acre cultivation area of farmer Vishnu Kashyap and Samar Singh of 6 species Staver, Padal, Sevnak, Bel, Gandhari supported under WADI project of NABARD and buy-back support from Dabur Limited.

The participants have strengthened their knowledge by visiting Nishtha Herbal processing unit in Balko Range Office of Korba Forest Division supported by SMPB, Raipur. This unit is being running by Sarojani Grahmin Vikas Mahila Sansthan, Balko (President- Miss Sarojani Goyal). This unit has 18 herbal products with GMP Norms and registered by Department of AYUSH and State forest nursery at Kanan pendari, Bilaspur.

The participants were also taken Sanjibani, the Mart for selling NWFP and Herbal Product at Bilaspur supported and accredited by State MFP Federation to develop their Marketing exposure.

### Outcomes/Recommendations

The participants got first hand information about the techniques of cultivation, value addition and marketing of medicinal plants and to enhance their understanding on medicinal plants based Enterprise development. The participants of West Bengal were motivated by the information booklets and processing unit and immediately they have produced brochure for herbal garden and planned for packaging of processed products with potential usage tag. The Odisha team was called by the APCCF and they have a detailed meeting with Forest Secretary, PCCF & HoFF, SMPB and other officials to decide over further course of action for the promotion of medicinal plants in the state of Odisha. More such exposure is needed for the medicinal plants cultivators to learn the best practices for utilization of NTFP and medicinal plants which will encourage them to adopt this concept in their respective States.





## D. QPM (Quality Planting Material)

Quality Planting Materials (QPM) were raised in multiple location and engaging various organizations in the state of Bihar, Odisha and West Bengal. The details are as below:

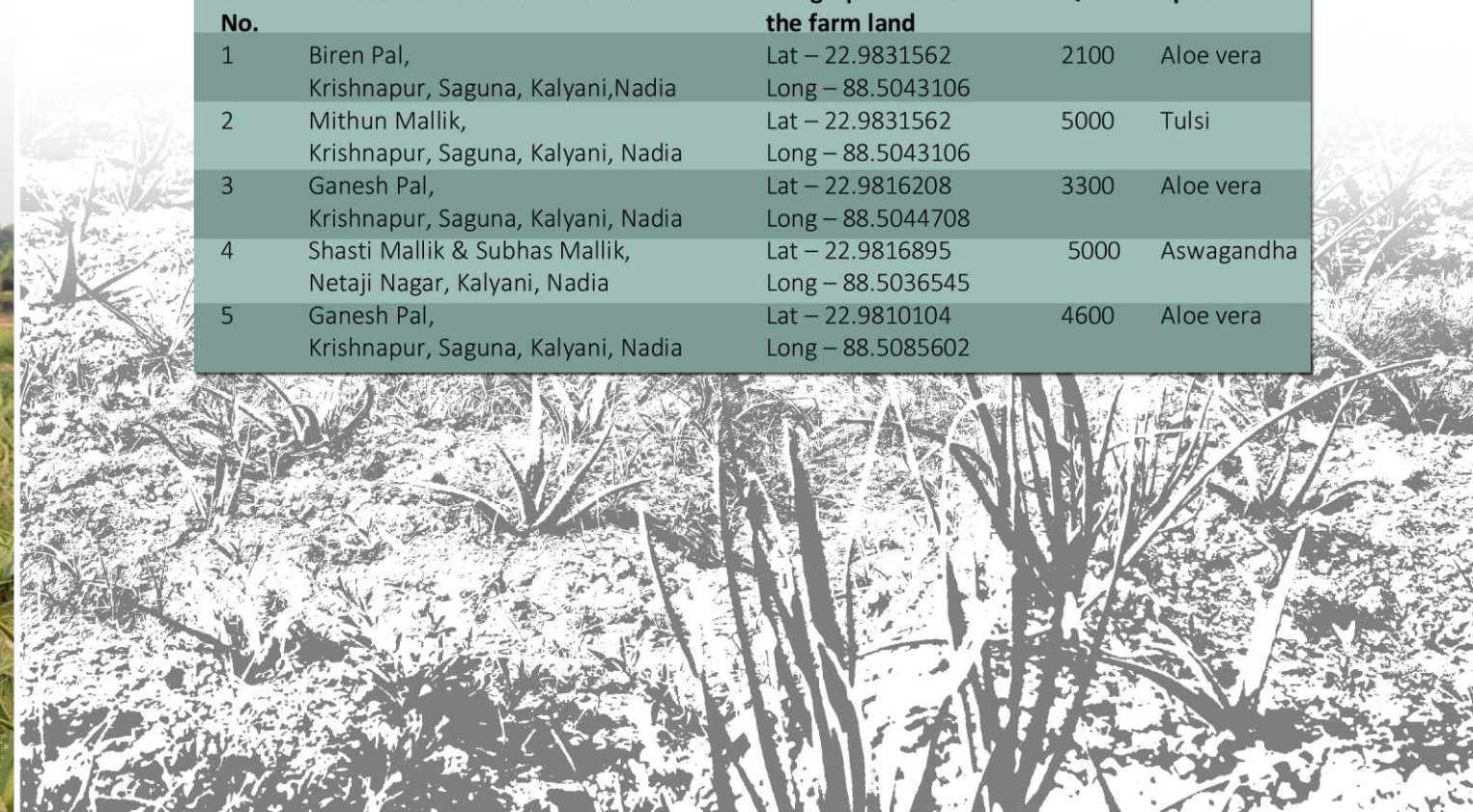
- 10,000 QPM were raised under technical supervision of Midnapore Forest Division at Midnapore, West Bengal
- 20,000 QPM were raised through Medicinal and Aromatic Plant Growers Association of Bihar at Patna, Bihar
- 20,000 QPM were raised through Sabuja Bilav, Bhubaneswar at Ufalgadia, Odisha
- 20,000 QPM were raised through Avi's Enterprise at Krishnapur, Saguna, Kalyani, Nadia, West Bengal
- 30,000 QPM is raised at the Nursery of Jadavpur University Main Campus, West Bengal



