REPORT

"To Study the Cultivation / Collection Practices and Market Analysis of Ashwagandha, Aloe-vera and Aonla in the State of Telangana"



Report Submitted to

National Medicinal Plants Board, New Delhi

Submitted by

CCS National Institute of Agricultural Marketing

Kota Road, Bambala, Pratap Nagar
Sanganer, Jaipur -302033

To Study the Cultivation /Collection Practices and Market Analysis of Ashwagandha, Aloe-vera and Aonla in the State of Telangana

Research Team

Dr. Sattram Singh, Principal Investigator

Ms. Dyuti De, Consultant

July, 2020

Printed at:

Tituprint

F-58, Malviya Industrial Area,

Jaipur, Rajasthan-302017.

Prepared By:

CCS NATIONAL INSTITUTE OF AGRICULTURAL MARKETING

(An Autonomous Organization of Ministry of Agriculture and Farmers' Welfare, Government of India)

Kota Raod, Bambala, Pratap Nagar, Jaipur-302033, Rajasthan

www.ccsniam.gov.in

Dr. P. Chandra Shekara
Director General

Foreword

Medicinal and aromatic plants derivatives are playing a very important role in our life by providing various daily use items like medicines, house hold cleaning agents, confectionaries, pharmaceuticals, cosmetics and neutarceuticals and many more. In India, there is a great opportunity for cultivation of these flora due to availability of conducive environmental conditions. The present study entitled *"To Study the Cultivation /Collection Practices and Market Analysis of Ashwagandha, Aloe-vera and Aonla in the State of Telangana"* conducted by CCS NIAM to know more about the marketing, processing and business opportunities in the Telangana state. It is known fact that marketing of medicinal and aromatic plants are very grey area and most of the farmers are not aware about the actual source of marketing.

The present study conducted by CCS NIAM will be a useful tool to the researchers, scholars, official, government institutions, marketing personnel and Marketing Federations. The report will also be helpful to the tribal people, traders, primary processors and cooperative societies dealing with the marketing of aloe-vera, aonla and aswhwagandha. At this point of time more emphasis can be given with a focus on marketing of medicinal and aromatic plants. Marketing is one of the way by which income of farming family, especially tribal people, can be enhanced by providing more access in the market to the farmers and other stakeholders in a transparent manner.

I am certain and hopeful that this study would make significant contribution in providing insight of marketing of medicinal and aromatic plants in the country in general and Telangana in particular. I am sure this report would benefit all the stakeholders and contribute to enhancing the income and living standards of tribal farmers.

Dr. P. Chandra Shekara
Director General
CCS NIAM, Jaipur

ACKNOWLEDGEMENTS

The idea of conducting the present study entitled *"To Study the Cultivation /Collection Practices and Market Analysis of Ashwagandha, Aloe-vera and Aonla in the State of Telangana"* coined in the Annual Board Meeting held in the NMPB office at New Delhi in the month of August, 2017. The meeting chaired by Ms. Shomita Biswas, IFS, the then Chief Executive Officer, NMPB and Ms. Irina Garg, IRS, the then Director General, CCS NIAM and undersigned attended the meeting to explore the opportunity for consultancy project. The representative of others states were also attended the meeting. In consequence of the discussion in the meeting the proposal for conducting the present study coined by Ms. Sonibala Akoijam, IFS, CEO Telangana Medicinal Plants Board. After that a research outline emerged through a discussion with respective state.

On behalf of CCS NIAM, I would like to thank Dr. P. Chandra Shekara, Director General, CCS NIAM for constant help and encouragement time to time during the study and also provide all kind of freedom in conducting the study and continuous support to bring the study to a logical conclusion.

I would also like to thank to Ms. Shomita Biswas, IFS, CEO, NMPB and Dr. Padampriya Balakrishnan, IFS, Dy. CEO, NMPB, New Delhi for their continuous support and guidance time to time during the project.

I would also like to thank to Ms. Sonibala Devi Akoijam, IFS, Chief Executive Officer and Sh. A. Venkateshwarlu, Dy. Chief Executive Officer, TSMAPB, Hyderabad for extended all cooperation and continuous help in collection of data from the field and making arrangement of the stakeholders meeting time to time during the study.

I would also like to thank to Ms. Irina Garg, IRS, Principal Commissioner (Income Tax) for his continuous support to the study when it was only in thought process encourage right from the beginning and providing valuable input in designing the schedule for data collection. She was actual planner of the study and constantly provide the valuable suggestions, new ideas and guidance required for the study.

I would also like to thank to Dr. J. L. N. Sastry, Chief Executive Officer, Dr. S. S. Koranga, Consultalt, Dr. Naresh Kumawat, Research Officer and Mr. Saurabh Sharma, Manager (Marketing) from National Medicinal Plants Board, New Delhi for their consistant support and guidance extended time to time during the study.

I would also like to convey my gratitude and thanks from my bottom of heart to all stakeholders, NGOs, Cooperative Societies, local market personnel, factory owners, processors, traders, mandi secretary, commission agent, traders, Farmers, Farmers Producer Organizations they have been very supportive and helpful during the data collection from the field by the research team.

I would also like to thank all faculty members and staff of CCS NIAM for constant support during the study and thanks to everyone who made efforts and contribute in any ways in completion of the study.

At the end, I am of the opinion and trust that this study will be helpful in to the state, researchers, stakeholders, scholars, FPOs and other organizations of the country and contribute in strengthening the medicinal and aromatic plant industry in India.

CCS NIAM, Jaipur (Dr. Sattram Singh)
July, 2020 Principal Investigator

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report titled **"To Study the cultivation / collection practices and market analysis of Ashwagandha, Aloe-vera and Aonla in the state of Telangana"** is prepared based on the detailed study conducted by CCS National Institute of Agricultural Marketing, Jaipur. The responsibility of study was given by National Medicinal Plants Board, New Delhi for study of plants like Ashwagandha, Aloe-vera and Aonla in the state of Telangana. The major points observed during the study are depicted as under:

1. The study was conducted to understand the various dimensions of the marketing of Ashwagandha, Aloe-vera and Aonla in the state of Telangana. This is known fact that demand of medicinal plants substances are increasing globally due to changes in consumption pattern of consumers and they understand that use of these substances are safe for health and body.
2. However, during the study it was found that farmers from Telangana are facing difficulties in marketing of their produce due to lack of knowledge of marketing channels, packaging, grading, storage, collection process, primary processing and many more.
3. **Market Growth of Aromatic and Medicinal Herbs:** The market of aromatic and medicinal herbs are estimated to touch around US $ 2 trillion by 2020 and US $ 5 trillion by 2050 thereby making this sector one of the fastest growing sectors and full of opportunities to the traders, farmers, middlemen, processors, manufacturers and other stakeholders. Since Telangana is located in the middle, the benefit of location and market may be taken by the state
4. It is observed that aloe-vera, aonla and ashwgandha plants are not only a major resource base for livelihood support through sustainable ecological balance and by providing technical support in terms of backward and forward linkages for better marketing of medicinal plant products.
5. There is a lack of access to markets for the farmers engaged in the collection /cultivation of medicinal plants they do not get fair value/price for their products due to over dependency on the middleman, aggregator and collectors of medicinal plant produce from the wild sources as well as cultivation.
6. Due to lack of documentation of gathering process of medicinal plants and the damage to the eco-system by over exploitation, the exact potential and its real

issues has not been assessed. Under this project market analysis has been done for Ashwagandha, Aloe-vera and Aonla.

7. The existing value chain of identified medicinal plants was studied to know the gaps and add suggestions for appropriate measures in the area of grading, packaging, value addition and market linkage..

8. A huge opportunity awaits the indigenous Indian pharmaceuticals, to be availed through innovation, patents and trademarks. Telangana has enormous resources of medicinal and herbal plants, in spite of that Telangana is lagging behind in terms of market linkage.

9. In 2016, the government announced that India's share in the global herbal medicinal market is only 0.5 % owing to lack of financial support and improper business planning. Herbal drug trade is secretive and unregulated. To study the present cultivation and collection practices and finding necessary gaps in present scenario.

10. Ashwagandha is slowly pulling up in the dietary supplement market in recent times due to increase in consumer awareness and acceptance of naturopathy. Ashwagandha market segmentation is done in three ways namely form, application, distribution channel and region Telangana. By distribution channel, *Withania somnifera* market is segmented as direct sales and indirect sales.

11. **It has been observed that m**ajor market players in the global market manufacturing *Withania somnifera* include are Himalaya Global Holdings Ltd., AuNutra Industries Inc., Amax NutraSource, Inc., Carrubba Inc., Sabinsa Corporation, and Banyan Botanicals among others. The key players are focusing on developing natural products for attaining growth in *Withania somnifera* market and try to capture major market share. Six major industry is working in Telangana

12. The global Aloe-vera extracts market revenue is anticipated to expand at a CAGR of over 7.7% in terms of value and 7.4%, in terms of volume during the forecast period. Factors such as increasing trend of consumers towards healthy lifestyle, coupled with increased usage of Aloe-vera extracts as an ingredient by food, pharmaceutical and cosmetics industries is fuelling market growth across the globe.

13. India aloe-vera products market is projected to surpass $242 million by 2022. Growth is expected to be driven by rising concerns among consumers regarding their health and skin problems.

14. Major players operating in India aloe-vera products market are Patanjali Ayurved Limited, Dabur India Ltd., Shree Baidyanath Ayurved Bhawan Private Limited. The Himalaya Drug Company, Brihans Natural Products Ltd., Aloe Veda Personal Care, Aloe-vera India, Khadi Natural, Forest Essentials, Nature's Essence Private Limited, FabIndia, MSG All Trading International Private Limited, Bright Life care Private Limited, Rattan Organic Foods Private Limited and Nourish Vitals, etc.

15. Aonla powder is used in many hair tonics as it enriches hair growth and hair pigmentation. It strengthens the roots, maintains colour, and improves luster. Eating fresh gooseberry or applying its paste on the roots of your hair improves hair growth and colour.

16. Effective production, processing and marketing of aonla extracts is expected to boost the market size during the forecast period. Biomax, Taiyo international (SunAmla), Arjuna Natural Extracts Ltd., Nutra Genesis and Archerchem are some key players in the aonla extract market also serving in Telangana.

17. Key players identified across the value chain of the global aonla market include the Green Labs, Nutra Green Biotechnology Company Private Limited, Nexira, Indena S.P.A, Mountain Rose Herbs, Dabur India Limited, Himalaya, Patanjali, Zandu and Vaidhyanath and others. The companies are expected to expand their business by enhancing their product portfolio in global market.

18. Important local market players Telangana state are Bhaskara Bio-tech Pharma Company, Arogya Rama Genetics, Biomax, Youngever and Mediherbz. These companies are based at Hyderabad and providing the local support to the farmers because they are buying the raw material of various medicinal crops including Ashwagandha, Aloe-vera and Aonla directly from the farmers.

19. In the Telangana a local value chain persist in the area where the crop is being grown. Farmers are getting Rs. 130-150 per Kg for dry Ashwagandha roots to the middleman. The middleman sold the same raw material to the wholesaler by adding 20-30% profit margin and the same material goes to the pharmaceutical companies working in Hyderabad.

20. During the visit in the field area it has been found that a Suguna Chicken Company and Womcub Chicken Company are adding Ashwagandha powder and *Andographis peniculata* powders in the chicken feed so that more healthy egg and chicken can be obtained.

21. The price realised by the companies of the products are quite high and depends on the quality of products like Ashwagandha powder, tonic, power-pills, syrup and lapnum, soap, gel, syrup, face cream, shampoo, pharmaceutical product, Triphala churan, Aonla candy, murabba, pickle and chutney. The margin of the products are sometime more than 300-500% because of value addition and processing of product by the companies.

22. **Marketing Channel-**The analysis of the collected data reveals that, there is only one principal channel or route through which medicinal plants marketed from the producer (farmer) to the manufacturer. The major channel of distribution of selected crops observed as producers-collectors-traders-manufactures.

23. Important observation made from the field visit is that, selected plants marketing, decentralized marketing channel is in effect in the selected study area where the middle men or wholesale purchasers purchase directly from the farmers in absence of physical market. Begham Bazar in Hyderabad is working as major market of MAPs.

24. Various forms for production of other value added commercial products such as production of Ale-vera Juice, Aloe-vera hair oil, Aloe-vera skin care oil, Kumkumadi Thailam Aloe-vera gel ,Aloe papaya gel Aloe saffron gel ,Aloe menthol gel Aloe-vera beauty soap, Tulasi soap, Aloe- Triphala Capsules, Aloe vera shampoo, Aonla and Ashwagandha hair oils , gels, and shampoos in combination of sandal, rose and hibiscus. Price realised at various stakeholders' level in the marketing channel (Rs. /kg) in Telangana state

25. Aloe vera raw material price at producer's level is in the range of 5-6 per kg. The same material collectors are selling in the range of Rs. 10-12 per kg and traders selling at Rs. 14-19 per kg. After value addition at the manufactures level the different end products realising prices in the range of Rs. 300-5000 per one kg of Aloe Vera. Aonla farmers are realising 70-100 per Kg raw material, collectors-Rs. 100-150 and traders-Rs.160-170 per kg whereas manufactures

realising around Rs. 500-2500 per kg/lit after value addition. Even Ashwagandha also in the same line.

26. Market margin and Price Spread: Marketing margin assists in understanding the difference between the price paid by the consumer and that obtained by the producer at the Farm gate. It is also shows the difference in price of a commodity at different stages of the marketing system. Whereas commodity-price spread explains the difference between consumer and producer prices. The spread includes the marketing cost incurred by the intermediaries as well as their margin. Price spread analysis not only shows the marketing costs and marketing margins at different levels of marketing by different marketing agencies or channels but also show a clear picture of the entire system of marketing.

27. The experience shared by Sh. Kasarala Jayachandran Reddy, Farmer from village Kanchanpally, Mandal Nalgonda, he informed that Aonla is cultivated in Medak, Rangareddy, Mehaboob Nagar and Nalgonda District of Telangana.

28. The area of about 4000 acre old plantation is spread over in these districts, however, 300 acre area of new plantation of Aonla was done during last year. It has been observed during the interaction with the farmers that market is a big problem faced by the farmers since last 3-4 years. The intercropping was done by the farmers in Aonla plantation by planting white sandal wood trees in the field and red sandal wood trees near the boundary of the field. Sh. Jayachandran Reddy is growing NA-7, NA-10, Kanchan (NA-4) and Krishana (NA-5) varieties of Aonla in the field. However, a local variety BSR-1 is also available but not advisable due to small size of fruits. As informed by the farmer the market is available for Aonla in the district of Srikakulam, Vijayanagaram, Vishakhapatnam, Khammam, Guntur and Prakasam districts of Telangana.

29. However, farmers are also selling Aonla fruits in the local market of Nalgonda. Basically, it is a fruits and vegetable market but the buyers of Aonla also arrived to buy Aonla from this market. The rate of Aonla fruits was given to the farmers is Rs. 30/-kg.

30. The local value chain of Aonla persist in the area which is look like – farmer (Rs. 20-30 per kg), middleman (Rs. 30-40 per kg), Big retailer (Rs. 40-50 per kg) and sometime Aonla is sold @ Rs. 1 per piece after dipping in the solution

of salt. Sweet Candies also prepared by some local people and sold out on the local shop because it is very favourite to the children.

31. It is also informed by the farmer that the Aonla in the Telangana is also transported to the nearby state like Odisha and Jharkhand. The Aonla fruit is dipped for a week in a home-made solution of Salt, Turmeric, Chilly, and water solution after giving some cuts in the Kali of Aonla. In doing so, the self-life of Aonla is increased from 6 month to 1 year and used by the local people as a pickle during the meal time. It is being sold by the local shopkeeper @ Rs. 1-2 per piece.

32. It is noticed during the discussion that a very nominal cost of Rs. 3000 per acre is required for plantation of Aonla and it starts fruiting after 3-4 years. As informed by the farmer, he is getting Rs. 50000/- per acre profit from 1st harvest and Rs. 30000/- per acre from the 2nd harvest of Aonla. It means farmers are getting Rs. 80000/- net return in a year from one acre piece of land. Generally two harvests are being taken by the farmers in a year. He said that there is no problem of marketing of Aonla in our region because buyers from nearby states as well as from Telangana came frequently to purchase fresh Aonla.

33. A case of Sh. Janardan Reddy from Rangareddy District of Telangana depict that Aloe-vera is being cultivated in Rangareddy, Medak, Nulgonda and Mehaboob Nagar district of Telangana. The initiative for extension of Aloe-vera crop in these districts was taken by Sh. Janardan Reddy with the support of Telangana State Medicinal & Aromatic Plant Board, Hyderabad. The initiatives was well taken by the farmers and in a sort period the crop has been extended in the area of 1100 acre with a buy back arrangement with Patanjali, Hardwar. As stated by the farmers 35-40 tones fresh leaves can be obtained from one acre of land if all good conditions prevails.

34. The buy-back arrangement for fresh pulp @ Rs. 21/- per kg was exercised between the group of farmers and M/s Patanjali Ayurved Ltd. Hardwar. As stated by the farmers, an agreement was done between both the parties with a condition that both will save the interest of each other. The 11 month duration crop, as observed during the field visit, was ready for harvest. However, no one could turned up from M/s Patanjali Ayurved Ltd. Hardwar to make an arrangement of purchase of Aloe-vera crop as per agreement.

35. It was also observed that farmers were in a great trouble that a company like M/s Patanjali Ayurved Ltd. Hardwar is not come forward to purchase the crop of Aloe-vera ready for harvest. At this stage it is very pertinent to advise to the government to have an agreement between small companies working in the Telangana state so that this kind of situation could not prevailed. Sh. Janardan Reddy is a progressive farmer and a strong political leader, in spite of that the condition of marketing is beyond his reach. Here government handholding is required to safe guard the interest of farmer otherwise the crop will finish quickly from the area.

36. The cost for installation of powder making unit is around Rs. 15 crore, hence, the unit should be installed with the financial support from the State/Central Government enabling farmers to get higher price of their produce. The installation of dry powder making unit is beyond is reach of small firms and industries working in that areas as the financial investment is quite high.

37. It was also observed from the field that farmers are growing local varieties of Aloe-vera intercropping with local varieties of pulses called as Uluvacharu which is used for making sambhar a local dish. There is no fat and sugar in the local varieties of pulses, it is opined by the farmer Sh. Buchuramulu, Village Kothularam, Mumugondu Mandal District Nulgonda.

38. The local market of Ashwagandha, Aloe-vera and Aonla is available in and around Hyderabad those are hand holding with the farmers and support in procuring the raw material direct from the farmers. Important local market players are Bhaskara Bio-tech Pharma Company, Arogya Rama Genetics, Biomax, Youngever and Mediherbz.

39. Bhaskara Bio-Tech is in manufacture and sale of highest quality aloe-vera products. These are aloe vera based health, beauty and personal care products and main aim of the company is to spread better health and beauty by using aloe-vera products. Company is also engaged in growing and manufacturing of aloe-vera crops as well as products development and have a complete range of aloe-vera products. Procurement is done from the farmers as well as from the wholesaler from Beghum Bazar, Hyderabad.

40. Arogya Rama is a Self Help Group of Farmers working in Medchal and Rangareddy District of Telangana under the leadership of Sh. Rameshwar Reddy. Arround 50 farmers group are working under one umbrella and each

group having 20-25 farmers in a group. The raw materials of different medicinal crops like Ashwagandha, Aloe-vera, Aonla, Safed Musali, Tulsi and Guduchi are being procured by Arogya Rama directly from the farmers and there is no intermediaries in the value chain.

41. The present value chain is giving the opportunity to the farmers for direct sale and they are getting 15-20% value of their crop in comparison to the rates prevailing in the market. Sh. Rameshwar Reddy, the group leader opined that Arogya Rama is trying to expend the business in other district also because various farmers of nearby district approaching us.

42. **Bio-Max** Company is a leading innovator and manufacturer of nutraceuticals, standardized herbal extracts, spice oleoresins, natural colours, fruit & vegetable powders used for dietary supplements, pharmaceuticals, cosmetics, etc. promoters of BioMax have a strong pharmaceutical manufacturing experience and successfully promoted Matrix Laboratories and BioMax Fuels.

43. Youngever, the company is diversified into Manufacturing of Herbal & Ayurvedic Products having brand name of YOUNGEVER (Nature Solutions). The company is manufacturing different kind of health product segment like juices, oils, gels and creams, handmade soap, bath powder, tooth powder, shampoos, soap, powder, honey herbal pack, hair pack, hair treatment kit and tablets and capsules.

44. Mediherbz is a registered company and a cottage industry established in 2008 and working in Hyderabad. The company has full flagged manufacturing process of various kind of herbal products like skin care product, body care, bathing scrubs, face pack, shampoo, herbal mehndi, rose water, herbal hair oil, triphala churn, all-purpose cream, joint pain ointment, pimple care packs, soap, pigmentation marks cream etc.

45. Telangana State Girijan Cooperative Corporation Ltd is working under the Tribal Welfare Department, Govt. of Telangana in different areas like procurement of minor forest produce, seasonal agriculture produce, distribution of agricultural commodities to the tribal people, supply of food provisions and cosmetic items, value addition and retail marketing and agricultural credit support. The agency is spread its wing in all Telangana State. In the marketing chain of the agency, there is no middle man in the value chain. Due to that tribal

people are getting higher price value of their produce in comparison to the value chain prevailing with the middle man.

