

**FITM**Forum on Indian  
Traditional Medicine**FITM POLICY BRIEF**

# Medicinal Plant Cultivation for Poverty Reduction: Prospects and Challenges

## Introduction

Agricultural growth has long been considered as an important instrument for poverty reduction in India. Eighty per cent of Indian poor are in rural areas, their livelihood directly or indirectly dependent on performance of agriculture.<sup>1</sup> But given that historically agriculture has not grown at rates exceeding 5 per cent per annum,<sup>2</sup> poverty alleviation through agricultural growth requires strategic interventions. The sector is already witnessing a gradual structural change with declining share of food grains, traditionally a major contributor to agricultural growth. In comparison, horticulture (fruits, vegetables, flowers, plantation crops, medicinal and aromatic plants (MAPs)) is increasingly recognised as a sunrise sector owing to its potential to raise farm income, provide livelihood security and earn foreign exchange through export. By accounting for 13 per cent of global production of fruits and 21 per cent of vegetables India is the second largest producer of both commodities, after China<sup>3</sup>. Cultivation of MAPs is yet to be undertaken as a mainstream agricultural activity by farmers even as domestic and international demand for herbal products grows and profitability of cultivated MAPs has been proven.

The use of natural products derived from plants has been on the rise, as is

evident from the increased popularity and acceptance of plant-derived health care as well as cosmetics/perfumery products, despite the high cost of these natural products. Driven by this rising consumer preference, both domestic and international demand for MAPs has been growing. Domestic demand for herbs during 2014-15 was more than 520,000 MT, an increase of 62 percent in volume over the year 2005-06.<sup>4</sup> India is also a major exporter of MAPs, exporting USD 330.18 million worth of herbs during 2017-18 with a growth rate of 14.22 per cent over the previous year.<sup>5</sup> Currently, majority of MAP supply is sourced from forests (72 per cent of the 272 species) though commercial cultivation through contract farming is being undertaken by larger industrial houses to augment supply. Farmers are taking up cultivation of high demand MAPs mainly for MAP dependent industries<sup>6</sup> on a limited scale. Similar to the growth in high value horticulture crops such as fruits and vegetables,<sup>7</sup> growth in MAPs cultivation could serve as an important vehicle for income generation for small farmers if harnessed with the right policy support.

## Centrality of Agricultural Sector for Poverty Reduction: Role of Crop Diversification

Agriculture assumes centrality in poverty reduction strategies for several reasons. Despite the growth of other sectors, agriculture is still the biggest

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source of employment. According to 2011-12 Employment-Unemployment Survey by NSSO, agriculture employed 49 per cent of the total workforce.<sup>8</sup> Besides, rural farm and non-farm incomes being interdependent, even a strong non-farm rural economy requires a strong agricultural economy. At present, per capita income of those employed in agriculture is one-third of the national average.<sup>9</sup> Further, there is significant income disparity within the sector where 45 per cent of the cropped area is cultivated by 85 per cent of small and marginal farmers.<sup>10</sup> Past strategies on development of the sector focussed on raising agricultural output and improving food security. These strategies did not explicitly recognise the need to raise farmers' income resulting in many cases where farmers' income did not grow at par with an increase in output.<sup>11</sup> The recent policy target of doubling farmers' income by 2022 has been made in recognition of this deficit.<sup>12</sup> Some of the key recommendations made towards income growth within the agricultural sector include increase in agricultural productivity, increase in crop intensity and diversification towards high value crops (HVCs).<sup>13</sup>