### Details of QPM raised and distributed in West Bengal

Avi's Enterprise of Krishnapur, Saguna, Kalyani, Nadia, West Bengal has been given responsibility for raising 20,000 nos. of QPM in which 10,000 is for Aloe vera, 5000 is Tulsi and 5000 is for Aswagandha. Raised QPMs are shared with the farmers whose details mentioned below

Sl. No.	Name of the farmer with Address	Geographic Location of the farm land	QPM	Species
1	Biren Pal, Krishnapur, Saguna, Kalyani, Nadia	Lat – 22.9831562 Long – 88.5043106	2100	Aloe vera
2	Mithun Mallik, Krishnapur, Saguna, Kalyani, Nadia	Lat – 22.9831562 Long – 88.5043106	5000	Tulsi
3	Ganesh Pal, Krishnapur, Saguna, Kalyani, Nadia	Lat – 22.9816208 Long – 88.5044708	3300	Aloe vera
4	Shasti Mallik & Subhas Mallik, Netaji Nagar, Kalyani, Nadia	Lat – 22.9816895 Long – 88.5036545	5000	Aswagandha
5	Ganesh Pal, Krishnapur, Saguna, Kalyani, Nadia	Lat – 22.9810104 Long – 88.5085602	4600	Aloe vera





**The associated details of farmers and QPM:**

Sl. No.	Name of the farmer with Address	Geographic Location of the farm land	QPM	Species
1.	Haripada Mohanta, At – Ufalgodia, P.O. Ufalgadia Mayurbhanj, Odisha – 757022	Lat – 21° 59' 46" Long – 86° 59' 33"	3000	Sarpagandha
2.	Shrihari Malik, At – Salbani, P.O. Baghada GP – Baghada, Dist: Mayurbhanj	Lat – 21° 59' 27" Long – 87° 0' 40"	6000	Sarpagandha
3.	Pravata Kumar Mohanta At – Ufalgodia, P.O. Ufalgodia Block – Suliapada, Dist: Mayurbhanj	Lat – 22° 1' 27" Long – 86° 56' 42"	3000	Sarpagandha
4.	Sanat Kumar Mohanta At – Ufalgodia, P.O. Ufalgadia GP – Baghada, Dist: Mayurbhanj	Lat – 22° 1' 27" Long – 86° 56' 42"	3000	Sarpagandha
5.	Khageswar Das, At – Guhaldiha, P.O. Baghada Block – Suliapada, Dist: Mayurbhanj	Lat – 22° 1' 27" Long – 86° 56' 42"	3000	Lemongrass
6.	Bijaya Kumar Das, At – Guhaldiha, P.O. Baghada Block – Suliapada, Dist: Mayurbhanj	Lat – 21° 59' 44" Long – 86° 59' 24"	1200	Gudmar
7.	Handu Bhakta At- Shalbani, P.O. Baghada Dist: Mayurbhanj, Odisha	Lat – 21° 59' 27" Long – 87° 0' 26"	800	Gudmar

**Details of QPM raised and distributed in Odisha**

Sabuja Bilav, D-30, Green Garden, Kalinga Vihar, Atraada, Bhubaneswar-751019, a NGO of Odisha has been given responsibility for raising 20,000 nos. of QPM in which 15,000 is for Sarpagandha, 3000 is for Lemongrass and 2000 is for Gudmar. Raised QPMs were procured and distributed among the farmers whose details are mentioned in the following page.





Medicinal and Aromatic Plant Growers Association of Bihar, B-83, Ashokpuri, Khajpura, Bailey Road, Patna – 14, a Trust of Bihar has been given responsibility for raising 20,000 nos. of QPM in which 10,000 is for Sarpagandha, and 10,000 is for Satavar. Raised QPMs are distributed among the farmers whose details mentioned below:

Sl. No.	Name of the farmer with Address	Geographic Location of the farm land	QPM	Species
1.	Arvind Kumar Singh, Village - Jalpura, P.O. Masaurtha Dist. - Patna	Lat – 25° 21' 58.7" Long – 84° 46' 01.7"	4000	Sarpagandha – 2000 Satavar – 2000
2.	Ravi Sankar Sharma, Village – Jalpura, P.O. – Masaurtha Dist. - Patna	Lat – 25° 21' 45.3" Long – 84° 46' 01.0"	3000	Sarpagandha – 1500 Satavar – 1500
3.	Nandan Paswan Village - Sonahauli, P.O. Sonahauli Dist: Khagaria	Lat – 25° 17' 25.9" Long – 85° 05' 53.0"	5000	Sarpagandha – 2500 Satavar – 2500
4.	Abhay Kumar Singh Village – Gowanpura, P.O. Phulwari Sarif, Dist: Patna	Lat – 25° 17' 25.9" Long – 85° 05' 53.0"	4000	Sarpagandha – 2000 Satavar – 2000
5.	Arvind Kumar Singh Village – Gowanpura, P.O. Phulwari Sarif, Dist: Patna	Lat – 25° 17' 17.4" Long – 85° 05' 49.3"	4000	Sarpagandha – 2000 Satavar – 2000