46. All products are being manufactured in the brand name of Giri. The agency is procured raw materials not only Aloe-vera, Aswagandha and Aonla but also other commodities of Minor Forest Produce and hand holding the tribal peoples. Agency is also providing marketing support to the tribal people and procured the raw material with the depot established in the remote areas.

47. Local Market of Medicinal Herbs: Begum Bazar, Hyderabad is a common and local market for buying and selling of Herbal raw material. In this local market various small, medium and large exporter and importers are working and engaged in procurement of different herbal raw material sourced from different part of the country. The farmers, tribal people and middle man are also come to meet out their requirement of herbal raw material like Aloe-vera, Aonla, Aswagandha, Soapnut, Tejpat, Cinnamon, other spices, gums, dry fruits and other Ayurvedic and Unani raw materials. During the visit to the market the interview was arranged at the shop of Sh. P. Ashok Kumar, the owner of M/s P. Kishan Lal Ashok Kumar, Exporter & Importer of different herbal product. It was informed by the owner that herbal raw material procured from farmers, tribal people, forest dwellers and sometime herbal raw material are also procured through auction arranged by the forest department time to time in a year.

48. **Marketing of Aloe-vera at road side:** During of the visit of Nalgonda District Headquarter with the Extension Officer of Telangana State Medicinal & Aromatic Plants Board, it was observed that a vendor was selling juices of different taste in combination with Aloe-vera juice. It was new marketing initiatives observed at the road side under the banner of SSF Natural Drinks in a kiosk. Different kind of juices mix with Aloe-vera like Basil, Mint and lemon were available in the kiosk. There was lot of foot fall of the people walking through the road and were enjoying the healthy drink.

49. The owner of the kiosk interviewed and opined that fresh Aloe-vera leaves procured from Chennai @ Rs. 30/kg including transportation and other costs. The owner of the kiosk was not aware that the Aloe-vera is being cultivated in Nalgonda district itself. During the interview it was informed that he may purchase the fresh Aloe-vera leaves from the local farmers growing Aloe-vera

in Kothularam village at cheaper price. He was selling Ale-vera juice with different flavour @ Rs. 40/- per glass and 1 ltr. @ Rs. 100/-. It can be a new marketing initiatives for Aloe-vera if a network is developed with the local farmers those are growing Aloe-vera in the area. It was appraised to him if he purchased fresh Aloe-vera leaves form the local growers he can not only minimise the cost of procurement but also will be a tool of marketing to the local growers and procure the fresh leaves form the local growers at a cheaper price say Rs. 15-20 per kg. This kind of small initiatives can enhance the local consumption of Aloe-vera in tern the demand of fresh Aloe-vera leaves will be increased. This kind of kiosk can be open up at the level of district headquarters with a connectivity of local growers.

50. Aloe vera is sold in traces in all major markets. As per our chosen market, Kolkata and Hyderabad did not update its data. Therefore, analysis is done with data collected from Neemuch, Mumbai and Delhi. Mumbai has the highest average price of Rs. 34.40 per Kg closely followed by Neemuch market having the average price of Rs. 33.46 per Kg. The Delhi market on the other hand is reasonable in price on the lowest average price of Rs. 31.17 per Kg. If we see the individual price in the three markets from 2016 to 2017, we see that only Neemuch has 7 month when price is lower than average.

51. It is observed from the analyse of the given data of the average price of Aloe-vera per kg throughout India are lowest average prices in the Jan-March Quarter and highest in the October-December Quarter followed by the July-September Quarter and April-June Quarter. Although on an average, the price fluctuation is not too much throughout the year.

52. August to November is the best price-receiving period for the growers. The average price during this period is more than the average price of rest of the year. The average price in India is Rs. 33/ kg. Aloe-vera is sold in these markets after the initial processing of drying or extracting. Hence, the price does not depend on the harvesting season. But it should also be noted that the high price period of August to December is because traders prefer buying fresh material of the season. According to few traders at Neemuch mandi, the reason of a dip in price in July, when traders preferred waiting for a month for new arrival.

53. For Aonla, instead of Kolkata here Chennai has chosen as the fourth market due to availability of data and similar size & traits of market. For Aonla too

Telangana did not update the price list. As a result, the four samples chosen market are Chennai, Delhi, Neemuch and Mumbai.

54. Though Chennai has the highest price it is noted that only four months have higher price than average price in this market. The market average went high due to excessive demand in last April. The median price is Rs.72.5/- still making it higher than the other markets. Now viewing the data for Mumbai, it is found that that exactly 6 months have higher price than average of the market. The median price here is Rs.70.00/- indicating a fair stability in the prices. The third rank is Delhi followed by Neemuch. In these two markets, like Mumbai, exactly 6 months have price above the average price of the markets.

55. The blooming period in price is from December to April. In the month of May, the price fell one third to its price in April. The price stayed stagnant until September and from the next month, it grew to a significant change. It can be noted that Aonla price heavily depends on harvesting period. The lean months are in mid-summer season for both dried as well as fresh Aonla produce.

56. It is observed that Mumbai market is having the highest stability in the price. There is a steep downfall in the average process of Aonla after March due to decline in the demand of its applied products like Chyawanprash.

57. The best-demanded Ashwagandha is found in the dry soils of Rajasthan regions ie. Nagaur and other dry part of Rajasthan. Neemuch has placed itself as the market hub for ashwagandha roots in the country and majority of roots and other parts of ashwagandha is being traded through Neemuch mandi. Traders from all over the country come here to purchase Ashwagandha. It will be interesting to note the price comparison of Ashwagandha in Neemuch with the rest of the country.

58. The Chennai market has the highest price followed by Delhi and Kolkata respectively. The main reason for such high gap is the fact that traders first sale their produces at Neemuch mandi. From Neemuch mandi again, the material is supplied to rest of the country.

59. Hyderabad market price is different from Neemuch market. For the same data is considered in four samples. The first sample is from November first fortnight followed by second sample as the second fortnight. The third and fourth samples are the two fortnights of December.

60. It is represents that there is a significant difference in price of Ashwagandha between Hyderabad market and Neemuch market. It is evident that Hyderabad market is very costly compared to Neemuch market. Due that reasons, mostly buyers interested to bulk from Neemuch market as it offers lower price of produce. The average difference in price is Rs. 101.25 per kg which means Hyderabad sells Ashwagandha at a rate of 48% higher than what is sold in Neemuch. This is a clear suggestion that Hyderabad has scarce raw material and as stated above, the state level traders go to Neemuch and sell the same at Hyderabad. It has been reported by the major traders of Neemuch that the increase in demand has gone up to 50 % higher in Andhra Pradesh region.

61. However, Neemuch always have the least price of produce, the jolt in downtrend of price was felt least by this market. Delhi price went down from Rs.290.00 per kg to Rs.215.00 per kg.

62. The significance in this study is to estimate the demand in domestic market yearly growth. In this regard, consumption of the three produces will indicate the major markets and analyse the trend of Telangana in using these produces. The major potential markets for Telangana (in terms of consumption only).

63. Ashwagandha has substantial footprints in four states. In other states, the presence is negligible. Such high difference can be a result of either better herbal manufacturing units or resale point for other low procuring states. The striking results portrayed are by Delhi, Kerala, Uttarkhand, Karnataka and Tamil Nadu. These states are known as the herbal hubs of the country and Ashwagandha is used readily in many applications in Ayurvedic drugs.

64. The entire market of Ashwagandha in the country is accumulated in the 5 states with 96% consumption. Gujarat alone takes away a major chunk of nearly 32% closely followed by Uttar Pradesh and Himachal Pradesh. The growing markets of Ashwagandha are Punjab and West Bengal.

65. In two states namely Haryana and Uttarkhand, Aloe-vera finds Patanjali as a major buyer in Uttarakhand. Along with Patanjali there are numerous small-scale Aloe-vera processors found in Uttarakhand. As a raw material, only states with close distance from the producing field can afford to purchase the raw herb. Aloe-vera has highest value addition after processing than most of the other herbs. Hence it will be interesting to note that the average price of aloe

leaf in Uttar Pradesh is Rs.9.00/kg and in Himachal Pradesh is Rs. 4-7 /kg, whereas the national average price is Rs.16.37/kg.

66. Ashwagandha on the other hand has been steady in its growth with a marginal increment after 2012. Aonla consumers reflect the best potential of consumer growth. In last 4 years, the consumption has grown to almost 100% by quantity. 2013-14 has been a bumper growth year for Aonla as well as Aloe-vera, but Ashwagandha remained stagnant.

67. Telangana is in top ten lists for Aonla and aloe-vera with rank 7 but Ashwagandha has moved further to rank 11. The consumption share is less than 1% for all three produces. Although it might seem that Telangana has a higher rank than most of the states but as we have seen the major consumption is concentrated in a handful of states so to understand the real comparison it is essential to compare Telangana with top consumers of the country.

68. The growth trend of Ashwagandha from 2018-19 to 2022-23. The growth of Ashwagandha has been extremely weak with less than 1%. A similar trend is seen in both aonla and aloe-vera. This kind of trend is a reflection that in the recent years there has been no significant step taken to increase the consumption of these produces in the state. The market of these plants is still at a very nascent stage in Telangana and it requires better policy and infrastructure in the state to improve the prevailing condition.

69. Ashwagandha has shown a very optimistic result in the export market both in value and quantity. Even after having a good negative margin in per unit price it has able to create a favourable scenario due to heavy export quantity compared to its import quantity.

70. Telangana‘s competitive advantage in the southern herbal market: Telangana and other 4 states of south share many cultural resemblances the formal can definitely get an edge over other states. This factor has a higher influence in the unorganized sector where small traders and manufacturers have flooded the market and prefer to collaborate with people of likable thinking, business ethics and ethos.

71. Distance from the target market: This is one of the most important advantages for Telangana as most of the bulk procurements happen from distant states of Uttar Pradesh, Delhi and Madhya Pradesh. However, this advantage can be counted only if Telangana manages to provide bulk and good graded material.

In such scenario, the south Indian states will have an accessible market for raw materials in the vicinity. This is a great opportunity for the farmers as many a times they go until North to get a good price for their material.

72. Telangana has the potential to grow Aonla, Aloe vera and Ashwagandha in many regions due to its semi-arid conditions. The state is yet to tap full potential of cultivation.

73. Many factors contribute to easiness in networking and distributing in southern states for Telangana. Most large units reach out to the distributors and agents for material. In every value chain the efficiency is increased with better networking. The above three factors ultimately results in providing a better chance of networking for the concerned state. Even industry giants like Dabur approach their trusted dealers year after year for material procurement.

74. The biggest scope for Telangana in entering the south market is curbing the irregular procurement setup. Currently there are few clusters of herbal market but until now, the dependence of procurement is on Neemuch, Pratapgarh and other north Indian markets.

75. Village traders buy directly from the farms and bring them to district head from different blocks of the district. They sell the material in district shandi or contact district level or state level traders directly. They generally keep a margin of 1% of cost price for themselves.

76. The value chain of Ashwagandha in Telangana is inefficient majorly at three levels namely production, wholesale trading and manufacturing units. At production level, the farmers are still unaware of the best quality seeds of Ashwagandha, soil preparation and soil testing, organic fertilizer and pesticides. The wholesalers are approached by the middlemen with their samples of dried roots. Due to transportation of roots from distant villages to cities the root sticks of Ashwagandha gets broken, becomes wet due to mishandling till it reaches the wholesalers. The manufacturers of Telangana therefore prefer to buy from Neemuch and Mumbai rather than roots produced in the state. Also due to low connection with the producers and the presence of a series of middlemen in the value chain the accountability of receiving material on time is reduced. Aloe-vera is a highly perishable produce and it is difficult to transport Aloe-vera leaf without processing in far off distances. Therefore, most of the processing units

are either in the producers' districts or at Hyderabad outskirt manufacturing units.

77. Aloe-vera is traded mainly through buy back or contractual agreement among various players. The process starts at the higher end where a demand is placed by the processors to the lower level traders and intermediaries. The higher-level players for future demand contact the farmers.

78. **Processors:** This is the most important stage in the value chain as processing of Aloe-vera needs increases its value much higher than most other herbal produces. The processors are at state level as well as local district level. As it is highly perishable and storage of raw leaves is not available readily, the processing must be done soon after harvesting.

79. **Wholesale traders:** Wholesale traders are the bulk suppliers in various districts of Telangana. They are linked with either the intermediaries or farmers. At the state level, the middlemen approach the traders with the available material. The traders then negotiate on price and check the grade of the leaves before purchasing.

80. **Middlemen:** The middlemen are the main connectors between farmers and other higher value players in Telangana.

81. The biggest inefficiency in Aloe-vera value chain is low price received by farmers in Telangana state. The highest value addition in Aloe-vera value chain happens during processing. Out of all medicinal plants the farmers share in consumer price is least at present for Aloe-vera. The demand for Aloe-vera in drug and cosmetic industry is increasing everyday but in the form of extracts and gel.

82. The farmers bring in small quantity of Aonla in dried form in the vegetable market. The local traders make their bulk procurement by buying from each of these farmers in the market. The wholesale traders send the material to the processors and finally the retail outlets sell the packaged products to the customers.

83. Inefficiency in Aonla value chain: The Aonla value chain faces some common problems faced by medicinal plant based parts and a few specific issues to Aonla fruit. Lack of wholesale market accessible to the Aonla growers. Their requirement is seasonal and in bulk quantity. Individual farmers find it difficult to fulfil such requirements, and this cavity of reach is filled by the aggregators.

For example the farmers in Telangana reported to grow only traceable amount of Aonla due to low price, no storage and lack of regular market.

84. Telangana has a varied forest area and a number of dwellers who collect wild Aonla as a source of their livelihood. After Telangana is separated as a different state, the collection of wild Aonla is mainly happening under Girijan Cooperative Corporation. Aonla can be found in the form of cultivated as well as a minor forest produce. Purchasing Minor Forest Produce (MFP) and Agricultural Produce (AP) from them at reasonable and fair prices.

85. Cooperative is still using manual techniques for deseeding Aonla in Telangana and Andhra Pradesh. The pulp extraction machine used by private sector organisation is still alien to the organization.

86. The role of tribal in the process is restricted to collection and deseeding of aonla. The collectors of NTFP are allowed to sell the collected produces only at GCC centre. The collection involves men, women and children, as their livelihood is dependent on NTFP for this period of the year.

87. The tribal requires proper training and capacity building about the wild Aonla collection and deseeding techniques so that hygiene and efficiency can be increased. They need to be made aware of the exploitations done by traders. The forest department and GCC must build an institution of trust with the tribal. The tribal people must be involved in many regulatory activities to curb illegal trading. The involvement of forest department must increase for conservation of NTFP and sustainable collection. GCC and forest department should collaborate at every stage of collection process.

88. The biggest market of aonla wine is Mumbai and Delhi where people having higher disposable income and bringing in new life style changes prefer consuming wine. Now cities like Hyderabad, Bangalore and Nashik are an emerging market due to growth in IT industry in these cities. Nearly 80% of total wine sale is estimated in these states only.

89. Aonla wine, being a domestic player, has to repackage itself with competitive taste, health benefits and attractive packaging. A good example can be set by M/s Vijay Durga Wineries selling aonla wine under Elixir brand in different states. To maintain a balanced taste it emanates in many flavours like pineapple, grape, apples, strawberry and banana in both sweet and dry forms of wine.

90. Telangana has separated from Andhra Pradesh very recently. With the segregation of the state, many challenges erupted at industrial and policy level. The state now requires new reforms and funding to address the challenges. The unorganized nature of herbal sector has added more complexity than other commercial fraternities.

91. The unavailability of regular market is the major reason of low marketability of material at this stage of supply. The middlemen exploit the farmers by consuming a chunk of the share of value from them. These intermediaries establish relationship and trust with the farmers and price given by them is not validated by the producers through other sources. The result of low price lies in the deviation of production of bulk herbal material.

92. Constraints & challenges in Telangana: The herbal sector concerning aloe-vera, aonla and ashwagandha of Telangana is facing a number of challenges, which results in poor contribution of the state in this segment. The sector is constrained by low productivity, high cost of production, lack of post-harvest infrastructure resulting in huge post-harvest losses, inefficient &fragmented supply chain, lack of knowledge and poor market access, low productivity, traditional farming, ignorance about improved package of practices, irrigation facility, and skilled labour is also a problem.

93. Farmers are not trained to carry out sorting and grading of the concerned produces. The aonla producers sell their material in bulk right after production in fear of getting perished. The ashwagandha cultivators are unaware of how to segregate the roots according to the grading system of the market.

94. Capacity building of farmers on improved production technologies and better farming practices: Farmers are unaware of the techniques and good agricultural practices of medicinal plants. For addressing the issue, demonstration plots should be created at block level to show case better production methodologies.

95. Many farmers in Telangana depends on the middlemen and local shops to procure seeds and other input supply. As a result, they land up using inferior quality seeds giving low yield. The better varieties of seeds should be made available to the growers at a competitive price.

96. Fast changing scenario of medicinal plant cultivation demands skilled technical manpower in the production land. This manpower should have knowledge and skills about farm machineries, post-harvest equipment, input supply sources,

and seed variety. To achieve the same the state should promote skill development through various training programmes.

97. During the interaction with traders and farmers it has been found that farmers are mainly expected to carry out grading, cleaning and sorting. In case of Aonla the farmers deseed and dry the fresh Aonla before bringing in to the market. Due to lack of awareness the farmers are unable to perform these tasks efficiently. Therefore, they need to be trained on proper post-harvest techniques.

98. Medicinal plants undergo a series of operations after harvesting such as cleaning, sorting, grading, drying, winnowing, bagging, storage etc. before they reach the traders or consumers. There are appreciable losses in these stages. The existing gap in infrastructure results in inefficient market operations and high transaction costs. It is therefore necessary to put in infrastructural facility in the production area.

99. **Market intelligence system:** marketing information helps farmers to optimize their marketing decisions of where to sell, when to sell and at what price to sell. Currently, the medicinal commodities information can be found in e- Charak and medicinal plant WhatsApp groups. These needs to reach the farmers, who are unaware of these facilities. The daily price of all medicinal commodity market wise should reach the farmers.

100. **Establishment of collection centres and terminal markets:** There is no regulated and organized market in Telangana for medicinal plant produces which results in unhealthy and unscrupulous practices reducing market charges and providing facilities to the stakeholders. This at times results in short weighment, excessive market charges, unauthorized deduction, adulteration of produce etc. It is therefore suggested to establish regulated/organized markets with necessary infrastructure and facilities.

101. **E-auction centre:** E auctioning provides a platform for remotely located farmers to connect with major markets of the country.

102. **Brand enhancement of GCC and establishment as a wild aonla processing unit:** GCC has a huge untapped potential that can be achieved through proper management and business strategy.

103. **Enhancing farmer's income through forward linkage:** The role of the farmers needs to strengthen through forward linkage. The farmers can receive a better price of aloe-vera if it can sell after processing. Such infrastructure needs

to be established at production site. This can be feasible only if production takes place in huge quantity. Therefore, it is important to create clusters of production in each district for a particular produce according to farmers' interest and soil suitability.

104. **Centre for clinical trials and research laboratory:** A centre for carrying out research on medicinal produces needs to be created at the capital city of Telangana. The centre will have research clinical laboratories, documentation centre, conduct research on marketing and develop ICT facilities.

105. **Capacity building of farmers on improved production technologies and better farming practices:** Farmers are unaware of the techniques and good agricultural practices of medicinal plants. They lack of knowledge about production requirement required in the drug industry. For addressing the issue, demonstration plots should be created at block level to show case better production methodologies to produce good quality of raw material for the industry.

106. **Replacement of low yielding varieties:** Many farmers in Telangana depends on the middlemen and local shops to procure seeds and other input supply. As a result, they land up using inferior quality seeds giving low yield and poor quality of raw material. The improved varieties of seeds should be made available to the growers at a competitive price.

107. **Establishment of accredited nurseries for production of organic medicinal planting material:** The medicinal plant requires to be organically produced to meet the requirements of neutraceuticals as well as medicinal markets. Also it enhances the chances of export in other countries. Availability of disease free organic material should be available through a model organic nursery in each district producing medicinal plants in bulk.

108. During the interaction with traders and farmers it has been found that farmers are mainly expected to carry out grading, cleaning and sorting. In case of aonla the farmers deseed and dry the fresh aonla before bringing in to the market. Due to lack of awareness the farmers are unable to perform these tasks efficiently. Therefore, they need to be trained on proper post-harvest techniques.

109. **Post-harvest infrastructure in the production cluster:** Medicinal plants undergo a series of operations after harvesting such as cleaning, sorting,

grading, drying, winnowing, bagging, storage etc. before they reach the traders or consumers.

110. **Introduction of modern/ integrated pack houses:** For carrying out post-harvest activities for bulk production it is recommended to introduce pack houses in the state. The pack houses will have a receiving area for offloading and weighing. It will have cleaning equipment and mechanized rollers for sorting, mechanized washing/drying.

111. **Market intelligence system:** Marketing information helps farmers to optimize their marketing decisions of where to sell, when to sell and at what price to sell and whom to sell. Currently, the medicinal commodities information can be found in E-Charak and medicinal plant WhatsApp groups.