Crop diversification to HVCs (fruits, vegetables, fibre, MAPs, condiments and spices and sugarcane) has been an important strategy for raising farmers' income. India has been moving towards crop diversification as contribution of food grains to total agricultural output declines. Between 2001-02 and 2016-17, production of food grains grew at 1.7 per cent on average.<sup>14</sup> During the same period horticulture production grew at an average rate of 4.8 per cent, from 145 million tonnes to 295 million tonnes.<sup>15</sup> Preference for HVCs is based on higher economic returns as compared to staple crops. Staple crops (cereals, pulses, oilseeds) occupy 77 per cent of the total or gross cropped area (GCA) but contribute only 41 per cent of the total output of the crop sector.<sup>16</sup> Almost the same value of output was contributed by HVCs which occupied only 19 per cent of the GCA during 2013-14.<sup>17</sup> The value of average productivity of HVCs was estimated at Rs 1,41,777 per hectare as compared to Rs 41,161 per hectare for staple crops.<sup>18</sup> With difference in productivity, an estimated shift of one hectare area from staple crops to commercial HVCs has the potential to increase gross returns up to Rs 1,01,608 per hectare.<sup>19</sup> If this trend in diversification continues it has the potential to translate into 5 per cent increase in farmers' income by 2022-23.<sup>20</sup>

MAPs have been a part of horticulture production though the share in cropped area and production till date is the lowest (Table 1). Cropped area of MAP as a percentage of horticulture crops is only 2.8 per cent.

**Table 1: Area, Production of Various Horticulture Crops in India (2018-2019-1st Advance Estimates)**

Crops	Area (In ' 000 Hectare)	Production (In ' 000 MT)
Total Fruits	6530	96754
Total Vegetables	10436	187474
Aromatics and Medicinal	717	889
Total Flowers	339	2858
Total Plantation	3762	17991
Total Spices	4086	8590
Total	25870	314671

*Source:* Department of Agriculture Cooperation and Farmers' Welfare, Ministry of Agriculture and Farmers', Welfare, Government of India.

### MAP cultivation: Prospects for Small and Marginal Farmers

The economic potential of MAPs is reflected in the global market of products derived from plants which was estimated at USD 83 billion in 2015.<sup>21</sup> The total domestic demand for raw herbal drugs estimated at 5,12,000 MT for 2014-15, is expected to grow to 6,50,000 MT by 2020. Assessing supply is difficult owing to non-availability of reliable country wide statistics. However, as per All India Trade Survey of Prioritised MAP the demand for high value MAP has increased by 50 per cent while availability has declined by 26 per cent.<sup>22</sup> The prospects for small farmers are that even as majority of the species is collected from forests, most of the high demand species can be cultivated. At present 242 high demand species are traded in annual quantities of more than 100 MT of which 72 per cent are sourced from forests and only 54 species, i.e. 22 per cent, sourced entirely from cultivation.<sup>23</sup> Majority of the cultivation is on small scale though they can be farmed on large scale.<sup>24</sup>

As an agricultural crop MAP cultivation offers several benefits to both farmers and industry. The industry prefers raw material from known sources as this ensures quality, uniformity, reliability and

continuity. Farm collection ensures traceability of these sources. For farmers, compared to bulky and perishable food grains and horticulture crops, MAPs have higher value per unit volume which makes them particularly attractive for remote, mountainous areas with transport limitations.<sup>25</sup>

Other advantages include ease of their incorporation in the existing cropping systems due to availability of a large number of species and choice of plant types. Cultivation of carefully selected species as a mixed, inter or companion crop in agro and farm forestry conditions following a soil-improving crop rotation is a highly feasible livelihood enhancing activity.<sup>26</sup> Many species can be cultivated without high investment in inputs, on marginal or degraded soils that are relatively low on fertility, and even with low water availability.<sup>27</sup> MAP cultivation is also less risky in terms of the incidence of wild animals, pest and diseases attack.<sup>28</sup> The sector offers a great opportunity to those cultivating in difficult terrains to adopt cultivation of medicinal plants as a low risk opportunity. Cultivation and processing being a labour intensive process the MAPs also have great potential for employment generation in the agriculture sector.