### Details of QPM raised and distributed in Bihar



# E. Research Works

## Study - I

### Identification of High Yielding Stevia Cultivars Suitable for Gangetic Alluvial Regions of West Bengal

Steviol glycoside is a 100% natural zero calorie safe sweetener approved by USFDA, EU, JECFA and FSSAI for all including diabetics and children. India has a large domestic market for Stevia based sweeteners for its diabetic, obese and calorie conscious population. Alternative cash crops like Stevia may also be instrumental to achieving the target set by present federal government for doubling the income (inflation adjusted) from farming by the year 2022. Stevia may be an appropriate diversification crop in Gangetic alluvial region of West Bengal with excellent profit potential.

The global average of total steviol glycoside content in dried leaves is 10%-15%. The existing local varieties are low in steviol glycoside content (5%-7% average on dry weight basis) and are thus often unsuitable for extraction.

Though a number of improved high yielding varieties of stevia have been developed and released, these varieties are not suitable for all types of agro-climate. In this scenario, the present study is aimed to identify cultivars optimal for this region by organizing multi-variety adaptive field trials. The project is being jointly organized by Janus Life Sciences and Ramkrishna Mission Ashrama, Sargachhi, District Murshidabad. The project is also being actively supported by RKM Sargachhi Krishi Vigyan Kendra.

#### The objectives of the present study are as follows –

1. Identification of Stevia cultivars suitable with high biomass + TSG yield and low flowering tendency for gangetic alluvial regions of West Bengal through multi-variety field trials.
2. Genetic selection of some exotic varieties through phenotype markers and their adaptation to local conditions.
3. Establishment of a field level plant propagation unit for production of Stevia planting materials with well defined genetic lineage
4. Organization of demonstration trials with identified varieties.
5. Creation of a set-up of distribution of locally adapted high yielding Stevia varieties to local farming clusters

Apart from Stevia variety optimized for Gangetic Alluvial plains of West Bengal – which has high biomass and TSG yield potential and less susceptible to pest/disease and flowering, the project also strives for capacity building of local small and marginal farmers through hands on training in Stevia multiplication and farming.

#### The expected long term outcomes of the project are listed below –

1. Increased farming profitability due to better yield and less pest/disease and flowering incidences and reduction of unpredictability in the farming.
2. Better availability of good quality Stevia dried leaves, which will pave the way of establishment of extraction units and value addition
3. Better utilization of land, irrigation water and other natural resources

*(The study is being conducted by JANUS LIFE SCIENCES, Kolkata in close coordination with RCFC-ER and Ramkrishna Mission Asharam Sargachi)*



#### Achievements so far -

1. 10 different Stevia cultivars have been collected in seed form. One non-flowering variety has also been collected from another commercial plantation in West Bengal technically supported by Janus Life Sciences.
2. A technical person deputed by RKM Sargachhi has been trained in nursery operations.
3. The existing poly-house and shade house facilities have been strengthened and customized for Stevia multiplication.
4. The seeds were sowed in seed trays with local fertile soil as growing medium. The sowing was completed on 20th April, 2019
5. The seed trays were closely monitored and regularly irrigated according to standard protocol
6. According to our latest observation on 9th May, 2019, seeds of all the varieties have been germinated and the germination percentage varied within 65% to 10% in different cultivars.
7. The germinated plants are being monitored for phenotypic differentiation. First round of selection will commence on last week of May, 2019





## Study - II

# Assessment of Active Principle of Medicinal Plants for Recommendation of Cultivation as Quality Plant Materials"

### Introduction:

The *Ocimum* sp. Tulsi oil has high economic value due to the presence of specific substances such as estragol, lineol, linalool, eugenol, methyl cinamato, limonene and geraniol. Essential oils extracted from the plants are in a complex mixture of terpenes, sesquiterpenes, oxygenated derivatives and other aromatic compounds. Essential oil comes from every part of the plant including; leaf, stems, flower, seed, branch, root, additionally essential oil is commonly used in cosmetics, drugs, and perfume.



### Objective

The evaluation of total volatile oil content in different cultivars is essential for assessment of quality of tulsi for mass scale cultivation.

### Materials & methods

The plant material Twigs of Tulsi (*Ocimum sanctum*) were collected (from Kalyani, Nadia, WB) and supplied by RCFC-ER . The extraction was done in an oil distillation apparatus, coupled to a bottom flask of 1000 ml. The leaves were thoroughly washed with water and blot-dried to remove any excess water. 650 g of Tulsi twigs were placed into the extraction flask. The samples were hydro-distilled by passing steam through the samples for five hours. The oil was extracted using petroleum ether 40-60°C. It was then dried using anhydrous Na<sub>2</sub>SO<sub>4</sub> to remove water. The oil was obtained by evaporating out the petroleum ether 40-60°C at 25°C. The oil obtained was stored at -20°C until further analysis.

### Result & Discussion

The extracted essential oil is transparent, pale yellow in colour and has water like viscosity. It has fresh, earthy and minty fragrance. 0.9 ml oil is obtained from 650 g fresh twigs which accounts to be 0.14% (v/w). Different cultivars are being collected and will be evaluated to evaluate and select the elite cultivar(s) which will be recommended for future cultivation.



*(The study is being conducted by RKMVC College, Rahara, Kolkata in close coordination with RCFC-ER)*



## Study - III

### Research study to explore the ethnomedicinal use of *Uraria lagopoides* (Shiv-jata) along with validation of one major use.