112. **Establishment of collection centres and terminal markets:** There is no regulated and organized market in Telangana for medicinal plant produces which results in unhealthy and unscrupulous practices reducing market charges and providing facilities to the stakeholders. This results in short weighment, excessive market charges, unauthorized deduction, adulteration of produce etc. It is therefore suggested to establish regulated/organized markets with necessary infrastructure and facilities for sell -purchase of medicinal plant products.

113. The role of Farmer Producer Organization is to transfer individual farmer risk to a collective entity and giving better price of raw material as the middlemen will be removed from the value chain. For individual farmer it is very difficult to bargain with big players of the market. Minuscule and scattered production is problem in the state. If farmers can come in to group will be powerful in comparison to one.

CHAPTER 1

INTRODUCTION

This report titled **"To Study the cultivation / collection practices and market analysis of Ashwagandha, Aloe-vera and Aonla in the state of Telangana"** is prepared based on the detailed study conducted by CCS National Institute of Agricultural Marketing, Jaipur as required by National Medicinal Plants Board, New Delhi and Telangana State Medicinal and Aromatic Plants Board, Hyderabad for the plants like Ashwagandha, Aloe-vera and Aonla in the state of Telangana.

The study was conducted to understand the various dimensions of the marketing of Medicinal Plants like Ashwagandha, Aloe-vera and Aonla in the state of Telangana. This is known fact that demand of medicinal plants substances are increasing globally due to changes in consumption pattern of consumers and they understand that use of these substances are safe for health and body. However, as we all know that in-spite of having a great demand, the marketing of medicinal plant is a very grey and complicated area and very difficult to understand the supply chain of the marketing. As a result farmers are facing difficulties in marketing of their produce due to lack of knowledge of marketing channels, packaging, grading, storage, collection process, primary processing and many more. A comprehensive 360 degree marketing strategy started from the scientific cultivation and collection of the herbs, appropriate and competitive pricing policy, appropriate selection of the distribution channel, products promotional strategy, primary processing, packaging, quality management system, supply chain Management, inadequacy of proper human resource availability which is an important aspect in the marketing of medicinal plants.

Market Growth of Aromatic and Medicinal Herbs: The market of aromatic and medicinal herbs are estimated to touch around US $ 2 trillion by 2020 and US $ 5 trillion by 2050 thereby making this sector one of the fastest growing sectors and full of

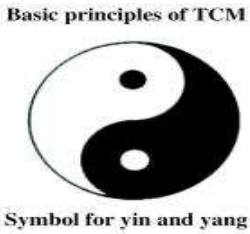
opportunities to the traders, farmers, middlemen, processors, manufacturers and other stakeholders. Medicinal and aromatic plants are not only a major resource base for the traditional medicine and herbal industry but also provide livelihood support through sustainable ecological balance and by providing technical support in terms of backward and forward linkages for better marketing of medicinal plant products. In some part of India, it is a back bone of livelihood for tribal people. The marketing system of medicinal plant products is grey and ambiguous and presently the channel of marketing of medicinal plant product is very opaque and unclear due to improper strategy since the sector is managed by unorganised sector.

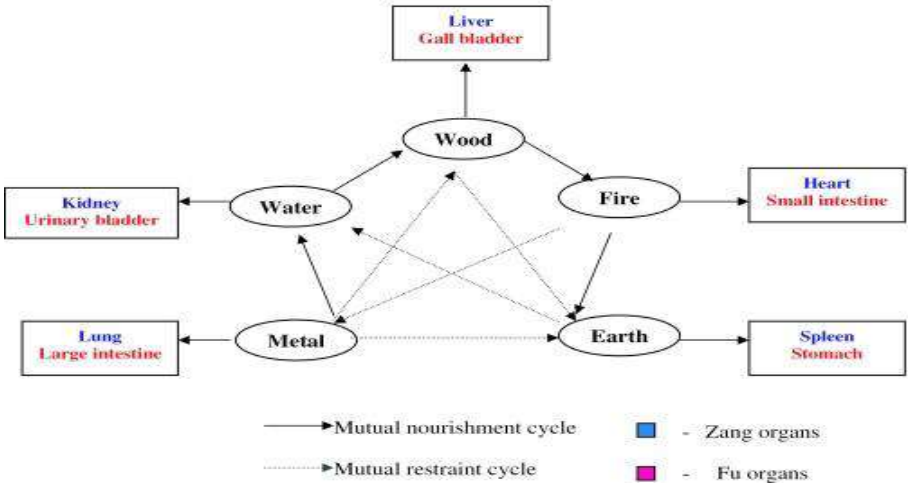
There is a lack of access to markets for the farmers engaged in the collection /cultivation of medicinal plants they do not get fair value/price for their products due to over dependency on the middleman, aggregator and collectors of medicinal plant produce from the wild sources as well as cultivation. Beside markets, the system is experiencing lack of information regarding inputs like quality planting material and necessary inputs, proper harvesting collection methodology for uncultivated resources, marketing channels, quality control, grading and packaging of products and post harvesting/cultivation processing. Due to lack of documentation of gathering process of medicinal plants and the damage to the eco-system by over exploitation, the exact potential and its real issues has not been assessed. Under this project market analysis has been done for Ashwagandha, Aloe-vera and Aonla.

Market survey was done to determine the demand of Ashwagandha, Aloe-vera and Aonla to establishing forward and backward market linkages through its integration and help in access market by the stakeholders. In this study effort has been made to identify present and potential market scenario of crops identified for the study, analysis of seasonal price fluctuations in different markets of Ashwagandha, Aloe-vera and Aonla in different market of the country. Extensive survey of area of cultivation/gathering of plants was done to collect the back ground information through structured schedules from various cultivation/wild, market areas of Telangana state as well as from some important mandies of India. The existing value chain of identified medicinal plants was studied to know the gaps and add suggestions for appropriate measures.

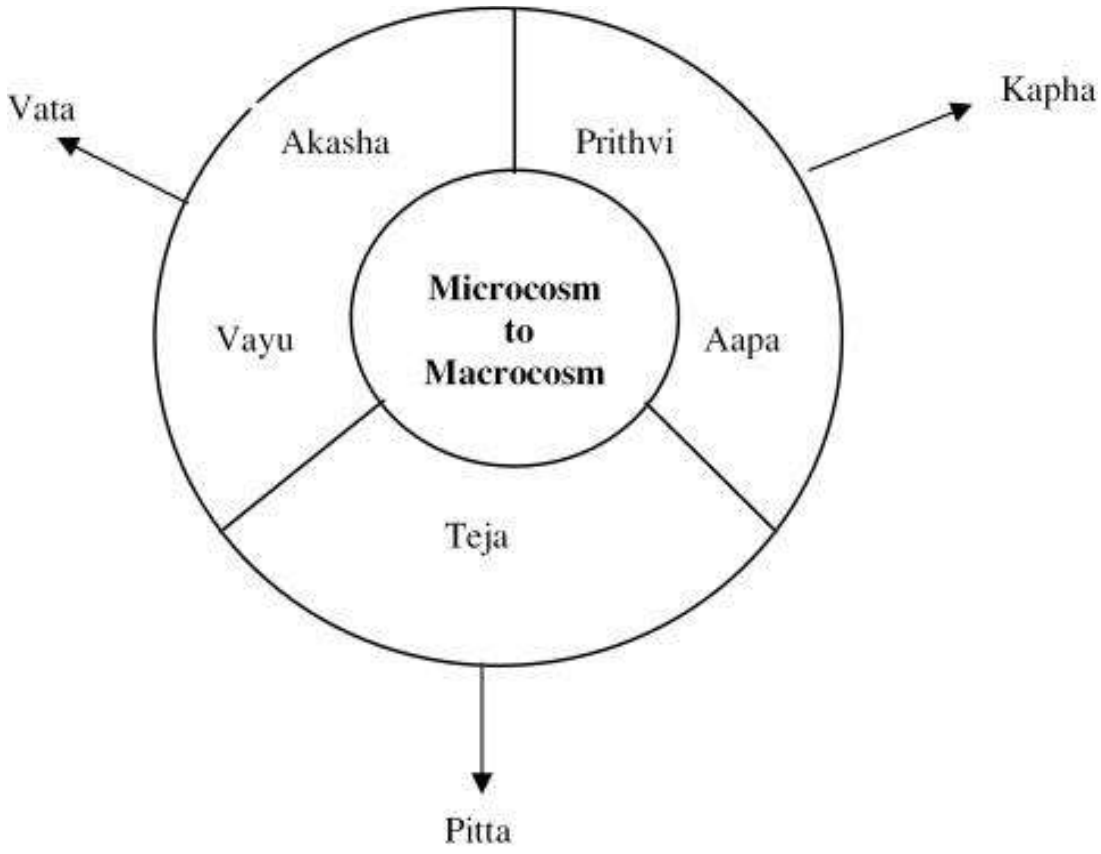
1.1 International market scenario of traditional herbal products with respect to India's performance

Ayurveda and TCM have many commonalities and similarities. The focus of both the systems is on the patient rather than disease. Both systems fundamentally aim to promote health and enhance the quality of life, with therapeutic strategies for treatment of specific diseases or symptoms in holistic fashion. Almost half of the botanical sources used as medicines have similarities; moreover, both systems have similar philosophies geared towards enabling classification of individuals, materials and diseases. TCM considers the human at the centre of the Universe as an antenna between celestial and earthly elements. The world is a single unit and its movement gives rise to yin and yang, the two main antithetic aspects. The actual meaning of the term yin and yang is 'opposites', such as the positive and the negative. However, Chinese believe that yin and yang is not absolute but relative. Consistent with the modern view of homeostasis, yin and yang are interchanged to meet the view that 'yang declines and yin rises' or 'yang is raised to produce a decline of yin'. The four bodily humours (qi, blood, moisture and essence) and internal organ systems (Zang Fu) play an important role in balancing the yin and yang in human body. Proper formation, maintenance and circulation of these energies are essential for health. When the two energies fall out of harmony, disease develops. The physician takes into account this concept while treating patients. Drugs or herbs are used to correct this imbalance of yin–yang in the human body.





Ayurveda considers that the universe is made up of combinations of the five elements (pancha mahabhutas). These are akasha (ether), vayu (air), teja (fire), aap (water) and prithvi (earth). The five elements can be seen to exist in the material universe at all scales of life and in both organic and inorganic things. In biological system, such as humans, elements are coded into three forces, which govern all life processes. These three forces (kapha, pitta and vata) are known as the three doshas or simply the tridosha. Each of the doshas is composed of one or two elements. Vata is composed of space and air, Pitta of fire, and kapha of water and earth. Vata dosha has the mobility and quickness of space and air; pitta dosha the metabolic qualities of fire; kapha dosha the stability and solidity of water and earth. The tridosha regulates every physiological and psychological process in the living organism. The interplay among them determines the qualities and conditions of the individual. A harmonious state of the three doshas creates balance and health; an imbalance, which might be an excess (vriddhi) or deficiency (kshaya), manifests as a sign or symptom of disease.



Traditional Chinese Medicine and Ayurveda similarities and comparison

Traditional Chinese Medicine and Ayurveda have similar theoretical teachings. In Chinese medicine it is best when the body is in a balance that is when Yin and Yang are balanced. Yin describes the cool, wet and feminine, while Yang describes the hot, dry and masculine. If the body does not maintain a balance between Yin and Yang, ailments will occur. The same is true in Ayurvedic medicine, however instead of Yin and Yang the balance is between Vata, Kapha and Pitta, the three doshas. Like in Chinese medicine, Ayurveda relies on a balance, in this case a balance between the doshas. Just as an imbalance of Yin and Yang can lead to ailment, an imbalance in one of the doshas leads to sickness as well.

Traditional Chinese Medicine (TCM) uses over 5000 plant species, while India uses about 7000 species for preparation of different medicines. But still in the international market, TCM is well established compared to Indian Ayurvedic medicine, which is in such a tenuous condition, and the way they have grown to be accepted and developed have been haphazard and informal. It is for these reasons why the Indian herbal medicines market is reputedly worth around ~US $1 billion worldwide, as against the global market for herbal medicines which is in the range of US $62 billion, with the Chinese herbal medical market said to be worth ~ US $19 billion.

A huge opportunity awaits the indigenous Indian pharmaceuticals, to be availed through innovation, patents and trademarks. India has enormous resources of medicinal and herbal plants. The pre-historic knowledge of Ayurveda and its applications to cure illnesses effectively has not been explored fully by India. If this happens successfully, India could have gained a very significant competitive edge in the global market, especially in the Pharma, beauty care and healthcare segments. There is a lot of scope for India to achieve global leadership through export of quality produce and products from medicinal and aromatic plants. But India seems to be lagging behind and is ranked third in the herbal medicine category, with less than 2% of global market share, while China occupies nearly 30% of the market.

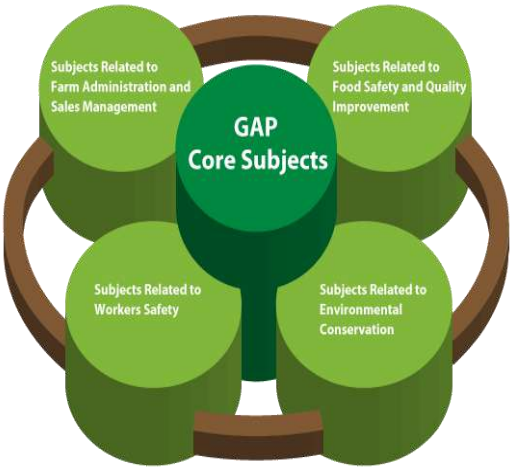
There have been a very large number of Chinese people immigrating into the USA and they support Chinese culture. There are only few Indians in America and only five colleges that provide training in Ayurveda. Globally, Chinese herbs are more preferred probably because of the research which the western countries are conducting

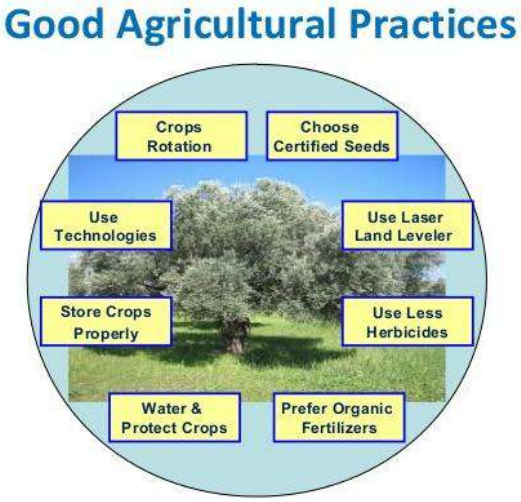
on these herbs. As in India, the medicinal herbs hardly undergo 'double blind trials' to establish their real usefulness. The scientific base for Indian herbal medicines is lacking. Indian needs to increase their educational base in the abroad to increase the awareness level of the Traditional Indian System of Medicine like Ayurveda. This is only possible when the Ayurveda will have the proven Scientific Research and Development base. Such efforts will increase the demand of the Ayurvedic Medicines and its raw materials indirectly.

1. China has proven itself on the Standards of International Regulators like US-FDA and WHO-GMP with proven empirical data of its efficacy and is willing to actively export its medical system. In China the Chinese government is fully supporting the Chinese Medicines. Under government sponsorship, China has produced translated books on the Traditional Chinese Medicines and various herbs with its mechanism of action and sending them to America. The crude herbs and finished Chinese herbal products have been imported by Chinese immigrants in the USA and made it available to anyone who want them.
2. Further, the quality of herbal materials from China has been found better than those from India in many instances (due to differences in quality control procedures). Quality control, standardization, scientific methods of production and evaluation of herbs were completely missing in India or it is not at par with the International Standards. Since in India under the Herbal cultivation we do not follow the Good Agriculture Practices (GAP). Whereas, on the other hand the China has successfully overcome such difficulties by modernizing its traditional medicine profession with government-sponsored GAPs and Good Manufacturing Practices (GMPs). GAPs stress selection of the correct germplasm with a high content of stable active components. The cultivation practices offer Standard Operating Procedures (SOPs) for use of fertilizers, irrigation systems and disease management allied with insects and pest prevention and cure. GAPs also establish standards for noxious and harmful contaminants like heavy metals, pesticide residues and microbes in plants. All manufactures of TCM are mandated to comply with guidelines laid down by China's State Drug Administration (SDA) by 2004 and farms producing raw ingredients must comply with SDA-imposed standards by 2007.

Good Agricultural Practices FAO definition

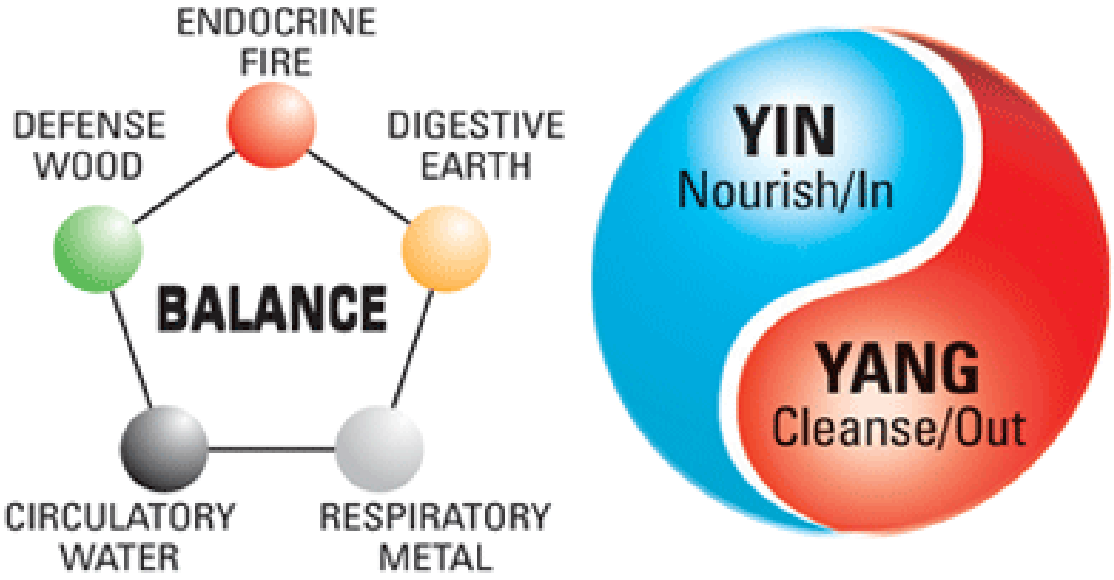
- "Good Agricultural Practices are ***environmentally sound, economically viable and socially acceptable***, and result in safe and healthy food and non-food agricultural products"

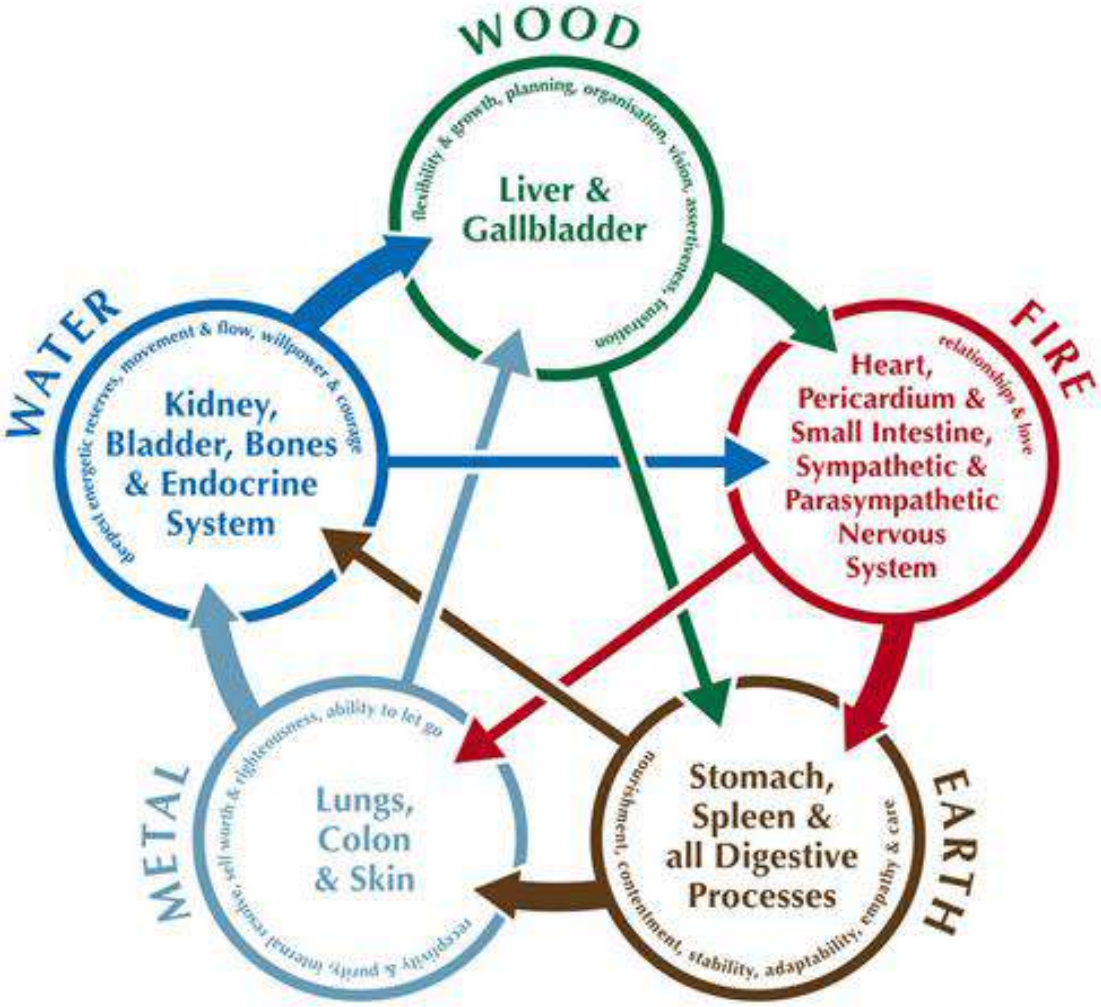




Items	Practices
1. Nursery establishment	Use of good quality seeds, healthy seedlings, soil, treatment , good management
2. Field and land Management (cultural practices)	Timely planting base on cropping calendar, irrigation
3. Integrated Pest Management (IPM)	(Physical, chemical and biological methods)
4. Crop production	Follow recommended demo protocols
5. Crop protection	Health seedlings, good quality seeds, fencing, minimal pesticide application
6. Postharvest handling practices	Maturity index, Proper harvest, sorting and grading, packaging, storage and cooling, recipe preparation, preparations for marketing
7. Records	Keeping track of what is happening on the farm

Traditional Chinese Medicinal System With Its Five Elements





3. Although Chinese medicine has gained considerable ground, it cannot be compared with the most significant import of India so far in the international arena that is *Yoga* which is a part of the Traditional Ayurvedic Medical System.