Field studies have noted encouraging returns for small farmers.<sup>29</sup> For example, in Himachal Pradesh, benefit-cost (B:C) ratio was found to be 1.30 for *Safed Musli* (*Chlorophytum borivilianum*), 1.27 for *Stevia* (*Stevia rebaudiana*) and 1.22 for *Aloe Vera*.<sup>30</sup> Another study demonstrates the cost benefit ratio of 2.22 for production of *coleus* crop (*Coleus forskohlii* Briqin) in Karnataka.<sup>31</sup> Indian Council of Agricultural Research (ICAR) studies show that on an average, a farmer can get approximately Rs. 2,49,000/ha/year net returns from the cultivation of *brahmi* (*Bacopa monnieri*) as a sole crop in low lying field. The B:C ratio was 2.99. Similarly *Tulasi's* (*Ocimum tenuiflorum*) intercropping with lime has yielded net returns as high as (Rs. 59,201/ha/year). Rao and Saxena<sup>32</sup> (1994) reported average annual (per hectare) income of Rs.1,20,000 through mixed cropping of high altitude medicinal herbs. Data for some low altitude crops from the Amarkantak region of Madhya Pradesh show higher returns for four profitable species.<sup>33</sup> Even compared to other major field crops yielding high returns like sugarcane, studies show better profitability of high demand MAPs<sup>34</sup> (Table 2).

At present, twelve major high demand species, viz. Isabgol, Henna, Senna, Mentha,

Tulasi, Ashwagandha, Aloe, Pippali and Pippal Mool, Bach, Artemisia, Vetiver and Kuth are being cultivated across the country. Many larger pharmacies like Dabur, Zandu, Himalaya Drugs, AVS, Kottakkal, Shree Dhootpapeshwar, etc., undertake contract farming of medicinal plants to meet their demand.<sup>35</sup> The modern pharmaceutical industries like Cipla, Natural Remedies, Samilabs, Core Health Care, Cadila Health Care, Bio-Ved Pharma, etc., who specialise in production of a few speciality drugs/chemicals from plant sources are also involved in contractual cultivation to supplement their requirements.<sup>36</sup> Most small farmers supply MAPs to the industrial units under the contract farming model which often includes buy-back arrangements.<sup>37</sup> However, more often MAP cultivation is intercropped with other crops<sup>38</sup> and is seen as an addition to the current farm income. Cultivation as a pure crop is not widespread.

**Table 2 : Comparative Returns from MAPS (Uttarakhand)**

Sl No.	Crops	Cost of production	Gross returns	Net returns
1	Sugarcane	48,343	84,323	35,980
2	Fine paddy-wheat	44,216	63,501	19,285
3	Coarse paddy-wheat	42,947	58,853	15,906
4	Fine paddy-mustard-vegetable pea	56,183	81,184	25,002
5	Lentil-coarse paddy	36,154	45,158	9,004
6	Lemongrass oil	57,230	1,06,205	48,974
7	Citronella oil	56,408	1,02,107	45,699
8	Patchouli oil	36,101		25,821

Source: Rashi Mittal and S.P. Singh .2007. Shifting from Agriculture to Agribusiness: The Case of Aromatic Plants, Agricultural Economics Research Review Vol. 20 (Conference Issue) 2007 p-548 <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.565.9185&rep=rep1&type=pdf>

### Central Schemes for MAP Cultivation Promotion among Small Farmers

At the nascent stages of mainstream MAP cultivation by small farmers, success would be dependent on a number of factors like location selection, good genetically stable planting material, good agro technological practices, nutrient input,

harvesting management and implementation of suitable post harvesting techniques to preserve the end product till marketing arrangements are made. This requires input and service delivery system including marketing, and post harvest technologies. For small and marginal farmers considerable financial and technical support would be required to motivate MAP adoption as pure crops. A number of Central Schemes have provided for MAP cultivation support. Given that agriculture is a state subject, these schemes are implemented by designated state agencies. There is considerable diversity in nature, timing and speed of implementation of the Central schemes in states.

### **The National Horticulture Mission**

The National Horticulture Mission (NHM) was launched in the year 2005-06 to develop horticulture sector through forward and backward linkage by means of cluster approach. Some of the major programmes implemented have included supply of quality planting material, establishment of nurseries and tissue culture units production and productivity improvement programmes through creation of infrastructure for post harvest management and marketing.<sup>39</sup> Between 2001-02 to 2016-17, the total area under the horticultural crops increased from about 16.5 million hectares to 25 million hectares, at an annual growth rate of about 3.0 per cent while the total production of horticulture commodities increased from 146 million tonnes to 295 million tonnes at an annual growth rate of 5.8 per cent.<sup>40</sup> However medicinal plants component has been a small proportion of the NHM which includes fruits, vegetables, spices and plantation crops among others.

