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Financial Planning for Small-Scale Herbal Industries based on National Mission on Medicinal Plant scheme: A Case Study

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Abstract: *The study proposes financial plans incorporated with National Mission on Medicinal Plants (NMMP) Scheme for small-scale herbal industries. The study identifies the role of various parameters like raw material source, processing type and entrepreneur type that can affect the feasibility of the financial plan both for the economically weaker sections as well as private entrepreneur in rural areas. A case study on setting up semi-processing unit for Phyllanthus amarus in Khirvire Village, Ahmednagar District, and Maharashtra is used to demonstrate the importance and potential of financial plans support for any rural entrepreneur. This study could help policymakers in developing better policies for successful scheme implementation.*

Keywords*:* Small-Scale Industries, Medicinal plant, NMMP.

INTRODUCTION

Globally, medicinal plants (MPs) are demanded in the healthcare for allopathic drugs [1], medical diagnostic [2] and traditional medical systems [3]. The world MPs demand is expected to increase from Rs. 0.94 trillion in 2009 to Rs. 334 trillion in 2050 [4]. Further, India's nutraceuticals current market stands at Rs. 0.19 trillion with expected compounded annual growth rate of 17% for next 5 years [5]. This global and domestic demand for MPs has put pressure on the current supply sources (majorly wild and forests) [6]. World Health Organization in early 2000s discussed upon sustaining quality MPs supply [7], [8]. India's focus on MPs supply sources sustainability started with its ninth five-year plan (1997-2002) [9] that resulted in the implementation of National Mission on Medicinal Plants (NMMP) scheme in 2008. This mission provides financial as well as technical support to the complete Indian herbal industry supply chain from cultivation to finished product marketing to ensure quality MP supply sustainability and increase in global market share from mere 1% [6]. Such scheme can open new livelihood opportunities in rural areas that could allow rural entrepreneurs to shift from cultivators and collectors to small-scale industrialists.

Accordingly, these rural entrepreneurs require a financial plan for their project to approach the government for support. A financial plan provides a summary about the sources and allocation of various financial resources to the various future expenses that helps in making a decision of selecting the most appropriate business plan. However, both the NMMP operational guidelines and limited literature on NMMP fall short of providing a system or framework to help rural entrepreneurs to develop their own financial plan [6]. Studies by Jain and Rao (2013 and 2015) showed the policy design issues like project selection decision, technology silence, accountability and content clarity that can affect both mission implementation and rural entrepreneurs [10], [11].

Further, studies in Uttarakhand State, India by Pangriya (2015) and Kuniyal *et al* (2015) had raised the implementation issues like MP

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quality control and site selection in the various MPs related scheme including NMMP [12], [13]. Further, the report by steering committee on AYUSH (2012) has identified the NMMP inadequate target achievements related to market share, rural employment and total area under cultivation [14]. Accordingly, this study focuses on developing the financial plan for rural entrepreneurs to bridge the current knowledge gap. A case study approach is adopted using 2010 data for prices and demand to test financial plan viability of various possible scenarios for setting up of *Phyllanthus amarus* MP semi-processing unit at Khirvire village, Akole Taluka, Ahmednagar District, and Maharashtra.

This study makes the contribution in several directions. Firstly, it provides a framework to enable rural entrepreneurs to develop their own financial plans. Secondly, such an exercise would allow the policymakers to forecast the different type of entrepreneurs' success in a setting. Accordingly, polices could be modified or designed to strengthen the involvement of weaker groups in the herbal sector. Thirdly, identification of the different parameters followed by their response for the financial plan potential success in a given area means a methodological contribution. Finally, integration of the NMMP norms into the financial analysis provides a theoretical contribution in the field of decision-making for NMMP.

Method

Study Parameters

The visit and interaction with the locals of Khirvire village in 2010 provided insights about village's favorable agro-climatic conditions for various MPs like Phyllanthus amarus grown in the Western Ghats (WG). This MP is given subsidy under NMMP and used in the pharmaceutical industry for extraction of majorly two compounds namely Phyllanthin and Hypophyllanthin. They also contain Phenolic acids that are focused in research for their medicinal properties like anti-tumor, and anti-inflammatory [15].
The study prepares different financial plans for different scenarios using three parameters raw material supply source (RMSS), level of processing (LP) and entrepreneur type (ET). RMSS for an industry can be either from the cultivator or the collector. The cultivator would cultivate MPs on his agriculture field during the Kharif season, while the collector would collect from the wild. Currently, the village does not have adequate Phyllanthus amarus in wild, but collector parameter chosen to understand financial plans for other similar villages with sufficient availability of plant in wild. In addition, based on interaction with agriculture experts, it was found that cultivated variety of Phyllanthus amarus give 0.5% Phyllanthin content [16] compared to 0.3% in wild variety.
LP for the industry can be either only powdering of dried Phyllanthus amarus or enhancing the concentration of phyllanthin. The process considered for concentrating Phyllanthin is one that is developed by Jain and Rao (2014) to reduce phenolic acid concentration from biological material. In this two products will be produced namely concentrated phyllanthin powder and phenolic acids liquid [17]. ET for the industry can be either private[1] or Self Help Group[2] (SHG) as this will determine the scheme subsidy and labor charges. In case of the SHG, subsidy is 100% for storage room and 25% for processing unit machines. Further, no labor cost need to be considered as SHG members will provide labor and share profits, a common practice in the area. In case of the private entrepreneur, subsidy is 50% for storage room and 25% for processing unit machines and local labor will be procured.