4. Nevertheless, the Indian herbal medicine market is growing at a steady pace of between 15% and 20% every year. Some Chinese herbs that were imported into India include green tea and cinnamon and some essential oils such as oil of bergamot, citronella oil, essential oils of geranium, spearmint oil, essential oil of vetiver, anise oil, cinnamon bark oil, eucalyptus oil and ginger oil.
5. Examples of successful companies, such as Himalaya Drug Company (HDC), Emami, Aswini, Ayur, Dabur, Cholayil Pharma and Patanjali that have patented their herbal and Ayurvedic products in India and abroad.

1.2 Assessment of herbal industry in India

More than 70% population is still dependant on Naturopathy for treatment as herbal drugs in India, is a highly recognizable system of medicine in the form of Ayurveda, Unani and Siddha. The folklore healers and indigenous knowledge is still the base of most of the Naturopathic Practitioners. Owing to its wide range of medicinal uses, the Indian medicinal plant extract market is expected to grow at a CAGR (Compound Annual Growth Rate) of around 22% during 2017-2022. As a result, of increased investments as well as significant demand of medicinal extract in internationals markets, there lies an immense opportunity for new and existing players to tap the fast growing market, which would garner huge revenue.

Ayurveda is the most ancient living system of healthcare. The modern quest for healthy life style has led to the fast growing acceptance of Ayurveda and herbal

products and has created a good market opportunities and conditions for the herbal sector world over. India's share in the export of herbals is 2.5% of the total global herbal market. While with the same bio-diversity and ancient culture the China has 13% share of the global herbal market. So, there is a vast scope for Indian manufacturers for entering the growing worldwide opportunities of business in herbal pharmaceutical field.

It is believed that India with its wide variety of climatic and soil conditions has ample scope in gaining a foothold in the global plant based pharmaceutical market. India has one of the world's richest medicinal plant heritages. India has 45,000 diverse plant species spread over 16 different agro climatic zones. India has a rich literature of usage of Ayurveda and herbal medicines. The system has started in our country from the Vedic period. However, in spite of rich bio-diversity and heritage of Ayurveda our country does not have much share of this multi-billion market of herbal products.

The herbal industry can be segmented into 3 categories namely medicine, cosmetic and food and beverage.

1. **Herbal Cosmetic Industry:** The herbal cosmetics industry is expected to grow annually at a rate of 12% in India. The major players of herbal cosmetic industry in India are Forest Essentials, Biotique, Himalaya Drugs, Lotus, Shahnaaz, Dabur, VLCC and many more. According to a research analysis of consumer behaviour of cosmetic industry it has been found that words such as 'natural', 'organic', 'botanical', 'free from' some harsh chemical, and even 'religious compliance', are the major factors behind the purchase of personal care products. The report says that over half of Indian consumers reported 'natural or organic' features influencing hair and skin care purchase decisions. While 71% of consumers surveyed said that they would pick up a face cream or lotion if it claimed to be 'natural', 38% said they would buy a shampoo or hair oil if it was made with 'botanical' ingredients. Even 'religious compliance' has swayed 17% consumers. Indian herbal and natural cosmetic products have a great demand in the overseas market and the products manufactured in India are supplied to international suppliers. According to CHEMEXCIL (Basic chemicals, Cosmetics and Dyes Export Promotion Council), set up by the Ministry of Commerce and Industry, Government of India is acknowledged to be the second largest exporter of herbal cosmetics to the world market after China.

2. **Food & Beverage/ Nutraceutical Market:** Nutraceuticals refer to food or part of a food, including beverages and food products that provide incremental medical or health benefits, including prevention or treatment of a disease. It spans across Functional Foods, Functional Beverages and Dietary supplements. Some instances of nutraceutical products are Probiotics, Fortified energy drinks, Vitamins and Minerals etc. The category is positioned in between Food and Beverages and Pharmaceuticals. The Indian nutraceuticals market is estimated at around $ 4 Billion in 2017 and is expected to grow at a significant 21% CAGR to $ 10 Billion in 2022. This will likely be fuelled by a significant 25% per annum growth in functional beverages market accompanied by similar potential growth from the other segments. More than 60% of this market is accounted for by dietary supplements. Few industries in India today offer such spectacular growth potential.
3. **Herbal Medicinal Market**: In 2016, the government announced that India's share in the global herbal medicinal market is only 0.5 % owing to lack of financial support and improper business planning. Pharmaceutical industries are responsible for inefficient, imperfect, informal and opportunistic marketing of medicinal plants. Herbal drug trade is secretive and unregulated. Adulteration is common in wild plants, which grow in the absence of a policy attention. The value of medicinal plants related trade in India is 5.5 billion US dollars.

Objectives of the study

The identified objectives of the project are as under:

1. To study the present cultivation and collection practices and finding necessary gaps in present scenario.
2. Mapping of soil suitability for specific variety and quality testing of the produce, (recommended by SMPB and CIMAP, Telangana).
3. Study of dependence of farmers and forest dwellers on aonla, aloe vera and ashwagandha.
4. Analysis of existing skill gap in different stakeholders and recommendation of trainings.
5. Analysis on efficiency of policies' implementation for enhancement of NTFP and for improving farmers' income in the state with respect to interest produce

6. Potential of production from underutilized and unutilized land for the produce in the state.
7. Importance of aloe vera, aonla and ashwagandha, in Telangana in terms of contribution of crops, potential area and volume, exclusive advantages, feasibility of commercial uptake.

CHAPTER 2

ASHWAGANDHA

The Crops: Following crops were selected for the purpose of study

Ashwagandha is an evergreen shrub that grows in India, the Middle East, and some parts of Africa. Its roots and orange-red fruit have been used for hundreds of years for medicinal purposes to cure various body ailments. The herb is also called Indian ginseng or winter cherry which gives boost up to body. The name **ashwagandha** describes the smell of its root (like a horse), by definition, ashwa means horse. The herb is considered one of the most important herbs in the Ayurvedic medicine system, a healthcare practice that started in India over 3,000 years ago.

Ayurvedic medicine uses herbs, special diets, and other natural practices as treatment for a variety of conditions. In Ayurvedic medicine, ashwagandha is considered a Rasayana. That means it's an herb that helps maintain youth, both mentally and physically.

Dry roots of Ashwagandha

The roots of Ashwagandha have been used to cure different kind of body ailment like arthritis, constipation, insomnia, skin conditions, stress, gastrointestinal issues, diabetes, nervous breakdowns, fevers, memory loss and many more**.** The leaves, seeds, and even fruit have all been used in different ways for various treatments. Today, Ashwagandha is sold as a supplement in the United States. It's still used to treat many of the conditions listed above. It also continues to be important in Indian medicine. Read on to learn more about the potential benefits of the herb as well as possible concerns.

How is Ashwagandha taken?

The dosage and the way Ashwagandha is used depends on the condition you're trying to treat. There isn't a standard dosage that's been studied by modern clinical trials. Ashwagandha may be used in powdered form in dosages ranging from 450 milligrams to 2 grams. You can buy it in capsules, powders, or as a liquid extract from health food or supplement stores.

What are the health benefits of taking Ashwagandha?

Modern studies have shown that Ashwagandha might be beneficial for a number of uses. But a lot is still unknown about how the herb reacts within the human body. A majority of the studies so far- while very promising- have been done on animals.

What are the side effects of taking Ashwagandha?

Ashwagandha is generally considered well-tolerated in small to medium doses. But there haven't been enough long-term studies to examine possible side effects. Pregnant women should avoid using ashwagandha because it can cause early delivery. Another potential concern for Ayurvedic herbs is that the manufacturers aren't regulated by the U.S. Food and Drug Administration (FDA). This means they aren't held to the same standards as pharmaceutical companies and food producers. One study funded by the National Center for Complementary and Integrative Health found that 21 percent of 193 products (made in both the United States and India) had levels of lead, mercury, and/or arsenic that were above what's considered acceptable for human daily intake.

2.1 Ashwagandha Market Development:

Ashwagandha is slowly pulling up in the dietary supplement market in recent times due to increase in consumer awareness and acceptance of naturopathy. Ashwagandha market segmentation is done in three ways namely form, application, distribution channel and region. By form, it is segmented as dry root, powder, and liquid extract. The use of conventional dry form has been widely accepted in certain cultures, but the availability of different dosage forms such as capsule formulation being more popular in use due to its convenience, and therefore the powdered form is expected to endure its steady growth rate. Also, factors like increasing health awareness and availability of quick information online are expected to supplement the growth of

the powder segments. By application, the *Withania somnifera* market is segmented into three main applications; dietary supplement, cosmetic and beverages. The use of dietary supplements has seen a rise in demand in developed economies such as United States where the population has a heightened trust in an herbal and botanical supplement. The use of *Withania somnifera* is gaining high popularity in regions of South East Asia. A supply driven demand has contributed to the market development where manufacturers are constantly innovating new products for various applications, cosmetic applications are one such example where the benefits of *Withania somnifera* are portrayed for growth in cosmetic industry.

By distribution channel, *Withania somnifera* market is segmented as direct sales and indirect sales. The indirect segment is further sub segmented into speciality stores, modern trade, online retail and other retail formats.

By region the *Withania somnifera* market is segmented into Asia Pacific, North America, Japan, Western Europe and the Middle East. Most traditional natural supplements such as Ayurvedic (Indian traditional medicine) are now highly accepted by the western world.

The European region with its proactive research for natural products approach has eyed this segments and successfully gained popularity, with countries such as Germany has one of the largest investment in botanicals research. The *Withania somnifera* market is also expected to growth in these regions during the forecast period.

2.2 Global Market Trends and Market Drivers

The growth of herbal healthcare market remains persistent due to its appeal as healthy and safe to use products. The sedentary lifestyle among people is creating an ever increasing demand for health and wellness promoting supplements.

Quality Roots of Ashwagandha

Withania somnifera with its natural, little to no side effect has gained attention by consumers looking for a natural weight management remedy and also for the general

tonic for brain. The high valued trust on Ayurvedic preparation in western countries has attracted the Ayurvedic manufacturers to sell their *Withania somnifera* products worldwide. The concreted faith among consumers of Ayurvedic products backed by the information available globally is expected to fuel the growth of *Withania somnifera* market. The popularity of ashwagandha has been observed by recent product launches such as "Amul Memory Milk" by Gujarat Cooperative Milk Marketing Federation (GCMMF, Indian Dairy manufacturing company) which uses Ashwagandha in its sterilized homogenized flavoured toned milk and marketed as the memory enhancer.

2.3 Important players in the market

Major market players of the global market manufacturing *Withania somnifera* include are Himalaya Global Holdings Ltd., AuNutra Industries Inc., Amax NutraSource, Inc., Carrubba Inc., Sabinsa Corporation, and Banyan Botanicals among others. The key players are focusing on developing natural products for attaining growth in *Withania somnifera* market and try to capture major market share.

The report offers a comprehensive evaluation of the market. It does so via in-depth qualitative insights, historical data, and verifiable projections about market size. The projections featured in the report have been derived using proven research methodologies and assumptions. By doing so, the research report serves as a repository of analysis and information for every facet of the market, including but not limited to regional markets, technology, types, and applications.

Cultivation Technology of Aswagandha

Local Name	:	Penneru gadda, Ashwagandha.
Botanical Name	:	*Withania somnifera* (L) Dunal
Family	:	Solanaceae

Description: It is a perennial shrub which grows abundantly in India, Pakistan, Sri Lanka, Bangladesh and parts of Northern Africa. A branched erect under shrub 0.3-1.5m high; branches terete. Leaves 5-10 by 2.5-5cm; ovate, subacute, entire, pubescent. Flowers greenish or lurid yellow usually about 5 together sessile, umbellate cyme. Berry red, smooth, 6mm. diameter, seeds 2.5mm diameter, yellow, somewhat white scurfy.

Flowering & Fruiting : May-December.

Propagation **:** By seeds.

Soil type **:** Sandy loam or light red soils.

Spacing **:** 60cm. X 60cm.

Irrigation **:** Rain-fed, 15-20 days gap in non-Rainy days.

Yield **:** 400-500 kg/ha. Of dried roots and 50 kg. to 75 kg of seeds/ha.

Therapeutic Uses:

- Powdered root given two times a day for 10-15 days to control diabetes.
- Leaves reported to possess anthelmintic and febrifuge properties.
- Roots used as liver tonic and for sexual vitality.
- For the treatment of piles, the decoction of leaves used both internally and externally.
- Roots used as a general tonic and "adaptogen" helping the body adopt to stress, especially for geriatrics to promote strength and vigour.

CHAPTER 3

ALOE-VERA

Aloe-vera is a plant species of the genus Aloe and basically grows in the tropical climatic conditions in various countries across the globe. Aloe-vera has been used for centuries and is currently more popular than ever. It is cultivated worldwide, primarily as a crop for "Aloe gel," which comes from the leaf. Aloe-vera is widely used as food derivatives**,** it is approved by the FDA as a flavouring, cosmetics, food supplements, herbal remedies.

The earliest record of a human use for Aloe-vera comes from the Ebers Papyrus (an Egyptian medical record) from the16th century BC. According to a study published in the Indian Journal of Dermatology, in ancient Egypt, they called Aloe-vera "that plant of immortality." The authors added that the plant has been used therapeutically for many centuries in China, Japan, India, Greece, Egypt, Mexico and Japan.

Benefits

The medicinal claims made about Aloe-vera, as with many herbs and plants, are endless. Some are backed by rigorous scientific studies while others are not. This article focuses mainly on those that are backed by research.

Teeth and gums

A study published in General Dentistry reported that Aloe-vera in tooth gels is as effective as toothpaste in fighting cavities. The researchers compared the germ-fighting ability of an Aloe-vera tooth gel with two popular toothpastes. They found that the gel was just as good, and in some cases even better than the commercial toothpastes at controlling cavity-causing oral bacteria.

Constipation

Germany's regulatory agency for herbs - Commission E - approved the use of Aloe-vera for the treatment of constipation. Dosages of 50-200 milligrams of Aloe

latex are commonly taken in liquid or capsule form once daily for up to 10 days. The U.S. Food and Drug Administration (FDA) ruled in 2002 that there is not enough data on the safety and efficacy of Aloe products; so, in the U.S., they cannot be sold to treat constipation.

Diabetes-induced foot ulcers

A study carried out at the Sinhgad College of Pharmacy, India, and published in the International Wound Journal looked at Aloe's ability to treat ulcers. They reported that a "gel formed with carbopol 974 p (1 percent) and Aloe-vera promotes significant wound healing and closure in diabetic rats compared with the commercial product and provides a promising product to be used in diabetes-induced foot ulcers."

Antioxidant and possible antimicrobial properties

Aloe-vera being used on skin for its antimicrobial and antioxidant properties. Aloe-vera may be used on skin conditions or superficial cuts for its antimicrobial and antioxidant properties. Researchers at the University of Las Palmas de Gran Canaria, Spain, published a study in the journal Molecules. The team set out to determine whether the methanol extract of leaf skins and flowers of Aloe-vera might have beneficial effects on human health. The scientists focused on the extract's possible antioxidant and anti-mycoplasmic activities. Mycoplasma is a type of bacteria that lack a cell wall; they are unaffected by many common antibiotics. Anti-mycoplasmic substances destroy these bacteria. They reported that both Aloe vera flower and leaf extracts had antioxidant properties, especially the leaf skin extract. The leaf skin extract also exhibited anti-mycoplasmic properties.

Protection from ultraviolet (UV) irradiation

Scientists at Kyung Hee University Global Campus, South Korea, wanted to determine whether baby Aloe shoot extract and adult Aloe shoot extract might have a protective effect on UVB-induced skin photo ageing; in other words, whether they could protect the skin from the aging effects of sunlight. Baby Aloe shoot extract (BAE) comes from 1-month old shoots while adult Aloe shoot extract (AE) comes from 4-month old shoots. In an article published in Phytotherapy Research, the authors concluded: "Our results suggest that BAE may potentially protect the skin from UVB-induced damage more than AE."

Protection from skin damage after radiation therapy

A study carried out at the University of Naples, Italy, tested five different topical creams to see how effective they might be in protecting the skin of breast cancer patients receiving radiation therapy. One of these creams contained Aloe. They divided 100 patients into five groups of 20; each was prescribed a different topical treatment. They applied the creams twice daily, starting 15 days before radiation therapy treatment, and carried on for 1 month afterward. During the 6-week period, the participants underwent weekly skin assessments. In the journal Radiation Oncology, the scientists reported that the preventive use of the topical hydrating creams reduced the incidence of skin side effects in the women treated with radiation therapy for breast cancer, none performed significantly better.

Depression, learning, and memory - an animal experiment

A study published in Nutritional Neuroscience found that Aloe-vera reduced depression and improved memory in mice. After carrying out experiments on laboratory mice, they concluded: "Aloe-vera enhances learning and memory, and also alleviates depression in mice."

Wounds from second-degree burns

A team of plastic surgeons compared Aloe-vera gel to 1 percent silver sulphadiazine cream for the treatment of second-degree burn wounds. They reported in the Journal of Pakistan Medical Association that the burn wounds among the patients treated with Aloe-vera healed significantly quicker compared with those treated with 1 percent silver sulfadiazine.

Irritable bowel syndrome (IBS)

A randomized, double-blind human trial carried out at St. George's Hospital Medical School, London, United Kingdom investigated Aloe and IBS. Their results were published in the International Journal of Clinical Practice. Participants with IBS were given either Aloe-vera or a placebo. After 3 months, there were no significant differences in symptoms of diarrhoea.

Aloe-vera market scenario

Aloe-vera is generally cultivated for food, cosmetics, beverages and medicinal industry. Aloe-vera leaves comprise phyto-chemicals under study for possible

bioactivity, such as acetylated mannans, polymannans, anthraquinone C-glycosides, anthrones, other anthraquinones such as emodin and various lectins. Aloe-vera extracts find wide application in the food, pharmaceutical and cosmetics industry. The extracts are used to formulate Aloe-vera based products such as powders, gels, capsules, drinks and concentrates. Aloe-vera is known to cure skin related ailments, cardiovascular diseases, weight loss and many more. Owing to these factors, consumption of Aloe-vera among consumers across the world has been on the rise.

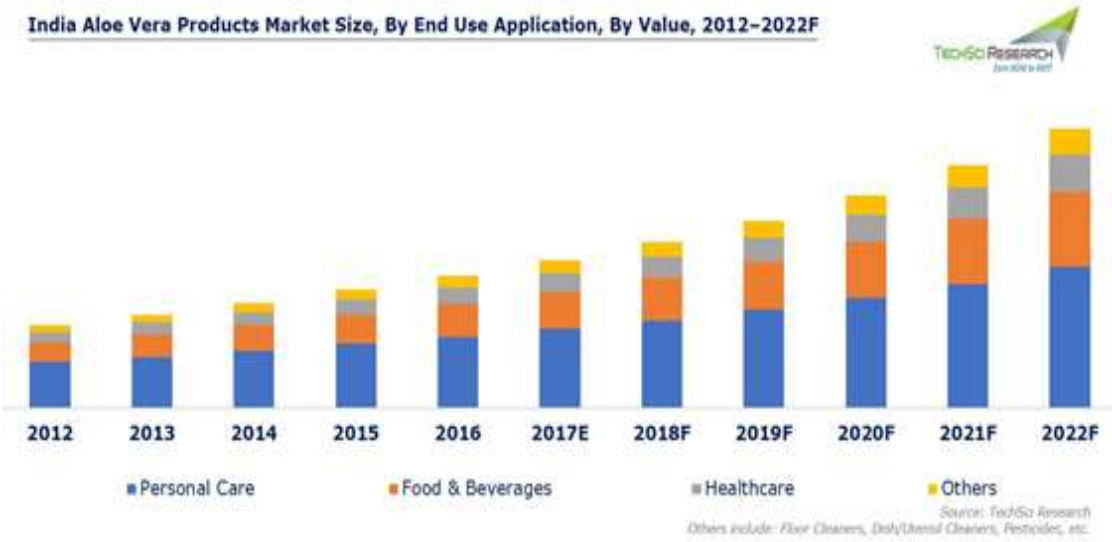
The global Aloe-vera extracts market revenue is anticipated to expand at a CAGR of over 7.7% in terms of value and 7.4%, in terms of volume during the forecast period. Factors such as increasing trend of consumers towards healthy lifestyle, coupled with increased usage of Aloe-vera extracts as an ingredient by food, pharmaceutical and cosmetics industries is fuelling market growth across the globe. Currently, the major trends witnessed in the global Aloe-vera extracts market are: usage of Aloe-vera in zero sugar drinks, as well as exploring usage of new Aloe-vera species.