### **National AYUSH Mission's Medicinal Plant Cultivation Programme**

The National AYUSH Mission (NAM) is the key Central Scheme responsible for MAP cultivation promotion. Support to farmers under the Scheme includes supply of quality planting material, plant processing and post harvest management including marketing, certification and insurance. The Mission provides for mobilizing growers to form Self Help Groups (SHGs)/ Cooperatives/ Federations, producer companies and extends financial assistance for promoting these grass root level organizations, which may include training and other incidental expenses like engaging animators.

Support for setting up processing clusters through convergence of cultivation, warehousing, value addition and marketing and development of infrastructure for entrepreneurs to set up units in such clusters is also being provided.<sup>41</sup> Designated AYUSH Societies established at state level are responsible for funds disbursement.

Resource allocations for medicinal plants in North East (NE) and hill states of Uttarakhand and Himachal Pradesh has been 100 per cent while it is 90:10 ratio between centre and other states. Subsidies under the NAM have been as high as 75 per cent for 13 prioritised plants, 50 per cent for 27 plants and 30 per cent for 55 plants.<sup>42</sup>

Satisfactory performance under NAM cultivation promotion has been recorded in states of Andhra Pradesh (AP), Himachal Pradesh (HP), Karnataka, Kerala, Nagaland, Rajasthan, Telangana, Uttarakhand and West Bengal.<sup>43</sup> The number of farmers who have been motivated to adopt medicinal plant cultivation has increased along with corresponding increase in cropped area.<sup>44</sup> Commercial success of *Ashwagandha* and *Pippalaoumodi* cultivation in Andhra Pradesh, *Shankhapushpi* cultivation in Rajasthan, *Senna* cultivation in Tamil Nadu, *Tej Patta* cultivation in Uttarakhand and *Aloe vera* in Telangana have been documented.<sup>45</sup>

Some of the factors contributing to increase in MAP cultivation by farmers under NAM include innovations such as complete Global Positioning System (GPS) mapping, market intelligence gathering and effective buyer-seller meets in Telangana, establishment of herbal collection centre in Rajasthan and community outreach programmes in Kerala. Successful coordination between State AYUSH Society and respective implementing agencies such as the horticulture departments, State Medicinal Plants Boards (SMPBs), and irrigation departments has been another reason. High performing states such as AP, HP, Kerala, Rajasthan, Telangana, Uttarakhand have established successful small nurseries which are able to supply certified, quality planting material to the farmers to meet the current demand and also ensure that the survival rate of the planting material in each case is more than 90 per cent. The small nurseries have also contributed significantly to the diversification of medicinal plant cultivated in the states where these are under implementation

Public Private Partnership (PPP) models in collaboration with major companies under contract farming are also emerging as the reason for success. Aided by SMPBs, many Fast Moving Consumer Goods (FMCG) companies have entered into buy back arrangements with farmers. Other PPP models like the Oushadhavanam model, a project implemented by a labour cooperative society based at Mattathur in Thrissur,<sup>46</sup> Kerala, is also aiding in cultivation promotion. The society has a tie-up with farmers registered under the Kudumbasree Mission to cultivate plants, under buy back arrangements. Cultivated MAPs are sold to manufacturers such as Kottakkal Aryavaidya Sala, Sitaram Ayurveda Pharmacy, Vaidyaratnam Oushadhasala, and state-owned Oushadhi. The SMPB provides funds for procuring seedlings.