#### Introduction

Plants have been used from ancient times to attempt cures from diseases and to relieve physical and mental sufferings. About 85% of the rural population of India utilized wild plants for the treatment of various ailments (Fransworth, 1992; Jain, 1992). Though allopathic drugs have brought a revolution throughout the world but the plant base medicines have its own unique status (Behera, 2006).

*Uraria lagopodioides* (L.) D.C., (Papilionaceae) a trailing perennial herb locally known as Mahadevjata or Shibjata has been selected for its multipurpose use by the local communities around Mayurjharna.

#### Objectives

Exploration of indigenous knowledge on the usage of *U. lagopoides* in the outskirts of Mayurjharna, Jhargram, WB

Scientific validation of the usage through preliminary screening of phytochemicals in leaves and roots of *U. lagopoides* collected from the wild

#### Materials and Methods

Focused Group Discussion (FGD) were carried out by organising several meetings at Kakrajhore, Amlasol, Daldali, Jabola, Jujardhara and Mayurjharna villages for listing common diseases and frequently used medicinal plants by local tribes which include Santhal, Munda and Lodha tribal community. Personal interviews were conducted by exercising semi-structured questionnaire to retrieve inherited knowledge on usage of medicinal plants from the respondents. The emphasis was given to retrieve maximum information regarding the usage of *U. lagopoides* while conducting personal interviews.

Plants of *U. lagopoides* were collected from its natural habitat at Mayurjharna forest. The collected plants were dry cleaned and leaves and roots parts were separated manually. Plant parts were dried under the shed about a month till a constant weight was achieved. Next the dried roots and leaves were grounded mechanically into fine dust to facilitate the extraction process. Both of the samples were divided into two parts to be extracted by using methyl alcohol and aqueous media as solvent.



Alcoholic extraction was carried out with dried powdered leaves and roots of *U. lagopoides* by following Soxhlet extraction method (Harborne, 1998; Yadav and Agarwala, 2011; Ajayi et al., 2017) with minor alteration. Powdered plant material of 100 gm was immersed in 500 mL of 80% methanol and shaken manually with 2 hours interval for 72 hours. Subsequently concentrated extract was separated through controlled evaporation at 30-40°C. In case of aqueous extraction, 8 gm of plant material was mixed with 250 mL of distilled water and concentrate was obtained by deploying same method as above.

#### Results and Discussion

Intensive exploration of *U. lagopoides* affirms that the plant has multipurpose use against various diseases and the whole plant bears healing properties. The potential use of the plant of plant parts include:

Wound healing - the paste of leaves is applied to wounds for recovery.

Anti-inflammatory - the whole plant is used medicinally for relieving swelling. Aqueous and alcoholic extracts of the plants are used to treat intermittent fever, asthma and chest inflammation

Anti-diarrhoea - decoction of the leaves and roots for the treatment of dysentery and diarrhoea.

Abortifacient - an aqueous extract of the leaves has abortifacient properties. On the other hand the paste of roots mixed with milk is given to a pregnant woman as a remedy against miscarriage.

Laxative - the whole plant is consumed to have clear bowl

Aphrodisiac - the whole plant is also consumed to stimulates sexual desire

Others - this plant is used along with other plant to treat rheumatism, bleeding piles, catarrh and scorpion sting

The qualitative tests for both methanolic and aqueous extracts for both roots and leaves were carried out and their respond in various reagents are shown below which indicates the presents of multiple metabolites. The methanolic extract reveals the presence of tannins, alkaloids, glycosides, carbohydrates, flavonoids, steroids, and saponins whereas aqueous extract shows positivity of tannins, glycosides, carbohydrates, flavonoids, and saponins.



Sl. No.	Metabolites	Reagent	Methanolic		Aqueous	
			Root	Leaf	Root	Leaf
1.	Tannins	Ferric chloride	+	+	+	+
		Lead acetate	+	+	+	+
2.	Alkaloids	Wagner's reagent	+	+	-	-
		Dragendorff's reagent	-	-	-	-
		Hager's reagent	-	-	-	-
3.	Glycosides	Modified Bortragar's	-	-	+	+
4.	Carbohydrates	Molisch's test	+	+	+	+
		Fehling's test	-	-	-	-
5.	Flavonoids	Alkaline test	+	+	+	+
6.	Steroids	Salkowski's test	+	+	-	-
7.	Saponins	Lead acetate	+	+	+	+

'+' indicates presence and '-' indicates absence of metabolites in plant material