The global Aloe-vera extracts market is segmented based on product type into Aloe-vera gel extracts, Aloe-vera whole leaf extracts and others. In 2015, of these segments, the Aloe-vera whole leaf extracts segment dominated the market in terms of value and volume, and it expected to remain dominant over the forecast period. Meanwhile, the Aloe-vera whole leaf segment is expected to expand at the highest CAGR in terms of value during the forecast period.

The Aloe-vera extracts market is segmented based on form into: concentrates, gels, powders, capsules and drinks. In 2015, among all these segments, the drinks segment accounted for largest value share in the global market.

Based on end use industry, the global Aloe-vera extracts market is segmented into food, pharmaceutical and cosmetics segments. Among these segments, the cosmetics segment dominated the overall market in terms of value in 2015, which is expected to expand at a CAGR of 7.7% over the forecast period. India aloe-vera products market is projected to surpass $242 million by 2022. Growth is expected to be driven by rising concerns among consumers regarding their health and skin problems, predominantly due to hectic and stressful lifestyles, which is resulting in a shift in consumer preference towards natural alternatives and herbal nutraceuticals. Moreover,

growing awareness about consuming a healthy diet that can potentially reduce occurrence of lifestyle diseases such as high blood pressure, cholesterol, obesity and diabetes, is expected to boost demand for aloe vera products in India over the next five years.



Some of the major players operating in India aloe-vera products market are Patanjali Ayurved Limited, Dabur India Ltd., Shree Baidyanath Ayurved Bhawan Private Limited. The Himalaya Drug Company, Brihans Natural Products Ltd., Aloe Veda Personal Care, Aloe-vera India, Khadi Natural, Forest Essentials, Nature's Essence Private Limited, FabIndia, MSG All Trading International Private Limited, Bright Life care Private Limited, Rattan Organic Foods Private Limited and Nourish Vitals, etc.

TechSci Research calculated the market size for India aloe-vera products using a bottom-up approach, where manufacturers' value share data for standard type of end use application (Food & Beverages, Personal Care, Healthcare, and Others) was recorded as well as forecast for the future years. TechSci Research sourced these values from industry experts and company representatives and externally validated by analysing historical sales data of respective manufacturers to arrive at the overall market size. Various secondary sources such as secondary sources directories, databases such as The International Aloe Science Council, Ministry of Ayush, Central Statistical Office of India, Ministry of Statistics & Programme Implementation, Food Safety and Standards Authority of India, National Council of Applied Economic

Research, Company Annual Reports, World Bank, industry magazines, government databases, news dailies, credible paid databases, proprietary database, white papers and investor presentations were also used by TechSci Research.

Geographical region wise spread up of Aloe-vera

Region wise distribution

Segmentation of Aloe-vera market by end use application: Food & beverages, personal care, healthcare and others.

Market, by Form: Gel Extracts, whole leaf extracts market, by Distribution Channel: Online Retail, Supermarkets/Hypermarkets, Grocery Stores/Retail stores others.

3.1 Cultivation Technology of Aloe-vera

Local Name	:	Kumari, Korphad, Gritkumari.
Botanical Name	:	Aloebarbadensis Mill
Family	:	Liliaceae

Description: The Aloe-vera plant is as old as human civilization and it has versatile properties for various purposes have been well recorded in various documents. The genus is found in tropical and South Africa, Malagasi and Arabia. The plan Aloe is introduce is other places for ornamental and medicinal purposes and it has several species under the common name of Aloe. Aloe-vera is a succulent, all most sessile perennial plant with multiple tuberous roots and many fibrous supporting roots penetrating into the soil.

Propagation: Aloe-vera is generally propagated through roots suckers called as pups. It is also cultivated by cuttings of new growths, about 15-18 cm. long suckers are planted by keeping 2/3 portion under the ground. Nearly 15000 pups are required for plantation of 1 hectare of land. Both plant to plant and row to row spacing is to be maintained 60cm X 60cm.

Soil type: It grows well on variety of soils, light, muram, loam, black, hill slopes, sea coasts, desert areas etc. it can be cultivated in driest and poorest soils but the most ideal soils for its cultivation is sandy loam that is slightly alkaline with a pH up to 8.5. However, water logged soils is not fit for its cultivation.

Irrigation: Aloe crop does not require much water, however, soon after planting the field should be irrigated. It required about 150ml of water monthly for yield of good quality leaf. The plant can be irrigated through rain-fed and sprinkler method.

Manure and Fertilizer: In India, Aloe-vera is raised as organic crop and only Farm Yard Manure (FYM) is applied (12-15 tonnes/ha). In standing crop, cow-dung is applied (5-10 tonnes/ha). Apart from FYM and natural manures with good nutritional value at the time of land preparation, it demands additional annual supplements like ammonium nitrate for optimum yield.

Harvesting/Yield: Leaving the fresh and young leaves from the top, older outer leaves are generally harvested. The plants can be removed manually or with the help of a tractor-drawn disc harrow or cultivator. New leaves grow from the centre upward. Offshoots are grown spontaneously next to the mother plant. Crop is ready to harvest after 18 months of sowing. Economic yields are obtained in 5 years after that it needs replanting. In India, the average yield for organically grown Aloe is about 12 tonnes/ha (on fresh weight basis)

Post-harvest care/Processing: Immediately after harvesting, the Aloe leaves are tipped, tailed, and its spiny ridges are removed after harvesting. For the extraction, juice is allowed to drain from the cut leaves into suitable vessels or it can simply be squeezed or grinded to get the gel. There are other sophisticated ways to separate the gel without loss of the product quality. The juice is concentrated by evaporation, either spontaneously or more frequently by boiling.

The properties of Aloe are in the concentration of all the elements that it contains and no particular extract or part of its components stands out individually in the health benefits of Aloe-vera. For this reason, Aloe gel is just the juice of the plant, cold processed with a minimum of authorized additives for its stabilization. In pharmaceutical laboratories, strict quality controls are carried out at each stage of processing in order to guarantee the condition of materials used and the final product.

CHAPTER 4

AONLA

Indian gooseberry or Aonla belongs to the Euphorbiaceae family. This fruit ripens in the autumn in wet forests and hilly areas of the Indian subcontinent and is also considered as a sacred tree in India. The fruit, with its sour taste, is very nourishing and provides with a list of amazing health benefits. Both, dried and fresh fruits can be consumed for as they provide remedies for a lot of diseases and are, thus, widely used in Ayurvedic treatments. Gooseberry is very rich in vitamin C and contains many minerals and vitamins like calcium, phosphorus, iron, carotene, and vitamin B complex. It is also a powerful antioxidant agent. Vitamin C is a good antioxidant agent, which makes gooseberries a powerful tool against a variety of conditions, including various types of cancer.

Composition of Aonla:

Moisture 81.8 g/100gm, Protein 0.50 g/100gm, Fat 0.10 g/100gm, Minerals 0.50 g/100gm Crude fibre 3.40 g/100gm, Carbohydrates 13.70 g/100gm, Energy 58 Kcal/100gm Calcium 50 mg/100gm, Phosphorus 20 mg/100gm, Iron 1.2 mg/100gm, Carotene 9 µg/100gm, Thiamine 0.03 mg/100gm, Riboflavin 0.01 mg/100gm, Niacin 0.2 mg/100gm, Vitamin C 600 mg/100gm, Choline 256 mg/100gm, Bhowmik *et al.* (2008) analyzed the mineral content of amla fruit. They reported calcium, phosphorus, magnesium, potassium, sodium, copper, zinc and manganese as 0.12 ppm, 8.70 ppm, 0.28 ppm, 6190 ppm, 180 ppm, 5.95 ppm, 38.06 ppm and 207.83. They compared the vitamin C content, total polyphenol content and the antioxidant content of the frozen fruit, dried fruit, processed fruit (ayurvedic preparation) and Merck extract (commercial preparation). Results indicated similar vitamin C content in the dried and frozen aonla fruit suggesting that tannins present in the fruit may prevent the oxidation of vitamin C during the drying process. Therapeutic potential of the fruit has been attributed to its high vitamin C content about 1 g vitamin C per 100ml of the fresh juice. A repeated

laboratory test showed that every 100 g of fresh fruit provides 470 to 680 mg of vitamin C. Vitamin C content increased when the juice was extracted from the fruit. The dehydrated berry provided 2428 to 3470 mg of vitamin C per 100g (Thakur *et al.*, 1989). Vitamin C content was also found to be high in wild variety of aonla compared to the cultivated variety **(Mishra *et al.*, 2009)**. Vitamin C present in the aonla fruit does not oxidize easily during high heat processing because of the presence of tannins. Processed fruit possesses the highest antioxidant activity. Antioxidant activity of processed and dried aonla does not depend only upon vitamin C content. Vitamin C accounts for less than 60 per cent of the antioxidant activity of the fruit. Thus the presence of emblicanins and rutin favours the conversion of dehydrovitamin C to vitamin C. Ayurvedic method of processing increases the amount of antioxidant compounds present in the final product **(Scartezzini *et al.*, 2006)**. Vitamin C and total polyphenol content in different product of aonla was reported as -

Products	**Vitamin C** (%)	**Total polyphenols**
Frozen fruit	0.40±0.0	201.8±0.8
Dried fruit	0.37±0.01	206.0±0.9
Processed fruit	1.28±0.01	255.2±1.2
Merck extract	2.00±1.3	200.1±1.3

There are some claims that the vitamin C content of aonla fruit may be an over estimation. There are questions raised about not only the quantity but also in which form the vitamin C exists **(Kapoor, 1990)**. The fruits of aonla are rich in tannins. **Ghosal *et al.* (1996) and Chaudhari (2004)** asserted that aonla fruits do not contain vitamin C either in free or in conjugated form, but contain two hydrolysable tannins of low molecular weight, namely emblicannin A and B and other tannins such as punigluconin andpedunclagin. Emblicannin A and B showed a powerful antioxidant action **Meena *et al.* (2010)**.

4.1 Health Benefit of Aonla

The health benefits of Indian Gooseberry, also known as Aonla, can be partially attributed to its high vitamin C content. Aonla helps in boosting the immune system, slowing down aging, treating throat infections, reducing blood sugar levels, and improving heart health. Aonla acts as a diuretic agent, thereby enhancing food absorption, balancing stomach acids, fortifying the liver, and nourishing the brain and

mental functioning. It also strengthens the lungs, enhances fertility, helps the urinary system, improves skin quality, and promotes healthier hair. This fruit acts as a body coolant, flushes out toxins, increases vitality, aids in vision care, and improves muscle tone.

Hair Care

Aonla powder is used in many hair tonics as it enriches hair growth and hair pigmentation. It strengthens the roots, maintains color, and improves luster. Eating fresh gooseberry or applying its paste on the roots of your hair improves hair growth and color. Aonla oil is very popular in India because it has been shown to reduce the chances of hair loss and baldness. This quality is due to the carotene content of aonla, as well as its iron and antioxidant content that prevents free radical damage to hair follicles and hormones.

Eye Care

Drinking gooseberry juice with honey is good for improving eyesight. It helps improve near-sightedness and cataracts while reducing intra-ocular tension. This is mainly due to its impressive carotene content, which has long been known for its powerful effect on vision-related conditions, including those that stem from the free radical damage. Vitamin A and carotenes in aonla also lower the risk of macular degeneration and night blindness while improving your vision.

Boosts Immunity

Due to its antibacterial and astringent attributes, Indian gooseberries protect against infection and improve the body's immune response. They are also a very good source of vitamin C, which is famous for its impressive antioxidant abilities. It increases the white blood cells in the body, which are the main line of defence for the immune system since these cells attack and eliminate foreign toxins and substances into the bloodstream throughout the body.

Aids in Calcium Absorption

One of the less discussed benefits of aonla is how it helps the body absorb calcium in a positive way. Calcium is an essential component of our bones, teeth, and nails, and also ensures that we have beautiful lustrous hair.

Improves Metabolic Activity

Eating foods that are high in protein like aonla is one of the most important ways to stay healthy since proteins are an essential part of our body's metabolic activities. Our enzymes can break down plant proteins into amino acids and reassemble them into usable proteins for our body. Protein is necessary for cellular growth, muscle development, organ health, and a wide range of metabolic activities that we need to remain healthy.

Treats Menstrual Cramps

The minerals and vitamins in aonla combine to make it very useful in the treatment of menstrual cramps. Since it takes a while for the necessary elements to accrue in the body, it is better to consume aonla on a regular basis so that its nutrients are always in the system and menstrual cramps can be prevented.

Controls Diabetes

Gooseberry contains chromium, which has a therapeutic value for diabetic patients. It stimulates the isolated group of cells that secrete the insulin. This reduces blood sugar in diabetic patients and keeps their body balanced and healthy. When blood sugar is reduced, glucose is also being used by the cells as functional energy. Thus, the metabolism is stronger and you have more energy, without the plunges and spikes in blood sugar that are dangerous for diabetics. Chromium also enhances the effect of

beta-blockers, which are used for heart health, by reducing the levels of LDL (bad) cholesterol in the body.

Acts as a Diuretic

Besides being a fruit that is very high in water content, aonla is also slightly diuretic in nature. This means that it increases the frequency and volume of urination. Urination helps our body eliminate unwanted toxins and excess levels of water, salt, and uric acid. Furthermore, it can help you lose weight since up to 4% of urine is actually composed of fat. Therefore, a diuretic substance is always necessary for keeping your kidneys healthy and for preventing urinary and uterine infections.

Helpful in Digestion

Aonla is very high in fibre, like most fruits. Fibre adds bulk to the stool and helps move food through the bowels and keeps their movements regular. This reduces the chances of constipation. Fibre can also bulk up loose stools and reduce diarrhoea. It also stimulates the secretion of gastric and digestive juices, so food is digested efficiently, nutrients are absorbed in an optimal way, and you feel lighter and healthier. Reducing constipation can also protect you from various gastrointestinal disorders, and even colorectal cancer.

Prevents Heart Diseases

Aonla powder strengthens the heart muscles, so the blood circulation is done throughout the body. By reducing excess cholesterol build-up, chromium in aonla powder can reduce the chances of atherosclerosis or plaque build-up in the vessels and arteries. This can reduce the chances of stroke and heart attack. The iron content in it promotes the creation of new red blood cells. Thereby, increasing circulation and the oxygenation of organs and cells to maximize growth and regeneration of tissues. It also keeps the blood vessels and arteries clean.

Relieves Diarrhoea & Dysentery

Due to its strong cooling and laxative properties, aonla powder is a useful component in remedies for diarrhoea and dysentery. It provides relief from the various gastric syndromes and hyperchlorhydria (burning sensation in the abdomen). As a laxative, it helps flush out toxins or harmful substances that cause discomfort or illness,

so the healing process can begin. It then cools the burning sensation and reduces the discomfort often felt during diarrhoea.

Improves Appetite

Consuming gooseberry powder with butter and honey before a meal improves appetite. Aonla powder also helps balance nitrogen levels, thereby increasing weight in a healthy way.

Acts as an Anti-aging Agent

Aonla prevents health-related hyperlipidemia by reducing the number of free radicals in the body through its antioxidant qualities. Free radicals are associated with signs of aging like wrinkles and age spots.

The fresh fruit of gooseberries contains more than 80% water, protein, minerals, carbohydrates, and fibre. It is also used as a remedy for fever, liver disorder, indigestion, anaemia, urinary problems, respiratory problems, and cerebral, gastric, and cardiovascular illnesses. Gooseberry lowers cholesterol levels, increases red blood cell production, and strengthens teeth and nails. In other words, consume Indian Gooseberry (Aonla) as a fresh fruit, juice, or in a dried powder form to see a big improvement in your health.

Aonla Extracts

Aonla extract is derived from the plant species known as *Emblica officinalis*, and falls under the category of super fruit. Aonla or Indian gooseberry is a fruit indigenous to the Indian subcontinent. Due to rise in demand for aonla extract, *Emblica officinalis* is currently grown commercially in various regions of the world. Aonla contains a high amount of salt, carbohydrates, iron, phosphorous, calcium, vitamins and amino acids. Primarily, aonla extract are available in powder and pulp forms. Extract is primarily used to manufacture cosmetic products and ayurvedic medicines for cognitive effects, as anti-oxidants, in ulcer and diabetes prevention and offers anti-inflammatory benefits as well. In addition, it is also used to manufacture various beauty products and health foods. Aonla is particularly effective for hair care, such as to prevent hair loss and to enhance texture.

The market can be segmented on the basis of medicinal use to cure various diseases. The segmentation can also be done on the basis of application in the medicinal field as aonla extract are used for heart health, diabetes, radiation protection, skin and collagen, blood vessel health and others. The growing recognition of alternate medicines, health foods and herbal products has significantly fuelled the demand for aonla. On the basis of geography, the market has been segmented into Western Europe, Asia, Oceania, North America, Latin America and Rest of the World (RoW). RoW consists of the Middle East, South Africa and other small-yet important regions. The market can also be broadly augmented on the basis of end-user industry as food & beverages, pharmaceuticals, nutraceuticals, cosmetics and personal care and others.

The aonla extract market is poised to grow at a healthy CAGR due to the various ongoing research and development initiatives. During a recent study conducted by Taiyo Kagaku Company and Mile University Graduate School of Medicine in Japan, scientists discovered that aonla could be a high anti-inflammatory, anti-coagulant and anti-platelet agent, useful in treating a range of vascular disorders.

Aonla extract (ingredients) are useful in various food & beverage applications such as nutritional bars, cereals, jams, powder drink mixes, yogurts and dietary supplements. The potential for aonla extract as a food ingredient is increasing substantially, owing to the growing global nutraceuticals and functional food market. Aonla extract also provides broad spectrum skin protection against heavy metals due to its anti-oxidant properties. Thus, the market for aonla extract is expected to grow at a healthy CAGR throughout the forecast period.

Some patents regarding aonla extract have been sanctioned to E. Excel International, USA and Natreon, Inc., USA by the United States Patent and Trademark Office. The former filed patent for the use of aonla extract in freeze-dried ginseng berry tea (acquired in 2001) and later filed patent for use of aonla in cosmetics, nutritional and pharmaceutical formulas (acquired in August 2000).

India exports a significant amount of aonla and aonla extracts to countries like the U.S., Japan, Nepal, Bangladesh, Malaysia, Germany and the Netherlands, among others. Various herbal medicine manufacturing companies are formulating aonla

extracts to provide novel dietary supplements in herbal tea and powders forms. Effective production, processing and marketing of aonla extracts is expected to boost the market size during the forecast period. Biomax, Taiyo international (SunAmla), Arjuna Natural Extracts Ltd., Nutra Genesis and Archerchem are some key players in the aonla extract market.

4.2 Aonla Market Landscape

Global Aonla market is segmented on the following bases:

By Form **:** Pulp, Powder (Contribute more than 50%), Liquid

By Distribution **:** Health stores, drug stores, online retailing and other similar distribution channels

By Application **:** Diabetes, Skin and Collagen, Heart Health, Blood Vessel Health, Cosmetics, Dietary supplement, Pharmaceuticals, Food & Beverages.

By End-Use **:** Pharmaceuticals, Personal care and Cosmetics, Food and Beverages, Nutraceuticals

By Geography **:** North America, U.S., Canada, Europe, U.K., France, Germany, Italy, Russia, Rest of Europe, Asia Pacific, Japan, China, India and Australia.

Key Players Identified across the value chain in the aonla extracts market includes but is not limited to:

On analysing the demand prospects it was found that pharmaceuticals, cosmetics, and food & beverage industry acquire majority share in terms of volume. In food and beverage industry it is used as an anti-oxidant agent in different food products. Geographically, the global hubs of Aonla include North America, Latin America, Europe, Asia Pacific, Middle East and Africa. Globally, Asia has emerged as the most dominant market for Aonla.

The major reason for increase in demand is in escalation of naturopathy and natural ingredients in food and cosmetic sectors worldwide. On the other side, the powdered form of Aonla has outran the liquid form far behind and trending in the market because of its wide applications.

Some of the key players identified across the value chain of the global E*mblica officinalis* market include the Green Labs LLC, Nutra Green Biotechnology Company Private Limited, Nexira, Indena S.P.A, Xi'an Pincredit Bio-Tech Company. Mountain Rose Herbs, Dabur India Limited, Himalaya, Patanjali, Zandu and Vaidhyanath and others. The companies are expected to expand their business by enhancing their product portfolio in global *Emblica officinalis* market. The companies are projected to frame certain strategies in future in order to gain the competitive advantage in global *Emblica officinalis* market till 2025.