Defining Scenarios

The scenarios are defined in two stages. In the first stage, four scenarios (Scenario 1-4) are created (Table I) for optimization of the RMCC and LP parameters are performed using SHG as the ET. The best value of RMCC and LP are selected for scenario 5 in which ET parameter is private entrepreneur. The financial plan is tested to have short payback period, higher Internal Rate of Return (IRR), and Net Present Value (NPV).

TABLE I
Different Scenarios considered under study for Financial Plan

Scenario	Raw Material Supply	Entrepreneur	Processing Type
1	Collector	SHG	Dried Phyllanthus amarus powder (DP)
2	Collector	SHG	Phyllanthin concentration enhancing (PCE)
3	Cultivator	SHG	DP
4	Cultivator	SHG	PCE
5	Cultivator/Collector	Private	DP/ PCE

Assumptions

This study used the 2010 for prices and data as data collection and interactions with industry and field experts were made during 2010-2011. Those interactions are used as basis for all assumptions. Industry need not have manufacturing license as no consumer product is sold. Further, no hiring for industry management, entrepreneur will itself manage small-scale industry. The entrepreneur or SHG

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will manage investment money and not considered in this study. The subsidy provided will be released by the government within a year of construction and will be directly deposited into the company account [11].
All the prices given for land, construction, machinery and other items are estimated value made for that area. The 50 kg capacity gunny bags will be used for product packaging that will be returned by product buyer during next transaction. The number of bag purchased will be sufficient to hold 30 days stock and will cost around Rs 20 per bag with yearly bag wastage of 25 percent.

All the expenditures will be on credit basis that will be returned in 15-20 days. The product will be sold within 15 days with selling price to be 20% of the raw material cost. The minimum phyllanthin content in raw material is assumed to be 0.3% with minimum cost price of Rs 20 per kg and price increase rate at Rs 100 per 1.8 percent of total phyllanthin content. The selling price of the concentrated phyllanthin powder would be taken as the raw material cost for the phenolic acid liquid. The process is in a batch mode of 1 batch per hour. The amount of solid removed from the dried powder for phyllanthin concentration is assumed to be 8% [17]. The depreciation for construction and machinery is taken as 10% and 25% respectively [18].

All the cash flows and profits calculated would be before tax. Gross profit will be total revenue minus total expenditure for a given year. Net profit is gross profit minus the depreciation cost for a given year. Cash Profit is net profit plus depreciation cost for a given year. Total cash inflow is gross profit plus the subsidy for a given year. Taxable income is net profit minus investment for a given year. Percentage profit on expenditure is 100*(total cash inflow)/expenditure for a given year. Discount rate or loss in the value of money was assumed to be 10%. NPV and IRR are calculated for the first 6 years. Payback period is the simple payback period.

Industry Operations

The industry production capacity is planned for 80 tons/day with the daily processing capacity of around 500 kg and 160 days (October to March) of functioning. The seasonal functionality will prevent labor competition during agriculture season (May to September). On the basis of interaction with the industry experts and industry visits, the size of the unit is proposed to be around 8400 ft^2, which include the inventory room/storage room of 8000 ft^2. The inventory capacity is designed to hold 1 week of the raw material supply. Further, the space required for phenolic acid liquid extraction will be constructed as the first floor of the processing unit building with total area of 400 ft^2.
In terms of supply sources for various basic requirements, water will be procured from locals at Rs 700/ 5000litres and power will be procured from the power grid at Rs 3 per unit. Since the industry is located within the village, the locals at the industry doorstep will provide the raw material. In the case of labor, the local labor rates of Rs 60/day will apply.
The major machinery used by the industry are shown in Table III includes hard grinding unit, grinding unit and sieving unit. In the case of LP involving the concentration of phyllanthin, additional machinery namely vacuum dryer will be used to dry phenolic acid liquid. The scenarios with the powdering unit alone will have installed power load of 10 kW and seven laborers while scenarios with the concentration of phyllanthin will have installed power load of 14.5 kW and 12 laborers. The raw plant material collected will be stored in the storage room from where it will be constantly provided to the processing section. The industry will be functional for 8 hours/day for six days a week. The buyer will purchase the processed product from the industry doorstep.