## F. Meetings/ Inter-State Visits

1. Participated in the review meeting to examine the proposed draft structure of “National Policy of Medicinal Plants on 22nd November, 2017 at New Delhi
2. Participated in First Meeting of all Regional-cum-Facilitation Centres on 14th March, 2018 at New Delhi
3. Organized Stakeholders’ Meeting at Jadavpur University, Kolkata on 10th May, 2018
4. Organized 1st meeting of the Management Committee for the RCFC-ER, NMPB, Jadavpur University at Kolkata
5. Participated in the launch Workshop of RCFC-Southern Region, Kerala on 22nd March, 2018 at KFRI, Peechi
6. Participated in Stakeholders’ Meeting at Goa on 9th April, 2018
7. Participated in the launch Workshop of RCFC-Central Region, Madhya Pradesh on 18th May, 2018 at Jabalpur
8. Participated in One day Workshop on use of e-CHARAK and Voluntary Certification Scheme on 28th June, 2018 at Chandigarh
9. Participated in Second Review Meeting of Regional-cum-Facilitation Centre on 28th June, 2018 at Chandigarh
10. Participated in the Stakeholders Meet-cum-workshop of RCFC-Northern Region II, Jammu & Kashmir on 25th September, 2018
11. Participated in Training of Trainers on "Development of training module and facilitation guide for Good Agricultural Practices and Good Collection Practices for Medicinal plants" at ICAR-DMAPR, Anand, Gujrat from 12 to 16 November 2018
12. Participated in National Conference on Giloe (*Tinospora cordifolia*) on 15th November, 2018 at New Delhi
13. Participated in “Rural Connect Conclave” on Export opportunities of Medicinal Plants in West Bengal organized by Bengal Chamber of Commerce & Industry in association with WBSMPB on 4th December, 2018 at Kolkata
14. Organized One Meeting-cum-Training programme at Kalyani, Nadia, West Bengal for promotion of Medicinal Plants on 27th December, 2018
15. Participated in the National Expo & Workshop on Medicinal Plants with Buyers-Farmers Meet at Guwahati on 11th January, 2019
16. A meeting was organized at RCFC-ER office at Kolkata on 8th February, 2019 where representatives of Ramkrishna Mission Ashram, Sargachi, Mursidabad and Janus Life Sciences were present apart from RCFC officials. The discussion was focussed on the cultivation of high yielding variety of Stevia after the selection of best variety in the experimental plots in Murshidabad. The high biomass+ TSG yield and low flowering tendency species suitable for gangetic alluvial regions of West Bengal will be identified through multi-variety field trials at the premises of Ramakrishna Mission Ashram at Sargachi.
17. Prof. Asis Mazumdar, represented the NMPB and delivered a lecture on "Role of NMPB to harness the potential of medicinal plants sector in India" in Two days National Seminar on “Current Research in Medicinal Plants – Global Trends and Indian Scenario” on March 28-29, 2019 at Dr. B. C. Roy College of Pharmacy and Allied Health Sciences, Bidhan Nagar, Durgapur.



# G. Marketing Initiatives



RCFC ER, has started working towards sustainable marketing initiatives within the designated States of Bihar, Jharkhand, Odisha and West Bengal. Snapshots of some the initiatives have been provided as follows:

- Under initiative of WBSMPB and facilitated by RCFC -ER, NEPO FPO has started selling Ekangi to Mr. Ashok Agarwal, promoter of Edible Agro and Axil Natural India LLP. NEPO FPO collects the same from the farmers and as primary processing initiative NEPO is shorting and packing the dried material.
- Mr. S. S. Sharma of Lama Pharmaceuticals, Kolkata has been connected Mr. Avishek Paul, a Progressive Farmer and Trader of Medicinal Plants for procurement of Aloe vera pulp 500 kg per day. Mr. Avishek Paul will establish a primary processing unit to extract Aloe vera pulp with the guidance and support of RCFC-ER, NMPB.
- RCFC ER initiated preliminary discussion between Dr. Ramesh Uniyal, Head, Bioresources Development from Emami Ltd. and Mr. Krishna Prasad and his team from Medicinal & Aromatic Plant Growers' Association of Bihar. Dr. Uniyal also expressed his interest to increase their supplier base and procure some common one or two items like Amla fruits after proper quality assessment from the Laboratory of Emami Ltd.
- Visited to medicinal plant mandi/marketplace at Kolkata. Discussed with the traders and provided the information regarding e-Charak Platform. The similar initiative has been undertaken at Siliguri and Behrampur. Traders from Kolkata and Behrampur are already inducted with e-Charak user base.
- Dr. Durga Prasad Nanda from Cancer Care, Kolkata will involve in cultivation of medicinal plants in

Midnapore by providing initial funding for the project. Where as members of Mugberia Gangadhar Trust, Midnapore, West Bengal would provide their land for the cultivation and raise awareness in the local area about the benefits of medicinal plants. As primary intervention they are starting with a plantation of 4 bighas of Aloe vera plantation under guidance from RCFC ER.

- Samples of Neem oil produced by the farmers of Nadia District, West Bengal has been sent to Mr. L Ramani Rao, exporter from Secunderabad.
- A good marketing network has been established during the Buyer-seller meet on 25th April 2019 with Mr. Sandeepan Sharma, Lama Pharmaceuticals; Mr. Nirmal Saha, Emami Pvt. Ltd.; Ms. Oeand-rila Banerjee, Soumi's Herbal Products Pvt. Ltd.; Mr. Srinivas Rao, Botanical Resources India Pvt. Ltd.; Mr. Ashok Agarwal, Axil Natural India LLP; and Mr. Ramesh M. Pillai, Srinivas Herbs Private Limited to capture domestic and international market.
- Soumi's Herbal Products Pvt. Ltd. has send demand for procurement of some medicinal plants to RCFC ER to connect with farmers. RCFC ER has already linked them with farmers to provide Aloe vera and Ashwagandha.
- RCFC ER has received enquiry about Citronella oil from Sulekha Works Limited





## H. Success Stories

### Case - I

### Medicinal Plants Promotion by NEPO FPO Group

NEPO FPO Group, Krishnagar, Nadia, West Bengal is working on multiple projects since its inception on 1st April, 2015. Among other social and economical projects, cultivation of Medicinal plants by organizing farmers is one of the crucial project, and initial guidance was received from NMPB Facilitation Centre at Narendrapur Ramkrishna Mission. Following their suggestions NEPO adventures to organize local farmers and motivated them to cultivate various medicinal plants.