4.3 Cultivation Technology of Aonla

Local Name	:	Aonla, Amla, Amalkhi, Usiri
Botanical Name	:	Emblica officinalis
Family	:	Phyllanthaceae

Description: Plant is native of tropical South Eastern part of India. Aonla plant is also growing well in Sri Lanka, African countries and many parts of South and Latin America. The tree is a deciduous, small and middle sized, with a crooked trunk and spreading branches. Leaves sub sessile 10-13 by 2.5-8mm closely set along the branchlets, distichous, light green, glabrous, narrowly linear obtuse. Flowers greenish yellow in axillary, fascicles on the leaf-bearing branchlets. Fruit 1.3-1.6cm, fleshy, glabrous and pale yellow. Seeds trigonous. The tree flowers from March to May and fruits ripen from November to February.

Propagation: The plant can be propagated by seeds as well as vegetative methods

Soil type: Plant grows well in sandy loam-clay soils.

Spacing: Grafted or budded plants or layered should be planted at a distance of 5-8mts.

Irrigation: A well-distributed rainfall is required for proper flowering and fruiting. Plantation should be irrigated once in a week in summer months

Yield: A mature tree of about 10 years will yield 50-70 kg. fruits. Weight of each fruit is 20-70 grams.

Therapeutic Uses:

- Fruits are rich source of vitamin C.
- The fruits of Aonla are one of the three constituents of the well-known Indian preparation "Triphala Churnam" the other two being Terminalia bellirica Roxb. (Tani) and Terminalia chebula Retz (Karakai). Triphala is used as a laxative and in the treatment of enlarged liver, piles and stomach complaints.
- Leaf juice is applied on wounds twice a day for 3-4 days to treat fresh wounds.
- Powdered fruit mixed with honey is given orally twice a day for one month to treat sinusitis.
- Aonla fruits are good liver tonic. Raw fruits are cooling and mild laxative.
- Herbal tea can be used to ameliorate diabetic neuropathy.
- "Chavanprash" is another commonly used preparation from Aonla fruits, which is used for growth, vigour and general health.

CHAPTER 5

FIELD EXPERIENCE AND LOCAL MARKET EXPERIENCE FOR ASHWAGANDHA ALOE-VERA AND AONLA

Important local market players are Bhaskara Bio-tech Pharma Company, Arogya Rama Genetics, Biomax, Youngever and Mediherbz. These companies are based at Hyderabad and providing the local support to the farmers because they are buying the raw material of various medicinal crops including Ashwagandha, Aloe-vera and Aonla directly from the farmers. Some time they are buying the raw material with the help of mediators / middleman at a very cheaper rate. As these are small and medium companies so they are buying small quantities of raw material from the farmers ranging from 1 to 3 tonnes annually. The demand of raw material is depend on the forward linkages of the company and it is keep changing year by year. In the Telangana a local value chain persist in the area where the crop is being grown.

Generally, farmers are getting Rs. 130-150 per Kg for dry Ashwagandha roots to the middleman. The middleman sold the same raw material to the wholesaler by adding 20-30% profit margin and the same material goes to the pharmaceutical companies working in Hyderabad. These companies are in manufacturing of various herbal products like Ashwagandha powder, tonic, power-pills, syrup and lapnum. The price of these manufactured product is quite high sometimes it may be Rs. 500-600 per sachet or even more. So it is observed during the visit of these companies that they are earning multiple times and the benefit is not being transferred to the farmer.

During the visit in the field area it has been found that a Suguna Chicken Company and Womcub Chicken Company are adding Ashwagandha powder and *Andographis peniculata* powders in the chicken feed so that more healthy egg and chicken can be obtained. The local value chain of Ashwagandha, Aloe-vera and Aonla is given below:

Table 1: Local value chain of Ashwagandha, Aloe-vera and Aonla

S. No.	Name of crop	Price realised by farmers (Rs. Per Kg)	Price realised by middleman (Rs. Per Kg)	Price realised by wholesaler (Rs. Per Kg)	Product made by the company	Local Market Linkage
1	Ashwagandha	130-150	200-230	230-250	Ashwagandha powder, tonic, power-pills, syrup and lapnum	Begum Bazar, Hyderabad, Bhaskara Bio-tech Pharma Company, Arogya Rama, Bio-Max, Youngever, Mediherbz and TSGCC
2	Aloe-vera	5-6	10-12	14-18	Soap, gel, syrup, face cream, shampoo, pharmaceutical product	
3	Aonla	70-100	100-150	160-170	Triphala churan, Aonla candy, murabba, pickle, chutney	

The price realised by the companies of the products are quite high and depends on the quality of products like Ashwagandha powder, tonic, power-pills, syrup and lapnum, soap, gel, syrup, face cream, shampoo, pharmaceutical product, Triphala churan, Aonla candy, murabba, pickle and chutney. The margin of the products are sometime more than 300-500% because of value addition and processing of product by the companies. Price realised by some major companies working in Telangana and other states manufacturing different kind of herbal products is more than 300-500%. The prevailing market rates of some herbal products manufactured by herbal companies are as under:

Table 2: Prevailing market rates of some herbal products

S. No.	Crop / Raw Material	Farmer (Rs./kg)	Collector (Rs./kg)	Trader (Rs./kg)	Manufacturer		Name of Product
					Volume	Price (Rs.)	
1	Aloe-vera,	5-6	10-12	14-18	250 ml	250	Ale-vera Juice
2	Aonla	70-100	100-150	160-170	500 ml	350	Aloe-vera Stevia juice
3	Ashwagandha	130-150	200-230	230-250	500 ml	250	Aloe Aonla juice
4	Aonla	70-100	100-150	160-170	500 ml	250	Aonla juice
5	Aonla	70-100	100-150	160-170	100 ml	250	Oshadhi hair oil
6	Aonla	70-100	100-150	160-170	100 ml	120	Bhringaraj hair oil
7	Aloe-vera	5-6	10-12	14-18	100 ml	120	Aloe-vera hair oil
8	Aonla	70-100	100-150	160-170	100 ml	120	Aonla hair oil
9	Aonla	70-100	100-150	160-170	100 ml	120	Hibiscus hair oil
10	Aonla	70-100	100-150	160-170	100 ml	50	Saraswathi (Brahmi) Thailam
11	Ashwagandha	130-150	200-230	230-250	50 ml	100	Herbal pain oil
12	Aloe-vera	5-6	10-12	14-18	50 ml	110	Aloe-vera skin care oil
13	Aloe-vera	5-6	10-12	14-18	10 ml	50	Kumkumadi Thailam
14	Aloe-vera	5-6	10-12	14-18	75 gram	100	Aloe-vera gel
15	Aloe-vera	5-6	10-12	14-18	75 gram	100	Aloe papaya gel
16	Aloe-vera	5-6	10-12	14-18	75 gram	100	Aloe saffron gel
17	Aloe-vera	5-6	10-12	14-18	75 gram	80	Aloe menthol gel
18	Aloe-vera	5-6	10-12	14-18	75 gram	80	Aloe jasmine hair gel

S. No.	Crop / Raw Material	Farmer (Rs./kg)	Collector (Rs./kg)	Trader (Rs./kg)	Manufacturer		Name of Product
					Volume	Price (Rs.)	
19	Aloe-vera	5-6	10-12	14-18	100 gram	40	Aloe-vera beauty soap (Saffron)
20	Aloe-vera	5-6	10-12	14-18	100 gram	40	Aloe-vera beauty soap (Jasmine)
21	Aloe-vera	5-6	10-12	14-18	100 gram	40	Aloe-vera beauty soap (Rose)
22	Aloe-vera	5-6	10-12	14-18	90 gram	75	Aloe-vera beauty soap (Sandal)
23	Aloe-vera	5-6	10-12	14-18	90 gram	30	Tulasi soap
24	Aloe-vera	5-6	10-12	14-18	125 ml	140	Aloe-vera shampoo
25	Aonla	70-100	100-150	160-170	125 ml	140	Ritha Shampoo
26	Aonla	70-100	100-150	160-170	125 ml	140	Herbal shampoo sachet
27	Aloe-vera, Aonla, Ashwagandha	As Above	As Above	As Above	90 capsules	120	Triphala Capsules

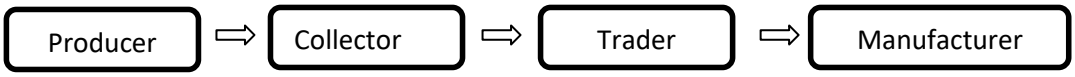
5.1 Experience from Market

This study is taken up to identify the existing/ functioning marketing channels involved in the marketing of the medical crops such as Aloe-vera, Aonla, Ashwagandha through which the end products flow to the ultimate consumers in the selected study area. In addition to that, also made an attempt to understand the marketing margin earned at the each stakeholder in the marketing structure which added to the end product and final calculated the price spread of the selected commodities.

5.2 Marketing Channel

The analysis of the collected data reveals that, there is only one principal channel or route through which medicinal plants marketed from the producer (farmer)

to the manufacturer. The major channel of distribution of medicinal plants observed was as follows:



Important observation made from the field visit is that, for medicinal plants marketing, decentralized marketing channel is in effect in the selected study area where the middle men or wholesale purchasers purchase directly from the farmers in absence of physical market.

In case of medicinal plants marketing, farmers sell the produce to the collector from them the traders and manufactures purchase. In this channel final consumers were not traced out as these raw produce extracted from the selected medicinal plants is not used directly by the consumers and these raw material undergo value addition in various forms for production of other value added commercial products such as production of Ale-vera Juice, Aloe-vera hair oil, Aloe-vera skin care oil, Kumkumadi Thailam Aloe-vera gel,Aloe papaya gel Aloe saffron gel,Aloe menthol gel Aloe-vera beauty soap, Tulasi soap, Aloe- Triphala Capsules, Aloe vera shampoo, Aonla and Ashwagandha hair oils, gels, and shampoos in combination of sandal, rose and hibiscus. Price realised at various stakeholders' level in the marketing channel (Rs. /kg)

Table 3: Price realised by various stakeholders' level in the marketing channel (Rs. /kg)

Crop	Producer	Collector	Traders	Manufacturers
Aloe vera	5-6	10-12	14-19	300-5000
Aonla	70-100	100-150	160-170	500-2500
Ashwagandha	130-150	200-230	230-250	500-2000

Aloe vera raw material price at producer's level is in the range of 5-6 per kg. The same material collectors are selling in the range of Rs. 10-12 per kg and traders selling at Rs. 14-19 per kg. After value addition at the manufactures level the different end products realising prices in the range of Rs. 300-5000 per one kg of Aloe Vera. Medicinal crop Aonla farmers are realising 70-100 per Kg raw material, collectors-Rs. 100-150 and traders-Rs.160-170 per kg whereas manufactures realising around Rs. 500-2500 per kg/lit after value addition. Even Ashwagandha also in the same line.

5.3 Market margin and Price Spread

Marketing margin assists in understanding the difference between the price paid by the consumer and that obtained by the producer at the Farm gate. It is also shows the difference in price of a commodity at different stages of the marketing system. Whereas commodity-price spread explains the difference between consumer and producer prices. The spread includes the marketing cost incurred by the intermediaries as well as their margin. Price spread analysis not only shows the marketing costs and marketing margins at different levels of marketing by different marketing agencies or channels but also show a clear picture of the entire system of marketing.

$$\text{Price Spread} = \frac{(\text{Manufacture price} - \text{Net price of producer})}{\text{Manufacture price}} \text{ X } 100$$

Table 4: Aloe-vera marketing margin (Rs.) for different end products

Product	Producer price	Manufacturer price	Market margin (in Rs.)	Price spread (in %)
Aloe Vera Juice	6	1000	995	99.5
Gel products	6	1196	1190	99.5
Shampoos	6	1120	1117	99.5
Soaps	6	473	467	98.7
Hair oil	6	1200	1194	99.6

Product	Producer price	Manufacturer price	Market margin (in Rs.)	Price spread (in %)
Aonla Juice	85	700	615	82.9
Shampoos	85	1120	1035	91.1
Hair oil	85	1525	1440	92.8

Product	Producer price	Manufacturer price	Market margin (in Rs.)	Price spread (in %)
Ashwagandha Juice	150	500	350	80.0
Hair oil	150	2000	1850	95.0

The experience shared by Sh. Kasarala Jayachandran Reddy, Farmer from village Kanchanpally, Mandal Nalgonda, he informed that Aonla is cultivated in Medak, Rangareddy, Mehaboob Nagar and Nalgonda District of Telangana.

The area of about 4000 acre old plantation is spread over in these districts, however, 300 acre area of new plantation of Aonla was done during last year. It has been observed during the interaction with the farmers that market is a big problem faced by the farmers since last 3-4 years. BioMax, Hyderabad based company is only the purchaser of Aonla from the farmers and also purchase from the local mandies. Various small companies based at Hyderabad also purchased Aonla from the local weekly market.

The intercropping was done by the farmer in Aonla plantation by planting white sandal wood trees in the field and red sandal wood trees near the boundary of the field. Sh. Jayachandran Reddy is growing NA-7, NA-10, Kanchan (NA-4) and Krishana (NA-5) varieties of Aonla in the field. However, a local variety BSR-1 is also available but not advisable due to small size of fruits. As informed by the farmer the market is available for Aonla in the district of Srikakulam, Vijayanagaram, Vishakhapatnam, Khammam, Guntur and Prakasam districts of Telangana. However, farmers are also selling Aonla fruits in the local market of Nalgonda. Basically, it is a fruits and vegetable market but the buyers of Aonla also arrived to buy Aonla from this market. The rate of Aonla fruits was given to the farmers is Rs. 30/-kg.


Fruinting of Aonla

The local value chain of Aonla persist in the area which is look like – farmer (Rs. 20-30 per kg), middleman (Rs. 30-40 per kg), Big retailer (Rs. 40-50 per kg) and sometime Aonla is sold @ Rs. 1 per piece after dipping in the solution of salt. Sweet Candies also prepared by some local people and sold out on the local shop because it is very favourite to the children. It is also informed by the farmer that the Aonla in the Telangana is also transported to the nearby state like Odisha and Jharkhand. The Aonla fruit is dipped for a week in a home-made solution of Salt, Turmeric, Chilly, and water solution after giving some cuts in the Kali of Aonla. In doing so, the self-life of Aonla is increased from 6 month to 1 year and used by the local people as a pickle during the meal time. It is being sold by the local shopkeeper @ Rs. 1-2 per piece.

It is noticed during the discussion that a very nominal cost of Rs. 3000 per acre is required for plantation of Aonla and it starts fruiting after 3-4 years. As informed by the farmer, he is getting Rs. 50000/- per acre profit from 1st harvest and Rs. 30000/- per acre from the 2nd harvest of Aonla. It means farmers are getting Rs. 80000/- net return in a year from one acre piece of land. Generally two harvests are being taken by the farmers in a year. He said that there is no problem of marketing of Aonla in our region because buyers from nearby states as well as from Telangana came frequently to purchase fresh Aonla.

A case of Sh. Janardan Reddy from Rangareddy District of Telangana depict that Aloe-vera is being cultivated in Rangareddy, Medak, Nulgonda and Mehaboob Nagar district of Telangana. The initiative for extension of Aloe-vera crop in these districts was taken by Sh. Janardan Reddy with the support of Telangana State Medicinal & Aromatic Plant Board, Hyderabad. The initiatives was well taken by the farmers and in a sort period the crop has been extended in the area of 1100 acre with a buy back arrangement with Patanjali, Hardwar. As stated by the farmers 35-40 tones fresh leaves can be obtained from one acre of land if all good conditions prevails.

The buy-back arrangement for fresh pulp @ Rs. 21/- per kg was exercised between the group of farmers and M/s Patanjali Ayurved Ltd. Hardwar. As stated by the farmers, an agreement was done between both the parties with a condition that both will save the interest of each other. The 11 month duration crop, as observed during the field visit, was ready for harvest. However, no one could turned up from M/s Patanjali Ayurved Ltd. Hardwar to make an arrangement of purchase of Aloe-vera crop as per agreement.

It was also observed that farmers were in a great trouble that a company like M/s Patanjali Ayurved Ltd. Hardwar is not come forward to purchase the crop of Aloe-vera ready for harvest. At this stage it is very pertinent to advise to the government to have an agreement between small companies working in the Telangana state so that this kind of situation could not prevailed. Sh. Janardan Reddy is a progressive farmer and a strong political leader, in spite of that the condition of marketing is beyond his reach. Here government handholding is required to safe guard the interest of farmer otherwise the crop will finish quickly from the area.

There are some agencies working locally and manufacturing products from Aloe-vera like Juice, medicines, soap, cream, shampoo, face pack and body lotions. These companies are based at Hyderabad and having a branch office in other districts

also, they may be contacted for market arrangement of Aloe-vera enabling farmers to sale their produce at local end point.


Field View of Aloe-vera at Village Kothularam, Nalgonda

Aloe-vera is a perishable crop it needs quick arrangement of marketing. However, it was opined by the farmers that if a dry powder making unit is installed at district level for making powers from Aloe-vera leaves, it will increase the self-life of Aloe-vera for more than 30 days. The cost for installation of powder making unit is around Rs. 15 crore, hence, the unit should be installed with the financial support from the State/Central Government enabling farmers to get higher price of their produce. The installation of dry powder making unit is beyond is reach of small firms and industries working in that areas as the financial investment is quite high.

It was also observed from the field that farmers are growing local varieties of Aloe-vera intercropping with local varieties of pulses called as Uluvacharu which is used for making sambhar a local dish. There is no fat and sugar in the local varieties of pulses, it is opined by the farmer Sh. Buchuramulu, Village Kothularam, Mumugondu Mandal District Nulgonda. He has 5 acres of land having the drip irrigation facility and showing Aloe-vera and other crops at the farm land and he has also opined that there is no need to change the variety of Aloe-vera as variety available is performing well.

5.4 Local Market Experience

The local market of Ashwagandha, Aloe-vera and Aonla is available in and around Hyderabad those are hand holding with the farmers and support in procuring the raw material direct from the farmers. Important local market players are Bhaskara Bio-tech Pharma Company, Arogya Rama Genetics, Biomax, Youngever and Mediherbz. These companies are based at Hyderabad and providing the local support to the farmers because they are buying the raw material of various medicinal crops including Ashwagandha, Aloe-vera and Aonla directly from the farmers. Some time they are buying the raw material with the help of mediators / middleman at a very cheaper rate.

As these are small and medium companies so they are buying small quantities of raw material from the farmers ranging from 1 to 3 tonnes annually. The demand of raw material is depend on the forward linkages of the company and it is keep changing year by year. In the Telangana a local value chain persist in the area where the crop is being grown.

Table 5: Local Value Chain

S. No.	Name of Company	Raw Material Procured	Annual Demand	Product Profile
1	Bhaskara Bio-tech Pharma Company	Ashwagandha, Aloe-vera and Aonla and other medicinal crops	2-3 tone	Aloe-detox, Aloe-Noni, Aloe-vera Face wash and body lotion, hand-made cream, shampoo, hand wash, multipurpose gel etc.
2	Arogya Rama	Ashwagandha, Aloe-vera and Aonla and other medicinal crops	3 tone	Herbal Powder, soap, face cream, Juice, Cosmetics, Shampoos, Neem powder, Tulsi ark, Arjun churn etc.
3	Genetics	Ashwagandha, Aloe-vera and Aonla and other medicinal crops	2 tone	Aloe-vera juices, oils, gels and creams, handmade soap, bath powder, shampoos, soap, powder, honey herbal pack, hair pack.
4	Bio-Max	Ashwagandha, Aloe-vera and Aonla and other medicinal crops	2 tone	Aonla Juice, Powder, Triphala, Candy, Chutney etc.
5	Youngever	Ashwagandha, Aloe-vera and Aonla and other medicinal crops	3 tone	Juices, oils, gels and creams, handmade soap, bath powder, tooth powder, shampoos, soap, powder, honey herbal pack, hair pack, hair treatment kit and tablets and capsules.
6	Mediherbz	Ashwagandha, Aloe-vera and Aonla and other medicinal crops	1.5 tone	Shampoos, Face Pack, Cream, Hair Oil, Massage Oil, Powder, Lotion, Gel, Face Scrub, Pain reliving Oil, Herbal Mehndi, Anti pimple cream, fair glow, soap, skin care oil, face wash etc.

5.5 Bhaskara Bio-tech Pharma Company

Photo – Courtesy by Bhaskara Biotech, Hyderabad

Bhaskara Bio-Tech is in manufacture and sale of highest quality aloe-vera products. These are aloe vera based health, beauty and personal care products and main aim of the company is to spread better health and beauty by using aloe-vera products. Company is also engaged in growing and manufacturing of aloe-vera crops as well as products development and have a complete range of aloe-vera products.

Bhaskara Bio-Tech is a proprietary manufacturing unit having the drug license for manufacturing of aloe Vera products from the department of Ayush Government of Andhra Pradesh. Bhaskara Bio-Tech is in manufacture and sale of highest quality aloe Vera products and produce aloe vera based health, beauty and personal care products. Bhaskara Bio-Tech products have been designed specifically to treat the growing problems of today's world like obesity, indigestion, diabetics, joint pains, skin problems and so on. They are manufactured at very high standards by us. Annual demand of the company is around 2-3 tonnes of raw material of different medicinal crops. Generally procurement is done from the farmers as well as from the wholesaler from Beghum Bazar, Hyderabad.