## Challenges for Small and Marginal Farmers

For MAP cultivation promotion as a poverty alleviation tool income generation is the key. However, in many cases, despite profitability, farmers have been reluctant to engage in MAP cultivation in view of several impediments.<sup>47</sup> Some important bottlenecks are as follows:

**The nature of MAP and timely disbursement of funds and subsidies:** Given that crop cultivation management is a strictly time bound activity and medicinal plant cultivation is to be undertaken as per the seasonal requirements of the plant species, the timely release of funds is critical to implementation success. As many as 12 states under the NAM programme have delayed cultivation owing to late receipt of funds towards end of the financial year 2016-17 or even into 2017-18.<sup>48</sup> Through the Direct Benefit Transfer (DBT) programme, beneficiaries are being given benefits directly, eliminating intermediaries and delays in transfer of benefits. DBT is given for micro-irrigation and schemes under Mission on Integrated Development of Horticulture (MIDH). Currently, NAM subsidies and finances flow from the Central Mission through the State AYUSH Societies in coordination with the state Horticulture departments. The process has created issues of bottlenecks and delay in funds reaching farmers. The role of initiative and coordination between agencies at the state level would be crucial in disbursement of funds and subsidies.<sup>49</sup>

**Appropriate information communication mechanisms:** For small and marginal farmers without the adequate financial and technological capacities, knowledge of existing support schemes available at various stages of MAP cultivation is crucial. For example, farmers are entitled to 50 percent of the testing charges subject to a maximum of Rs. 5000 if the herbs/medicinal plants are tested in AYUSH/National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited Laboratories.<sup>50</sup> Yet none of the states has availed of this sub component under NAM implying the failure in knowledge dissemination about available support mechanisms.

**Insurance:** Several MAPs are not covered under public insurance schemes like Pradhan Mantri Fazal Bima Yojana (PMFBY). Even where NAM MAP component seeks to provide assistance towards payment of 50 percent of the premium for particular crop it has not been availed by any of the states so far.<sup>51</sup>

**Market linkage:** Marketability of the produce is a huge incentive for motivating MAP cultivation in small farmers given the perishable nature of many plants. Strengthening market promotion, intelligence and infrastructure are crucial components. 'Buy' revolving funds add to the support.<sup>52</sup> Most states barring some like Telangana and Andhra Pradesh are yet to implement effective programmes for support of these components.

## Policy Interventions

The challenges and issues of MAP cultivation sector highlighted above requires specific policy measures to make it an effective tool for poverty alleviation. Some suggestions are presented below.

**Contract farming and land lease provisions:** The National Policy for Farmers (2007) recognises contract farming as a relevant model for agribusiness. For small farmers, it offers, perhaps, the only way to make farming competitive by enabling them with access to technology, credit, marketing channels and information while lowering transaction costs. At the same time, it offers a feasible and viable model for large scale private sector participation in agriculture. MAP cultivation too is being increasingly undertaken through contract farming. However, reported breach of legal contracts acting against farmers' interests has pointed to the need for revision of

regulatory framework.<sup>53</sup> The Draft Model Contract Farming Act 2018 seeks to address this issue.

Restrictive land lease laws have forced tenancy to become inefficient and insecure, preventing both small and large farmers from reaping benefits associated with contract farming of MAPs. Some small farmers may prefer to lease their land in favour of alternative occupations if they had assurance of returning to farming in future if required. Some large farms may lease in land and even employ the small owners on their own farms to grow MAP under supervision. At present, many large and absentee owners leave land under-cultivated. This land could be cultivated more productively if it could be leased out without fear of loss of ownership. The Model Agricultural Land Leasing Act, 2016 has proposed to address some of these issues.

**Documentation for data generation:** Data generation is crucial for policy planning with regard to small and marginal farmers. In this regard, lack of documentation on MAP cultivation has been often cited as a serious bottleneck. *Patwari* registers maintained at the subdivision or *tehsil* level record crop grown at every harvest, statistical information derived from harvest inspections and information on mutations and record of rights. As yet *Patwari* registers do not record cultivation of medicinal plants by farmers.<sup>54</sup> Initiating documentation beginning with *patwari* registers may provide the much needed support for data generation on MAP cultivation.