Result

Financial Outlays

The break-up of project cost without subsidy in terms of investment and expenditure for all scenarios is given in Table IV. The project cost for different scenarios is different with lowest investment requirement for scenario 1 and is less than half of the highest investment scenario i.e. scenario 4, indicating the impact of RMSS and LP on investment requirement. The collector as raw material source and lower level of processing reduces the investment cost. Further, the project cost increase from SHG to private entrepreneur was less than two percent. The government subsidy for different scenarios is as shown in Table IV. The higher subsidy is provided to scenarios with the higher degree of processing.

Financial Plans

Financial plans summary for different scenarios is shown in Table IV. Scenario 3 has the lowest payback period of 1.3 years, highest IRR of 45.5 percent and NPV of Rs 845,000. Further, this scenario's RMSS and LP parameters are selected for scenario 5 and the financial plan performance of scenario 5 reduced significantly as compared to scenario 1 with an increase in payback period to 2.2 years, reduction in IRR and NPV to 32.7 percent and Rs 545,000 respectively. This could be attributed to the reduction in government subsidy. However, this scenario as compared to remaining three scenarios is much better indicates that scenario 3. The poor performance of scenario 2 than scenario 4 could be attributed to the lower product price owing to lower product quality from wild source of raw material as compared to cultivated source of raw material.

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TABLE III
Machinery Units Type, quantity, cost and power load

Machinery	Quantity	Cost (Rs @ 2010 prices)	Power Load (kW)
Hard grinding unit	1	50,000	3
Grinding unit	1	2,50,000	5
Seiving Unit	1	50,000	2
Vaccum dryer	1	20,00,000	3

Further, low project cost options namely scenario 1 and scenario 2 for SHGs have acceptable payback period and could be considered as local optima. Further, scenario with advanced processing does not seem to have viable financial options while in real world, success of big private players like Natural Remedies Private Limited (NRPL) with sophisticated processing indicate that the next step up the industrialization ladder may require very large investment and scale.

TABLE IV
Financial Projections for Different Scenarios

Particulars	Units*	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Summary of Investment						
Land	Rs (,000)	81	81	81	81	81
Building and civil works	Rs (,000)	528	553	528	553	528
Plant & Machineries	Rs (,000)	375	2,450	375	2,450	375
Total Investment	Rs (,000)	984	3,084	984	3,084	984
Subsidy Summary						
Storage Subsidy	Rs (,000)	480	480	480	480	240
Processing Unit	Rs (,000)	94	613	94	613	94
Total Subsidy	Rs (,000)	574	1,093	574	1,093	574
Total Revenue	Rs (,000)	1,900	2,080	2,850	3,000	
Summary of Expenditure						
Human Resources	Rs (,000)	67	0.0	67	0.0	67
Power Consumption	Rs (,000)	38.0	56.0	38.0	56.0	56
Water Costs	Rs (,000)	0.0	11.0	0.0	11.0	0.0
Maintenance	Rs (,000)	49.0	154	49.0	154	154
Input Costs	Rs (,000)	1,600	1,600	2,400	2,400	1,600
Market costs/Gunny Bags cost	Rs (,000)	6.0	6.0	6.0	6.0	6.0
Total Expenditure	Rs (,000)	1,694	1,823	2,561	2,626	2,561
Grand Total	Rs (,000)	2,678	4,907	3,545	5,710	3,545
Payback Period	**yr**	**2.9**	**10.8**	**1.3**	**7.6**	**2.2**
IRR (In first 6 years)	**%**	**18.3**	**-12.3**	**45.5**	**-5.2**	**32.7**
Discount rate	%	10.0	10.0	10.0	10.0	10.0
NPV (In first 6 years)	Rs (,000)	**150**	**-116**	**760**	**-847**	**545**
NPV/Total Investment Ratio		**0.15**	**-0.37**	**0.77**	**-0.27**	**0.55**

* All money values are rounded to nearest thousand.

Socio-polity analysis

The study shows that the NMMP support for SHG (commonly formed by small and marginal farmers) could help in improving the socio-economic status as well as help in generating more livelihood opportunities with good financial plans. In addition, the seasonal industry model can reduce the seasonal unemployment problem of the village. Further, this support can also help SHG to develop more competitive financial plans as compared to private entrepreneur owing to a higher subsidy by the government.

Conclusion

NMMP provides the opportunities to rural entrepreneurs in the herbal industry. This study focuses on developing the financial plan for rural entrepreneurs to allow them to benefit from NMMP opportunity. The study through a case study of setting up of Phyllanthus amarus MP semi-processing unit at Khirvire village, Akole Taluka, Ahmednagar District, Maharashtra showed that careful financial planning needs to be done before setting up any small-scale herbal industry.

Accordingly, a higher subsidy from NMMP will not necessarily mean favorable financial plan. Further, various parameters namely RMCC, ET and LP could play a role in determining the feasibility of the financial plan. Finally, NMMP scheme is more favorable for

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economically weaker sections than others but the system is needed to help those people to develop a good financial plan for benefitting from NMMP scheme.

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