5.6 Arogya Rama SHG Group

Photo - Courtesy by Arogya Rama, SHG Group

Arogya Rama is a Self Help Group of Farmers working in Medchal and Rangareddy District of Telangana under the leadership of Sh. Rameshwar Reddy. Arround 50 farmers group are working under one umbrella and each group having 20-25 farmers in a group. The raw materials of different medicinal crops like Ashwagandha, Aloe-vera, Aonla, Safed Musali, Tulsi and Guduchi are being procured by Arogya Rama directly from the farmers and there is no intermediaries in the value chain.

The present value chain is giving the opportunity to the farmers for direct sale and they are getting 15-20% value of their crop in comparison to the rates prevailing in the market. The annual turn-over of the SHG group is Rs. 2 crore per year. The farmers are flourishing with this kind of system and ready to sale their crop happily to the SHG members. Sh. Rameshwar Reddy, the group leader opined that Arogya Rama is trying to expend the business in other district also because various farmers of nearby district approaching us. The Arogya Rama SHG is manufacturing various herbal powders, soap, face cream, juice, cosmetics and shampoos. All product made by SHG groups.

5.7 Bio-Max

Company is a leading innovator and manufacturer of nutraceuticals, standardized herbal extracts, spice oleoresins, natural colours, fruit & vegetable powders used for dietary supplements, pharmaceuticals, cosmetics, etc. promoters of BioMax have a strong pharmaceutical manufacturing experience and successfully promoted Matrix Laboratories and BioMax Fuels. A vertically integrated company, BioMax is involved from farming to production and formulation. BioMax has set-up a world class manufacturing facility located at Alexandria Park (Formerly known as SP Biotech Park), Genome Valley, Hyderabad adhering to GMP standards employing automated manufacturing operations minimizing human handling.

BioMax is backed-up by a strong technical team who strive continuously for innovation and developing cutting edge process technologies to ensure product consistency in terms of quality, supply and adhering to all the standard parameters.

5.8 Young-ever

Product of Youngever Nature Solution

Youngever Nature Solutions Pvt. Ltd. is registered as Farmwealth Biotech in India an Established Farming Company having decade of Experience in the field of Nursery and Cultivation of Medicinal and Aromatic Plants. The company is diversified into Manufacturing of Herbal & Ayurvedic Products having brand name of YOUNGEVER (Nature Solutions). Since inception, company have been striving to set new standards of excellence by providing quality products to meet the requirements of clients and as per industry standards. The

company is manufacturing different kind of health product segment like juices, oils, gels and creams, handmade soap, bath powder, tooth powder, shampoos, soap, powder, honey herbal pack, hair pack, hair treatment kit and tablets and capsules.

5.9 Mediherbz

Mediherbz is a registered company and a cottage industry established in 2008 and working in Hyderabad. The company has full flagged manufacturing process of various kind of herbal products like skin care product, body care, bathing scrubs, face pack, shampoo, herbal mehndi, rose water, herbal hair oil, triphala churn, all purpose cream, joint pain ointment, pimple care packs, soap, pigmentation marks cream etc.

Product Range of Medihearbz

Interview with Owner

Manufacturing Equipment

Manufacturing Equipment

The company is run by a women entrepreneur Smt. Jhanshi Laxmi Bai. Company is purchasing raw material from various districts/states like mehndi and multani mitti from Rajasthan, Leaves and roots of Tulsi, Aloe-vera, Aonla, Neem, Hibiscus flower from wholesale store of Begum Bazar, Hyderabad, as informed by the owner. Mediherbz also procured raw material from self-help group working in this area. The company is a GMP certified company producing different kind of herbal products. Company is selling product through organic store, homeo store, Ayurvedic store, Amazon and also promoting the self-help group.

5.10 Initiatives taken by Girijan Cooperative Corporation Ltd. at Telangana

Telangana State Girijan Cooperative Corporation Ltd is working under the Tribal Welfare Department, Govt. of Telangana in different areas like procurement of minor forest produce, seasonal agriculture produce, distribution of agricultural commodities to the tribal people, supply of food provisions and cosmetic items, value addition and retail marketing and agricultural credit support. The agency was established in 1956 for the socio economic benefit and as a developmental agency for tribal people.

Interview of Dy. General Manager (Mktg.), TSGCC Ltd.

The agency was appointed was a Government Agent to conferred monopoly rights through Minor Forest Produce (Regulation of Trade) Regulation (1) of 1979. The agency is spread its wing in all Telangana State and it has the Head Office in Hyderabad including three Divisional Office 18 Society Offices and 365 Depots in the State of Telangana. Agency is procuring minor forest produce and Essential Agricultural Produce from the tribal people by ensuring remunerative prices and eliminating middle man from the value chain of Minor Forest Produce. Various products are being procured by the agency like rock be honey, gumkaraya, Nuxvomica, Mahuwa Flower, Mahuwa seed, Pumgum Seed, Soap Nuts, Tamarind, Soya Beans, Paddy, Aswagandha and Aonla directly from the tribal people. In the marketing chain of the agency, there is no middle man in the value chain. Due to that tribal people are getting higher price value of their produce in comparison to the value chain prevailing with the middle man. In doing so maximum benefit is being transferred to the farmers/tribal peoples.

The agency is also met out the requirement of food items of tribal people through a network setup by the agency in the name of daily requirement depot and also supplied cosmetic items to the Tribal Educational Institution. The agency has three divisions in Bhadrachalam, Eturnagaram and Utnoor as an Institutional arrangements.

- Purchasing Minor Forest Produce (MFP) and Agricultural Produce (AP) from them at reasonable and fair prices. 24 items notified as MFP are permitted for procurement.
- Supplying Essential Commodities (ECs) and other Daily Requirements (DRs) at a fair price through a network of 838 Fair Price Shops otherwise called as Daily Requirement (DR) depots.
- Meeting their Credit requirements in an easy, convenient and effective manner
- Imparting training to the tribal in collecting the Minor Forest Produce so that yields can be increased without endangering the trees and environment.
- Collecting the Minor Forest Produce at the very doorstep of the tribal

- Guarding against deterioration and degradation of their produce
- Researching to find better gradation and storage techniques
- Pro-active search for adding new Minor Forest Produce to the list.
  - Value Added Product of TSGCC
  - Aloe-vera soap
  - Orange soap
  - Papayya soap
  - Neem soap
  - Honey soap
  - Detergent soap
  - Aloe-vera Shampoo
  - Chilli Powder
  - Turmeric Powder

All products are being manufactured in the brand name of Giri. The agency is procured raw materials not only Aloe-vera, Aswagandha and Aonla but also other commodities of Minor Forest Produce and hand holding the tribal peoples. Agency is also providing marketing support to the tribal people and procured the raw material with the depot established in the remote areas. It is a good marketing venture established by the Govt. of Telangana and ready to support tribal peoples as well as farmers. The agency is planning to expend its business through processing of different commodities as under:

- Nutri food processing unit at Bhadrachalam, Eturnagaram, Utnoor and Mannanur
- Dal processing unit at Bhadrachalam and Utnoor
- Chilli / Turmeric processing unit at Eturnagaram and Mannanur
- Soap making unit at Bhadrachalam, Utnoor and Mannanur
- Sanitary napkin making unit at Bhadrachalam, Eturnagaram and Utnoor
- Jute bag making unit at Bhadrachalam
- Tailoring unit at Bhadrachalam, Eturnagaram, Utnoor and Mannanur
- Cashew processing unit at Bhadrachalam

5.11 Local Market of Medicinal Herbs


Interview of trader Sh. P. Ashok Kumar at Begum Bazar, Hyderabad

Begum Bazar, Hyderabad is a common and local market for buying and selling of Herbal raw material. In this local market various small, medium and large exporter and importers are working and engaged in procurement of different herbal raw material sourced from different part of the country. The farmers, tribal people and middle man are also come to meet out their requirement of herbal raw material like Aloe-vera, Aonla, Aswagandha, Soapnut, Tejpat, Cinnamon, other spices, gums, dry fruits and other Ayurvedic and Unani raw materials. During the visit to the market the interview was arranged at the shop of Sh. P. Ashok Kumar, the owner of M/s P. Kishan Lal Ashok Kumar, Exporter & Importer of different herbal product. It was informed by the owner that herbal raw material procured from farmers, tribal people, forest dwellers and sometime herbal raw material are also procured through auction arranged by the forest department time to time in a year.

Various manufacturing units of herbal products are purchased different herbal raw material from the firm, as stated by the owner that company take about 15-20% margin on the sale of raw material. The margin of the company may differ time to time and depends on the cost of the raw material procured by the agency. Begum Bazar, Hyderabad is a major market for herbal raw materials and more than 20 traders are operating their business of export and import of raw materials to various agencies. Some major agencies are exporter and importer and government suppliers of Ayurvedic and Unani raw material, minor forest produce, spices, gums, dry fruits and chemicals are: Bombay Trading Co., Srinivas Attal, Balmukand Hanumandas Sharda, Herbal World, Bhairav Enterprises, Andariki Ayurvedam Siddha, Nagarjunam ayuvedalayam, Trade India, Happy Home Needs, Glowing Herbal & Ayurvedic Health Store & Clinic, Dhanwantari Health Care, Vintage Herbals & Ayurvedic, Maharshi Aatreya Ayurveda Nilayam, Rajendra Ayurvedic Distributor, Patanjali Aarogya Kendra, Arvinda Naturals, Maharshi Ayurveda Aushadhalayam, Maharshi Ayurvedam, Sri Sai Shiva Dawasaz, Swadeshi herbals and Acharya Ayurveda Aushadalayam**.**

5.12 Marketing of Aloe-vera at road side

During of the visit of Nalgonda District Headquarter with the Extension Officer of Telangana State Medicinal & Aromatic Plants Board, it was observed that a vendor was selling juices of different taste in combination with Aloe-vera juice. It was new marketing initiatives observed at the road side under the banner of SSF Natural Drinks in a kiosk. Different kind of juices mix with Aloe-vera like Basil, Mint and lemon were available in the kiosk. There was lot of foot fall of the people walking through the road and were enjoying the healthy drink.

New marketing initiatives at road side for Aloe-vera in Nalgonda

The owner of the kiosk interviewed and opined that fresh Aloe-vera leaves procured from Chennai @ Rs. 30/kg including transportation and other costs. The owner of the kiosk was not aware that the Aloe-vera is being cultivated in Nalgonda district itself. During the interview it was informed that he may purchase the fresh Aloe-vera leaves from the local farmers growing Aloe-vera in Kothularam village at cheaper price. He was selling Ale-vera juice with different flavour @ Rs. 40/- per glass and 1 ltr. @ Rs. 100/-. It can be a new marketing initiatives for Aloe-vera if a network is developed with the local farmers those are growing Aloe-vera in the area. It was appraised to him if he purchased fresh Aloe-vera leaves form the local growers he can not only minimise the cost of procurement but also will be a tool of marketing to the local growers and procure the fresh leaves form the local growers at a cheaper price say Rs. 15-20 per kg. This kind of small initiatives can enhance the local consumption of Aloe-vera in tern the demand of fresh Aloe-vera leaves will be increased. This kind of kiosk can be open up at the level of district headquarters with a connectivity of local growers.

CHAPTER 6
SCOPE OF THE REPORT

- Analysis of value chain of Aloe vera, Ashwagandha and Aonla
- Study the gaps in international and domestic market in marketing of Aswagandha, Aloe-vera and Aonla produced in India.
- Developing market linkage and report writing and suggestion on policy issues
- Extracting major potential markets for Telangana
- Price and consumption analysis; comparative study of India and Telangana
- Major bottlenecks of growth of the Telangana market for Ashwagandha, Aloe vera and Aonla.
- Detailed market analysis of the three produces of interest.
- Cultivation scenario of Telangana for the produces and major scope of improvements in cultivation

6.1 Approach of study

- Market analysis was done for Ashwagandha, Aloe-vera and Aonla.
- Market survey was done to determine the demand for Ashwagandha, Aloevera and Aonla to provide information for establishing forward market linkages.
- Identify present and potential market and analysis of price fluctuation.
- Survey of area of cultivation/gathering of plants was carried out to collect the background information through structured schedules.
- The existing value chain would be studied to identify gaps.

6.2 Rationale of study

Marketing of medicinal plant has been challenging area to the cultivator as well as the researchers. The reference of few studies are available as a literature. The area is needed to give deep attention on marketing aspects, study in the gaps in the marketing, demand and supply and entire value chain of these medicinal plants. The rationale of the study is to sensitize the stakeholder, collector and aggregator of medicinal plants in general and particular for the crops selected for the study and help them to adopt the scientific process and also enabling them to save the nature. During the study the data was collected through structured questionnaire. Collected data was analysed and fact full conclusion drawn. The finding of the study will be helpful in planning of marketing strategy, encouraging farmers and aggregators towards scientific digging and stakeholders.

6.3 The relevance and expected outcome of study

The outcome and deliverables of the study are under:

- Study the present practices of marketing of identified medicinal crops.
- Analysis of gaps in existing value chain, including demand and consumption pattern of last four years of three species.
- Database generation in terms of compilation of existing and potential buyers in the state and in the country and to suggest the pricing strategy.
- Study the demand and consumption patterns and identifying the reasons of price fluctuations.
- Study of certification of the industry.
- Stakeholders' capacity building programme for farmers.

6.4 Specific objectives

- Increase efficiency in market linkages of identified medicinal crops for the benefit of growers /assemblers in Telangana state.
- To achieve these objective primary and secondary data will be collected from the area of study align with the objectives of study. Analysis will be done and final conclusion and findings will be drawn from the study.

CHAPTER 7
RESEARCH METHODOLOGY

The area of study was Telangana state to find out the status of cultivation and market of Ashwagandha, Aloe-vera and Aonla plants. To collect the data from the study area following strategy was adopted.

The methodology was decided at initial phase of the project to collect the data from different stakeholders. The methodology adopted is tried and tested to develop a successful investigation that can address the problem statements accurately as per the objectives of the study.

Research methodology is a systematic way to solve a problem and draw logical conclusion. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. It is also defined as the study of methods by which knowledge is gained. Its aim is to give the work plan of research.

One should note that even if the methods considered in two problems are same the methodology may be different. It is important for the researcher to know not only the research methods necessary for the research under taken but also the methodology. For example, a researcher not only needs to know how to calculate mean, variance and distribution function for a set of data, how to find a solution of a physical system described by mathematical model, how to determine the roots of algebraic equations and how to apply a particular method but also need to know (i) which is a suitable method for the chosen problem?, (ii) what is the order of accuracy of the result of a method? (iii) What is the efficiency of the method? And so on.

7.1 Sampling Technique

In research terms a sample is a group of people, objects, or items that are taken from a larger population for measurement. The sample should be representative of the population to ensure that we can generalise the findings from the research sample to the population as a whole. To draw conclusions about populations from samples, we must use inferential statistics, to enable us to determine a population's characteristics by directly observing only a portion (or sample) of the population. We obtain a sample of the population for many reasons as it is usually not practical and almost never economical.

1 **Sampling of village:** Sampling of villages was done to study the cultivation/collection practices of the farmers. First of all convenience sampling is used to select the districts. Under this study only 8 districts from Telangana state were chosen to conduct the survey and to collect the date from bottom line. The farmers are picked randomly from each of the selected district. For understanding the cultivation practices of each produce, primary survey was done in the sample districts of Telangana.

2. **Data collection from Mandies:** The next part of survey is done to analyse the existing and potential market of the produces. For the same, the herbal market of the concerned produces were studied in major markets of India to understand the demand-supply scenario, export and domestic market, consumer preference, industrial requirement & procurement channel, Telangana's present share, price spread, mandi efficiency etc. as per the objectives of the project. A few major companies are selected for investigation purpose as well as case study analysis. The herbal market in India is predominantly irregular with a few exceptions in some part of the country. The herbal markets are categorized into grades in terms of the amount of business it does annually. The markets chosen for survey are those that have maximum business in ashwagandha, Aonla and Aloe-vera. Most major regular markets of herbal produce were considered for interviewing the traders, middle man, collector, aggregators, whole sellers, retailers. A sample of 20% traders is chosen randomly from each market and for each of the three produces. Extensive survey was carried out for the collection of data from the market segment. The data was collected with the help of structured questionnaires designed for the purpose. During the data was collected from Hyderabad, Chennai, Vishakhapattnam, Jabalpur, Neemuch, Pratapgarh, Unjha, New Delhi, Jaipur, Bangaluru, Kolkata and other small markets and mandies. For the data collection from the market personal interview and interaction was organized with representative of the segment. However, the study was consist only on Telangana state, but to find out actual marketing information for the crops other markets as given above were also explored to collect the data and to draw the clear picture of the market.

   a) **Neemuch Mandi:** This market is the largest supplier of herbal produces around the country.

b) **Thrissur market:** Thrissur is the biggest market in Kerala, the hub of herbal business.

c) **Khari Baoli:** This market is situated in Delhi and it absorbs the herbal trading of North India.

d) **Pratapgarh and Raipur markets:** These two markets are core traders of aonla. Pratapgarh is known for aonla cultivation and Raipur has abundance of wild fruit for trading.

e) **Mumbai Vasi:** This is the export nucleus for every matter.

f) **Katni market:** Katni was once one of the most renowned places for wild aonla. 80% of the material is procured by Dabur alone.

g) Jabalpur Market, Vishakhapattanam, Jaipur, Kolkata were also surveyed for the purpose.

The above markets were surveyed thoroughly and questionnaires were filled by traders to understand various parameters discussed in other parts of the document.

3. Data collection from industry: For industrial analysis, data is collected from 30 industrial organizations that include micro, medium and large organization. The sample size was approximately 10%.

Table 6: Collection of data from different segment

Name of company	Location	Purpose of visit
Dabur processing unit	Jabalpur, Madhya Pradesh	Data is collected regarding the processing of aonla, procurement process of aonla, demand of Dabur for aonla in last five years, quality assurance technique, technological innovations ; case study analysis of Dabur aonla pishti
Vijay Durga Wineries	Hyderabad, Telangana	Case study on aonla wine and its potential in wine market, aonla farming techniques prevailing in Telangana.
KSM 66	Hyderabad, Telangana	KSM 66 is the most renowned organization for ashwagandha procurement. End to end study of its procurement, business scope, buying preference, quality assurance etc.
Natural remedies	Bangalore, Karnataka	Analysis of export scenario of herbal medicines and food; major bottlenecks of export, requirement of certifications and clinical research for export in different nations across the globe.

Name of company	Location	Purpose of visit
Saini laboratory	Bangalore, Karnataka	To study the scope of fresh aonla against dry aonla, demand analysis and usage in natural medicines.
GCC processing unit and head office	Vishakhapatnam, Andhra Pradesh	To collect data on collection techniques of GCC from tribal dwellers, current processing techniques used, gap existing in the channel of procurement.
Aushadhi	Thrissur, Kerala	Studied public sector organization working on herbal medicines; difference in scope, procurement, price, technology, and demand from private sector; understanding the Kerala medicinal herb market.
Bio park	Chennai, TN	Studied public sector organization working on herbal medicines; difference in scope, procurement, price, technology, and demand from private sector; understanding the Tamil Nadu medicinal herb market.
Bio park	Chennai, TN	Studied public sector organization working on herbal medicines; difference in scope, procurement, price, technology, and demand from private sector; understanding the Tamil Nadu medicinal herb market

a) **Preparation of questionnaires:** The questionnaires for the data collection from farmers, traders, industry segment were designed and data was collected through structured questionnaires. The questionnaires was designed to fulfil the requirement of the study and math up with data mapping for the purpose.

b) **Source of primary data:** Primary data was collected through personal interview with various stakeholders like farmers and forest dwellers, traders, commission agents, distributors and retailers, industrial and government processing units, NGO and tribal welfare associations, Government departments, manufactures, middlemen, collector, aggregators, processors and industry segment through structured questionnaires designed for the purpose.

c) **Source of secondary data:** Secondary data for the study was collected from various department and agencies for the purpose through detailed interview and interaction meetings with representatives of the agency and department identified and listed below:

1. Telangana Agriculture Marketing Board.
2. Department of Agriculture, Telangana.

3. Department of Horticulture, Telangana.
4. Department of Industries, Telangana.
5. Department of Food Processing, Telangana.
6. Export Promotion Council, Telangana.
7. SMPB and NMPB, Telangana and Delhi respectively.
8. Aranya Bhawan, Department of Forest, Telangana.
9. Shandi at various districts.
10. State Livelihood Mission, Telangana.
11. Girijan Cooperative Corporation, Vishakhapatnam, district society offices and processing units.
12. Social and Tribal Welfare, Tribal Welfare Department, Telangana.
13. Centre for People's Forestry, Telangana.