In 2016, with the cooperation of local administration, NEPO has started the cultivation of Ekangi (*Kaempferia galanga* L.), and subsequently the business link was established with the potential buyers. Through the Buyer Seller meet in 2016, NEPO could successfully bring 542 farmers under this cultivation project. The benefited farmers set example for others and 3000 more interested farmers have applied to join for cultivation of medicinal plants in the financial year 2017-18.



After doing successful soil testing of those farmers fields, NEPO brought 2250 more farmers under the project, and before doing the marketing of those cultivated products, SMPB came into picture to facilitate. NEPO managed to get a fund of Rs. 2 crores through SMPB in 2018-19 and facilitated to establish a market linkage with the exporters. NEPO FPO has received the farmers subsidy of Rs. 81 Lakhs from NMPB through SMPB, West Bengal. NEPO has exported 360 ton of *Kaempferia galanga*, by making a business contract with a selected company, and in 2018-19 NEPO has successfully made a business of Rs. 6 crores 40 lakhs.

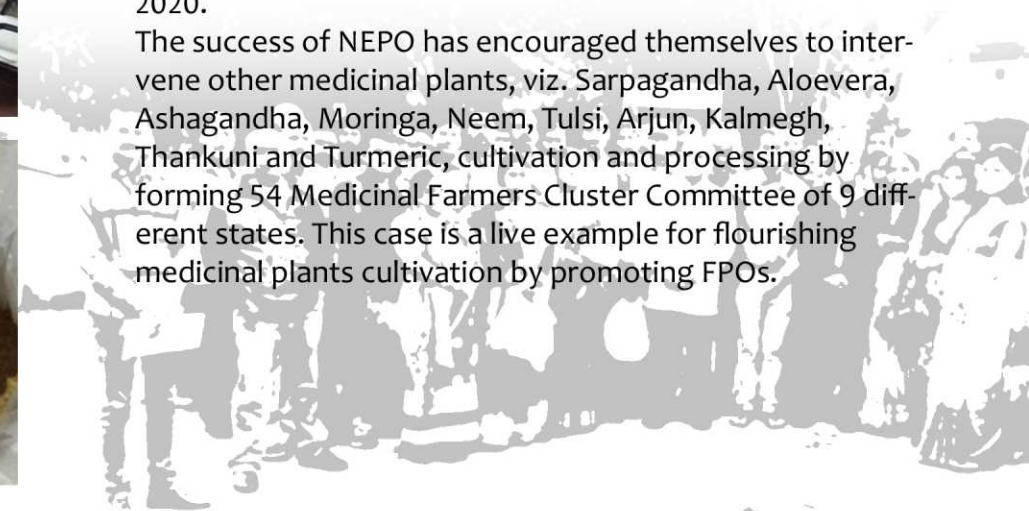


In 2019-20, NEPO intended to bring 24200 farmers under this project through Medicinal Farmers Cluster Committee under the chairmanship of Mr. Abhijit Ghosh.

NEPO is working not only on Ekangi but also other beneficial medicinal plants in order to make a righteous business of the cultivated products. NEPO is also intended to create Home Herbal Gardens in 3000 homes in Nadia district with technical support from RCFC-ER.

NEPO is implementing projects in convergence with MGNREGA for establishment of 15 model medicinal plants nurseries which will create jobs for 550 unemployed persons apart from raising quality planting material. NEPO is establishing a model processing unit under the guidance of RCFC-ER, NMPB and already managed fund from district administration and SMPB which will be in operational by 2020.

The success of NEPO has encouraged themselves to intervene other medicinal plants, viz. Sarpagandha, Aloe vera, Ashagandha, Moringa, Neem, Tulsi, Arjun, Kalmegh, Thankuni and Turmeric, cultivation and processing by forming 54 Medicinal Farmers Cluster Committee of 9 different states. This case is a live example for flourishing medicinal plants cultivation by promoting FPOs.





## Case - II

### Inspiring Journey of Mr. S.K. Das to a Medicinal Plants Entrepreneur

Mr. Santosh Kumar Das has established himself as a medicinal plants entrepreneur, who is involved in raising quality planting material, cultivation, primary processing and marketing by organizing farmers and establishing linkage with international market. As on date, he has the credit of cultivating about 500 ha of commercial Lemongrass (*Cymbopogon flexuosus*) cultivation in Mayurbhanj, Balangir, Keunjhar and other districts of Odisha and about 70 ha of Sarpagandha (*Rauwolfia serpentina*) in Mayurbhanj district of Odisha involving more than 1200 farmers with 100% marketing assurance of the products. He has reach in the domestic as well as international market including United States of America (USA) and Europe with quality products of medicinal plants origin. His total volume of medicinal plants related business has raised around 2 Crores in last financial year (2018-19).