**MAP farmers' cooperatives:** Small and marginal farmers may be organised into SHGs and cooperative societies of medicinal plant growers or as producer companies. From an administrative point of view, cultivation in clusters through SHGs, growers cooperatives, and producer companies ensures easier targeting of subsidies for small and marginal farmers. Cultivation needs to be done on a business platform by a chain of small and micro-enterprise-based groups and individuals. In order to achieve economy of scale and desired impact, it may need to be concentrated in selected pockets in an intensive manner as cluster of activities and micro-enterprises.

**De-clustered processing of MAP activities :** MAP cultivation is critically dependent on timely release of funds. The implementation performance of the MAP schemes is affected by issues related

to timely fund flow under the current institutional arrangements of the National AYUSH Mission. Niti Aayog has suggested that this current bottle neck can be considerably ameliorated by de-clustered processing of the proposals for medicinal plants cultivation received from the States from the other schemes of NAM, viz., AYUSH Health Services, AYUSH education and AYUSH Medicines.<sup>55</sup>

## Way Forward

Given the growing domestic and global market for herbal products, which is estimated to reach USD 5 trillion by 2050,<sup>56</sup> mainstreaming cultivation of high demand MAP species could serve as an important vehicle for income generation for small and marginal farmers. Central and State initiatives have demonstrated that increasing MAP cultivation offers growth in income for small and marginal farmers. This could be utilised in diverting from the present pattern of farming with traditional staple crops, often associated with preventing farmers from escaping the cycle of poverty associated with agriculture in India.

To make MAP cultivation lucrative, farmers/growers have felt need for technical and financial hand holding support in the initial stages. Addressing the challenges highlighted above is required for incentivising small farmers. Many of the challenges are related to procedural complexities. Direct benefit transfers, designated *mandis* at district level and information communication about available facilities like testing laboratories are some important measures to instil confidence in small and marginal farmers. A focussed Mission on MAP cultivation could provide the required step.

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- <sup>50</sup> Voluntary Certification Scheme For Medicinal Plant Produce Certification Process, NMPB, Available at [https://www.nmpb.nic.in/sites/default/files/Certification%20Process\\_version%20II\\_Sep\\_2017.pdf](https://www.nmpb.nic.in/sites/default/files/Certification%20Process_version%20II_Sep_2017.pdf)
- <sup>51</sup> Ministry of AYUSH. 2018. *Mid-Term Evaluation of National AYUSH Mission (NAM): -Medicinal Plant Component (Phase II report)*.
- <sup>52</sup> Ministry of AYUSH. 2018. *Mid-Term Evaluation of National AYUSH Mission (NAM): -Medicinal Plant Component (Phase II report)*.
- <sup>53</sup> Interview with Padmapriya Balakrishna Deputy CEO, NMPB
- <sup>54</sup> Interview with Padmapriya Balakrishna Deputy CEO, NMPB.
- <sup>55</sup> NITI Aayog's recommendation based on *Mid-Term Evaluation of National AYUSH Mission (NAM): Medicinal Plant Component (Phase II report) 2018*.
- <sup>56</sup> Sen Saikat, and Chakraborty Raja. 2017. *Revival, modernization and integration of Indian traditional herbal medicine in clinical practice: Importance, challenges and future*, Journal of Traditional and Complimentary Medicine, Published online 2016 Jun 28. , Available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5388083/#bib17> (Accessed on 17th May 2019)

**About FITM:** The FITM has been established in the RIS with the participation of the Ministry of AYUSH as a common platform for all actors and stakeholders to contribute to pragmatic policy-making in the area of Traditional Medicine (TM) and Traditional Knowledge and to develop pro-active policies and strategies. The broad objectives of the FITM are to: undertake/ commission studies on various issues pertaining to Indian TMs, IPRs and regulatory frameworks for traditional medicinal knowledge; examine trade policy with reference to TMs; prepare cogent and coherent policy and strategy responses on emerging national and global developments; provide critical inputs such as policy briefs, briefings and reports to the Government of India in a continued and sustained way; and to facilitate interactions with experts and stakeholders and policy-makers from India and abroad. It would also provide Fellowships and Scholarships for studies in the area of TMs, arrange invited talks by national and international experts, and organize periodic consultations.



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