Cultivation and Marketing Detail of Medicinal Plants by Mr. S.K. Das

Sl. No.	Name of the species	Area (in ha) cultivated	Product Supplied to	Year of Cultivation
1.	Ranti Bange ( <i>Solanum viarum</i> )	324	Synthozym Laboratory, Jalgaon	2002
2.	Ashwagandha ( <i>Withania somnifera</i> )	243	Local pharmacies of Odisha	2006
3.	Gurmar ( <i>Gymnema sylvestre</i> )	207	"Best Nutrition" (USA) through Biotech Ayur, Balasore, Local Traders	2006
4.	Sadabahar ( <i>Catharanthus alba</i> )	227	Laboratory PFR (France) through Indian Village Herbs Pvt. Ltd., Chennai	2008
5.	Batch ( <i>Acorus calamus</i> )	3	Local Traders	2009
6.	Sarpagandha ( <i>Rauwolfia serpentina</i> )	67	Biotech Ayur, Local Traders	2014-2018
7.	Lemongrass ( <i>Cymbopogon flexuosus</i> )	498	Exported to "doTERRA", USA via Mumbai	2014 onwards

Mr. Das, the trained forester, has started his early career as a Forester in Odisha Forest Department and worked around 16 years. He perceived the declining medicinal plants treasure from natural forests and envisage to grow outside the forest areas. He just made a trial with commercial nursery of Medicinal Plants for quality planting materials and enter into a good business. Since then, he carried out several field trials, value-addition and marketing of medicinal plants and gradually became an Entrepreneur in the sector having the experience on cultivation and marketing of medicinal plants.

As the Director of 'SABUJA BIPLAV' (an NGO, creating an enabling environment for the Conservation, Socialization, Promotion, Research and Marketing of Medicinal Plants in Odisha), Mr. Das has developed quality planting material of Gurmar (*Gymnema sylvestre*), Lemongrass (*Cymbopogon flexuosus*) and Sarpagandha (*Rauwolfia serpentina*) with the financial assistance by RCFC-ER, NMPB and proved his expertise.

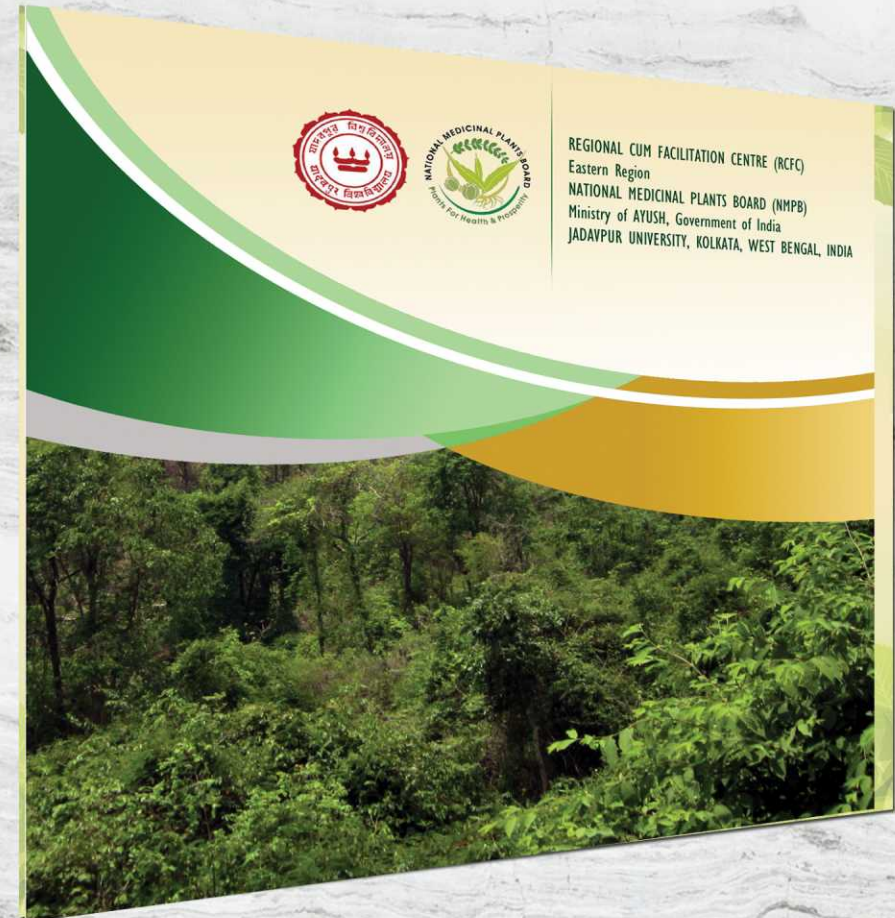
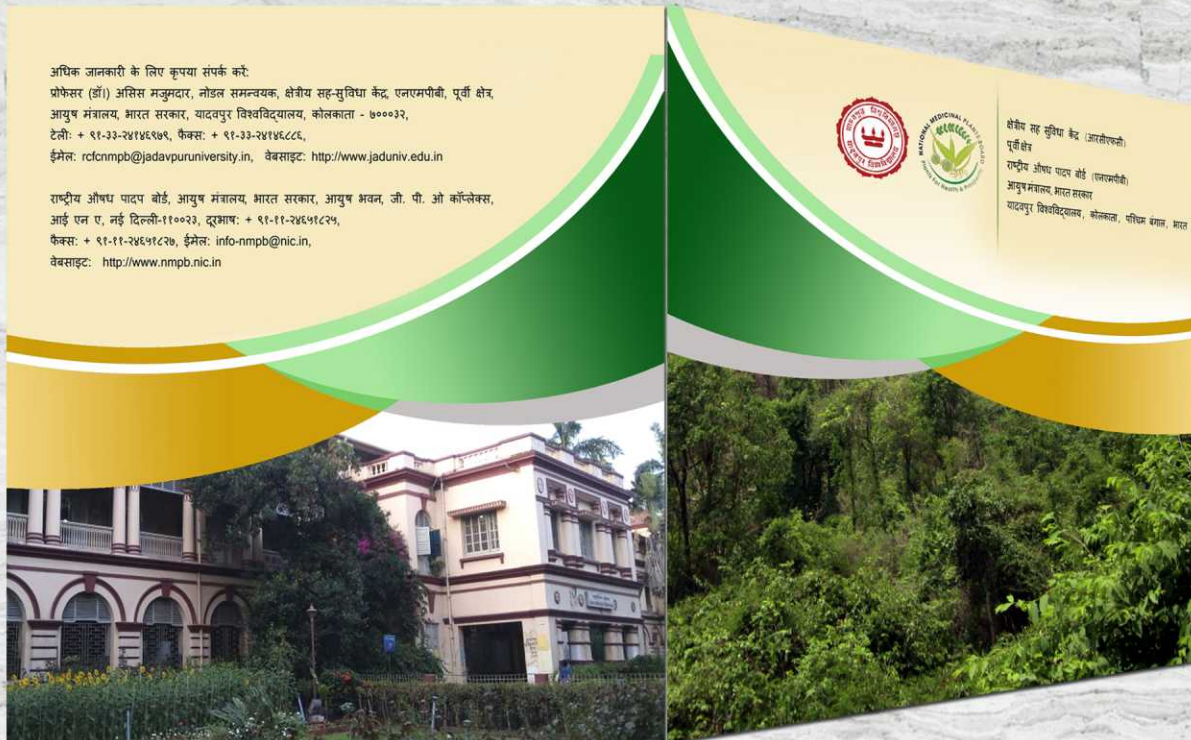
During this period Mr. Das has the honour of working as Consultant in World bank project related to Medicinal Plants for sustainable livelihood (In-situ sustainable harvest and Ex-situ cultivation), and also Consultant for NR International supported by DFID-Western Orissa Rural Livelihood Project for 'Home Herbal Garden'.

At present, he is the Adjunct Professor of Centurion University, Odisha and also actively involved in two companies namely - 1. "Phytobiox Manufactures Pvt. Ltd.", having Import-Export code for export of Botanical products, and helping the farmers for value addition and marketing of Medicinal Plant products, being established the Common Facility Centre (CFC) in Suliapada block, of Mayurbhanj; and 2. "Foothill Rubber Plants Pvt. Ltd.", is Producing the quality Planting Materials to meet the demand of the rubber of Farmers, Corporate and others.

As an medicinal plants entrepreneur, Mr. Das envisage to establish a super critical (CO<sub>2</sub>) extraction unit in Odisha to help 50,000 farmers family for their evolutionary livelihood and dignity of life.

# I. Publication/Awareness Details

Brochure for the RCFC has been prepared in English, Bengali, Hindi & Odiya which is being circulated the concerned stakeholders as per their convenience



# Participation in 'State Level Arogya Fair' at Kolkata 1 - 3 March, 2019

## Participation in Sundarban Kristi Mela 20 - 29 December 2018

As per directive of NMPB, Ministry of AYUSH, Govt. of India one stall in the 23rd Sundarban Kristi Mela at Kultali Basanti, South 24 Pgs, West Bengal was set for publication of medicinal plants in association with State Medicinal Plants Board, West Bengal during 20th-29th December 2018. The stall was acquired by NMPB, New Delhi. Stall set up, brochure distribution, interaction with farmers and lecture was given for the promotion of medicinal plants among the masses.





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## J.Settlement of Pending UCs of Other Project Implementers

- Pending UCs in 3 states i.e, Bihar, Jharkhand & West Bengal were constantly pursued, out of which 2 UCs in West Bengal for the Project No. Z.18017/187/CSS/JFMC/WB-01/2014-15-NMPB dated 25.09.2014 awarded to Research Circle, Directorate of Forests, Govt. of West Bengal and Z.18017/187/CSS/R&D/WB-05/2016-17-NMPB-IV A dt. 29.12.2016 awarded to Uttar Banga Krishi Vishwavidyalaya has been settled and agencies received their 2nd Instalment.

- 1 UC in West Bengal for the Project No. IEC/WB - 01/2014 dt. 25.09.2014 awarded to Badulara Desshari Society were settled and informed to NMPB

- 2 UCs in Odisha for the Project No. JFMC/OR-01/2014 awarded to Divisional Forest Officer-cum-CEO, FDA, Bonai Forest Division and Project No. JFMC/OR-03/2014 awarded to Divisional Forest Officer-cum-CEO, FDA, Baliguda Forest Division were settled and informed to NMPB.

- UCs pending with SMPB, Jharkhand and SMPB, Bihar were settled and informed to NMPB.



## Data Maintenance

- Data for e-charak is collected and maintained (from Kolkata, Siliguri and Berhampur market) twice in a month
- Scheduled TA forms collected for West Bengal and data analysed
- Data of farmers, experts, traders and industries are maintained
- Records of medicinal plants in cultivation and trade in the region is maintained
- QPM production and distribution data is maintained



# Human Resources



**Prof. Asis Mazumdar**  
Nodal Coordinator,  
Regional cum-Facilitation Centre,  
Eastern Region,  
NMPB, Jadavpur University, Kolkata



**Dr. Sanjay Bala**  
Regional Director



**Dr. Soumyajit Biswas**  
Deputy Director



**Mr. Sudipto Ghosh**  
Consultant (Marketing)



**Shri Debarun Kundu**  
Consultant (IT)



**Mr. Subodh Kumar**  
Technical Assistant (Bihar)



**Shri Krushna Chandra Behera**  
Technical Assistant (Odisha)

*In addition, RCFC-ER has four support staff*



*For more information please contact:*

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