Many line departments were approached in this context to share their data. Some of them are as follows:

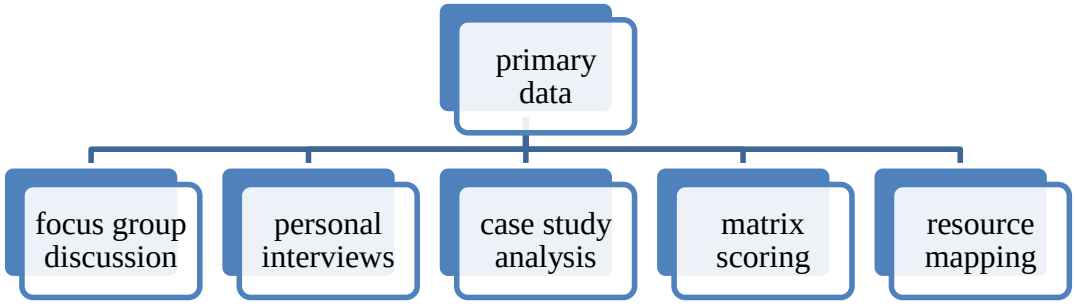
Table 7: Name of line departments

S. No.	Name of department	Data collected
1.	State medicinal plant boards of various state	State based data on the concerned produces.
2.	Bio diversity board of various states	Data of access benefit sharing reported by different organizations of the states.
3.	Forest departments of various states	Policies related to NTFP
4.	APMC offices	APMC data of the particular market on arrival and price variations.
5.	Department of horticulture	Data on production, yield, area.
6.	Department of agriculture/ agri marketing board	Data on production, yield, area
7.	GCC Telangana	Data on wild aonla collection after bifurcation of state, issues faced by collectors, issues in marketing of wild aonla, present processing techniques.
8.	Export council board	Data on export and import of the produces for last 5 financial years.

S. No.	Name of department	Data collected
9.	CMAP Telangana	Required specification for produces as per industry standard.
10.	NMPB Delhi	List of major traders; data submitted by various companies.
11.	IIFM, Bhopal	Secondary data on aonla as an NTFP produce wild aonla collection and marketing; list of traders in Telangana trading in wild aonla, aloe vera and ashwagandha.

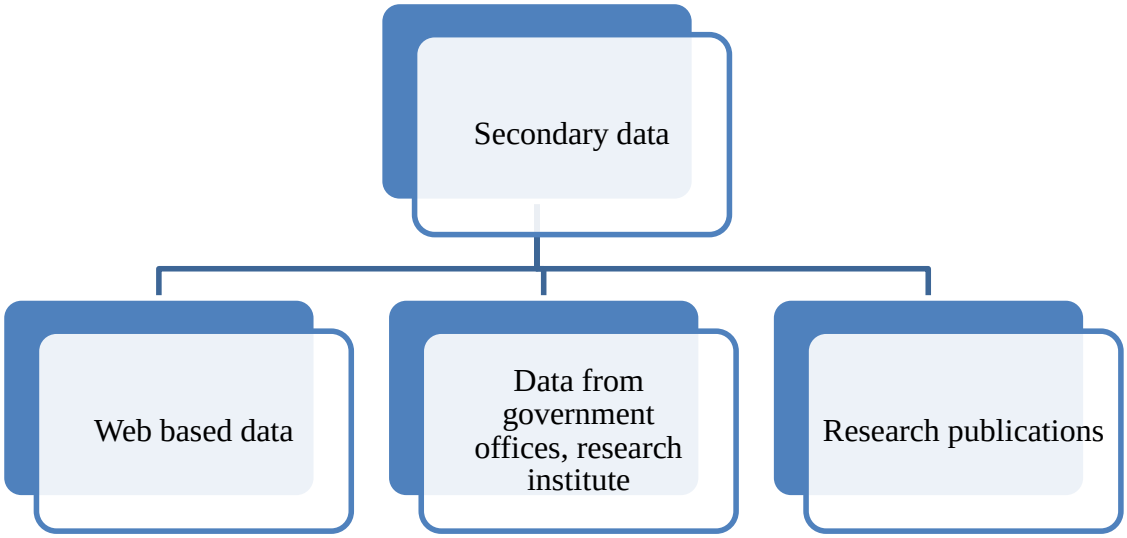
7.2 Data Collection Techniques

The data is collected by two methods namely primary and secondary. Information you gather can come from a range of sources. Likewise, there are a variety of techniques to use when gathering primary data. The following pages in this segment will discuss deeply on how data has been collected.



1. **Focus Group Discussion:** FGDs were conducted among the farmers' groups and traders' association members in a group of 8 to 10 members for collection of primary data.
2. **One to one interviews with stakeholders:** Data was also collected from the stakeholders by organizing one to one interview and different questionnaires are formed for each stakeholder, line departments, and industry personnel to conduct personal interviews.
3. **Case study analysis:** This is the most important analysis for qualitative study and it is done through filling a customized questionnaire for each case of study.
4. **Matrix scoring:** This technique of data collection consists of a matrix of factors which are scored by the stakeholders and farmers.

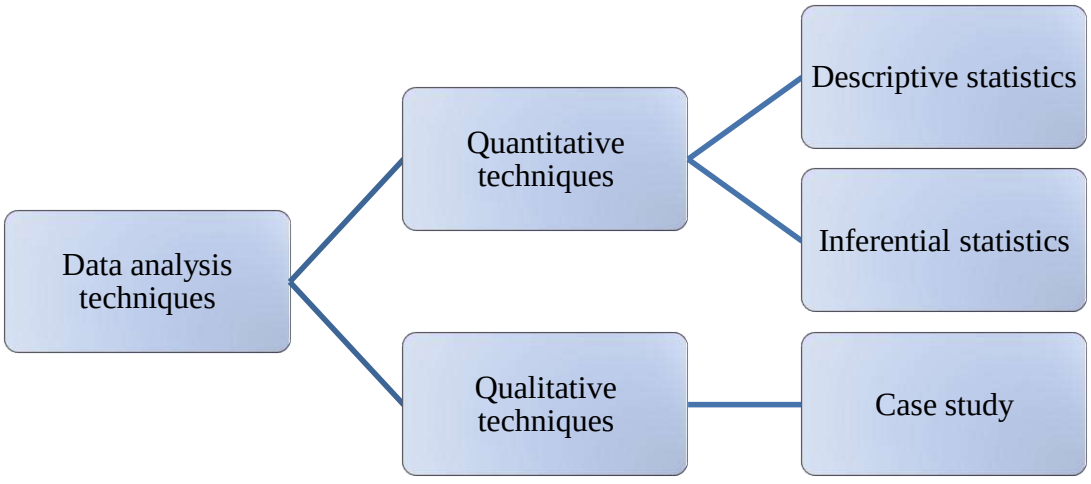
5. **Resource mapping:** Resource mapping is an important component to understand the distance from market, resources available in the village, area available for agriculture, irrigation facility, accessibility to road, electricity and other important resources of a village.



Secondary data was collected from three major sources namely web data, from related organizations and published papers. Data is collected from multiple sources to ensure reliability and coherence.

7.3 Data Analysis Techniques

Data analysis is done adhering to quantitative as well as qualitative techniques. The methods used under the techniques are mentioned below:



7.4 Quantitative Data Analysis

There are two ways of quantifying the data collected namely descriptive data analysis and inferential data analysis. The techniques used in descriptive data analysis are measuring the central tendency through mean, median, mode, as well as through percentage analysis. The techniques used in inferential analysis involve many regression techniques, finding correlation among variables etc.

Other methods used are Likert chart, price spread analysis, activity analysis and channel efficiency measurement.

The features of this technique are:

- Emphasis on quantification in data collection (variable-centred)
- Often used to test theories
- Large samples of data
- Goal is to represent whole population
- It is important how data is collected
- Sometimes data already exists
- Often existing data is not questioned / reflected

7.5 Qualitative Data Analysis

Qualitative data analysis involves only case study analysis of different stakeholders.

- Emphasises words rather than numbers (meaning-centred)
- Describing the social world as seen through the eyes of the subjects to discover how it is constructed
- May reveal aspects that even the subjects did not realise
- Often requires skills for data collection acquired in practice
- Less well defined approaches
- Methods
- Ethnography: studying a culture
- Unstructured Observation: participant / non-participant
- Interview: unstructured rather than structured
- Focus group

7.6 Sample for Final Report

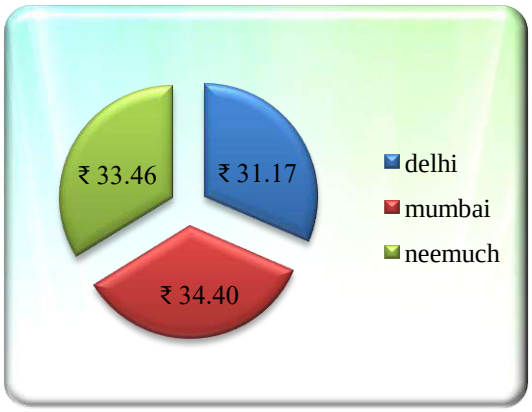
- The next section of the document is a sample serving as a justifying proof of the work and investigation done till present time.
- It should be noted that the sample is only a reflection of the future final report and not entire array of analysis.

CHAPTER 8

PRICE TREND ANALYSIS

The price trend is used to analyse mainly 3 aspects of price volatility namely seasonal trends, market wise price volatility and increment or decrement in price from last year. To analyse the trend major 4 markets of herbal trade are taken namely Delhi, Mumbai, Neemuch and Kolkata. Along with the four major markets, the Hyderabad market is considered. For every unavailable data, a zero is substituted.

8.1 Aloe-vera



Aloe vera is sold in traces in all major markets. As per our chosen market, Kolkata and Hyderabad did not update its data. Therefore, analysis is done with data collected from Neemuch, Mumbai and Delhi. The first graph is a pie chart showing the average price of the three major markets of Aloe-vera in India. Mumbai has the highest average price of Rs. 34.40 per Kg closely followed by Neemuch market having the average price of Rs. 33.46 per Kg. The Delhi market on the other hand is reasonable in price on the lowest average price of Rs. 31.17 per Kg. If we see the individual price

in the three markets from 2016 to 2017, we see that only Neemuch has 7 month when price is lower than average. In other two markets, the average price is always higher than individual price of any month. This indicates that stability of Neemuch market is higher than Delhi and Mumbai market. Here the deviation on the lower and the higher end is the lowest one i.e. + 34.4% to -25.2 %. Before moving further let, we first see the highest and lowest price in these three markets.

Table 8: Highest and lowest price in three markets

Name of market	**Delhi**	**Mumbai**	**Neemuch**
Maximum price incurred (Rs/kg)	50	55	45
Minimum price incurred (Rs/kg)	36.7	30	25
Deviation range from average	+60% to -17.7%	+59.8% to -12.7%	+34.4% to -25.2%
Neemuch market reflecting more stability in price than other two markets			

In the above charts and tables, we have analysed the price of Aloe-vera in different major markets. Mumbai has been the costliest market with highest average as well as highest maximum price. Neemuch has seen low fluctuation and the ranks second in average price incurring. Delhi is more volatile market where price went up to 60% and came down to 17 % both above the average price. Only Delhi never saw its price fall below the average price. Mumbai is the most volatile market with price rising up to 60% above average and falling down to negative 12% below average.

Data Interpretation: The reason behind the Delhi market more volatility however having a price range above the average price range is, it is having a geographically central location from the market point of view both to the cultivators, middlemen, aggregators, retailers and wholesalers. More competition has resulted into more volatility in the Delhi Market. However, the same intensive competition has resulted into a better average price than any other market. Neemuch has seen lowest volatility because although it is very close to the cultivators and collectors of the Herbs, however, it is having a distance from the purchaser so competition is comparatively low in this market. Since the competition is less than Delhi market so average price is also on the second highest side since average demand is always maintained. The most volatility of the Mumbai market is because of the reason that it is far away from the

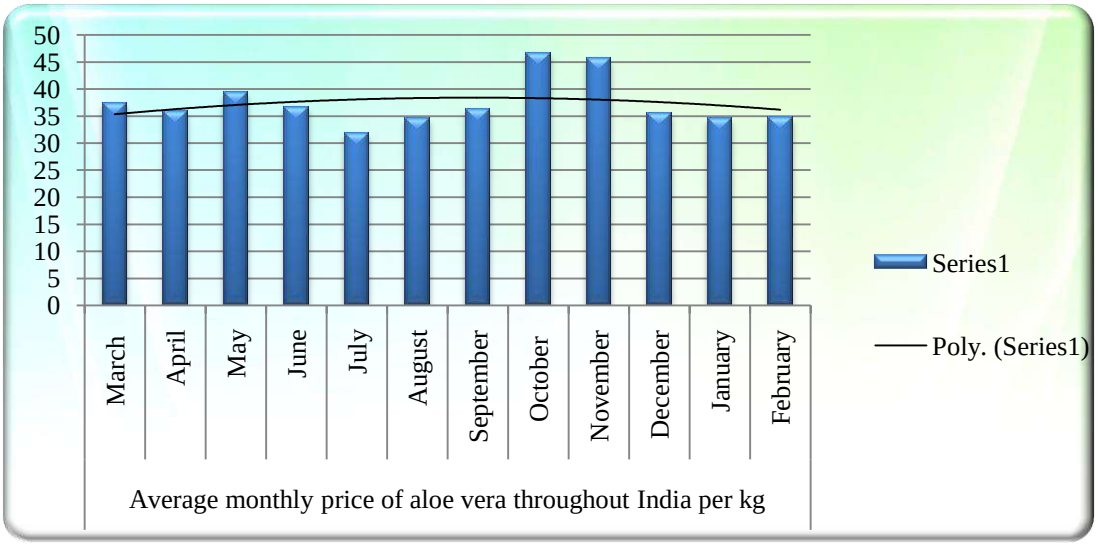
cultivators, aggregators and collectors of the Herbs so the supply side always fluctuate, hence, resulting into the major fluctuation in the price depending upon the demand and supply gap. Due to the highest volatility the average price becomes on the lowest side in comparison to the Delhi and the Neemuch market. Looking to the entire analysis we may precisely interpret that Delhi is a most appropriate market for those who want to do the marketing of their Herbs. Although based on the geographical locations every market is having its potential and it is not possible to Delhi by the stakeholders situated far from the Delhi.

The table below shows the average monthly price of Aloe-vera in India. To calculate the average price trend in India, the unavailable data is replaced with the average data of the particular market.

Table 9: Average monthly price of Aloe-vera throughout India (per kg)

Average monthly price of Aloe-vera throughout India per kg											
March	**April**	**May**	**June**	**July**	**August**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**
37.3	35.8	39.3	36.6	31.6	34.5	36	46.6	45.6	35.4	34.4	34.6

It is observed from the analyse of the given data of the average price of Aloe-vera per kg throughout India are lowest average prices in the Jan-March Quarter and highest in the October-December Quarter followed by the July-September Quarter and April-June Quarter. Although on an average, the price fluctuation is not too much throughout the year.



The data table above shows the average price per kg of Aloe-vera in India. The next graph will give a graphical representation of the price trend over 12 months. January-March Let us now see how price moves in India seasonally.

August to November is the best price-receiving period for the growers. The average price during this period is more than the average price of rest of the year. The average price in India is Rs. 33/ kg it is seen from the graph we find more than 80% of the time the price is slightly over average, indicating there is less seasonality in price of aloe-vera around the year. Aloe-vera is sold in these markets after the initial processing of drying or extracting. Hence, the price does not depend on the harvesting season. But it should also be noted that the high price period of August to December is because traders prefer buying fresh material of the season. According to few traders at Neemuch mandi, the reason of a dip in price in July, when traders preferred waiting for a month for new arrival.

Table 10: Price difference and deviation

S. No.	Markets	Delhi	Mumbai	Neemuch
1.	**P**rice difference from last year	+12	+30	-5
2.	Deviation in average price from national average	-1.73	1.5	0.56

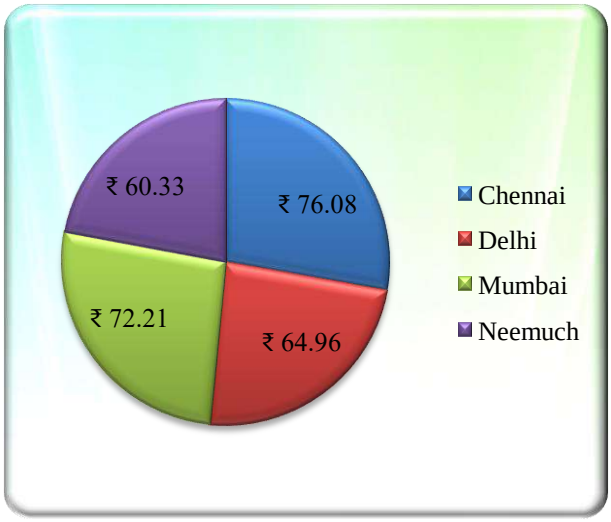
The above table is charting the price difference from last year and difference between price in the given market in a month and price in the same month in the previous year. The second row is comparing the national average market price with the average market price in the particular market.

It is observed that the price has risen very high in Mumbai market whereas there is a slight dip in price in Neemuch market. The second row indicates only Delhi has price lower than the national average.

Data Interpretation: The nature of the Aloe-vera is that it can be normally cultivated round the year, and the demand pattern is not much fluctuating although the demand is in the increasing trend. However the Delhi market seems to be the most potential one with Mumbai as the most stable one. Neemuch market seems to be least connected with the market so offer a dip average price as a whole.

8.2 Aonla

We will now carry out a similar analysis for Aonla. Instead of Kolkata here we have chosen Chennai as the fourth market due to availability of data and similar size & traits of market. For Aonla too Telangana did not update the price list. As a result, the four samples chosen market are Chennai, Delhi, Neemuch and Mumbai.



First let us have a look at the average price of Aonla in the markets of Neemuch, Delhi, Chennai and Mumbai. The pie chart at the right shows that Chennai has the highest average price of Rs. 76.08/- in the markets of study followed by Mumbai which is having the average price of Rs. 72.21/-. Delhi stands at third number with Rs. 64.96/- as average price and least price is received at Neemuch market of Rs.60.33/-.

Though Chennai has the highest price it should be noted that only four months have higher price than average price in this market. The market average went high due to excessive demand in last April. The median price is Rs.72.5/- still making it higher than the other markets. Now viewing the data for Mumbai, it is found that that exactly 6 months have higher price than average of the market. The median price here is Rs.70.00/- indicating a fair stability in the prices. The third rank is Delhi followed by Neemuch. In these two markets, like Mumbai, exactly 6 months have price above the average price of the markets.

Table 11: Average price of the markets

Name of market	**Chennai**	**Delhi**	**Mumbai**	**Neemuch**
Maximum price incurred (Rs/kg)	100	82.5	90	85
Minimum price incurred (Rs/kg)	68	55	60	49
Deviation range from average	+31.5% to -10.5%	+27.1% to -15.25	+24.65% to -16.8%	+40.8% to -18.7%
The table calculated Neemuch as highly unstable market with highest price deviation.				

The above table shows that Neemuch market has the highest deviation range indicating high price seasonality. The other three markets have similar range of deviation. The maximum shoot in price is in Neemuch but highest price incurred was in Chennai. The maximum fall in price was in Neemuch and Neemuch also fetches minimum price of Aonla.

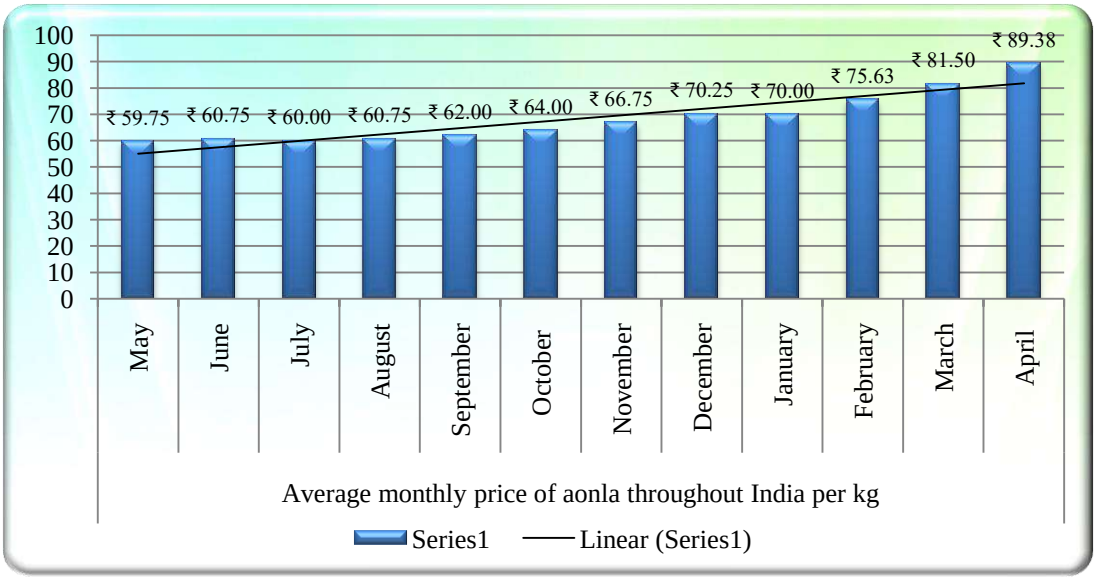
Next, let us see the average price of Aonla in each month of the year. The table given below gives a month wise list of price of Aonla in India. The table will give a better insight about seasonality in price and the impact of harvesting season on price of Aonla in India.

Table 12: Average monthly price of Aonla throughout India (per kg)

Average monthly price of aonla throughout India per kg											
May	**June**	**July**	**August**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**March**	**April**
59.75	60.75	60	60.75	62.00	64.00	66.75	70.25	70.00	75.62	81.50	89.37

From the above table, it is evident the movement of price of Aonla in India. The data is taken from May 2016 to April 2017 from all four major markets of Aonla.

Table 13: Average monthly price of Aonla throughout India (per kg.)



The above graph is a neat linear trend with a positive slope from May to next April. The blooming period in price is from December to April. In the month of May, the price fell one third to its price in April. The price stayed stagnant until September and from the next month, it grew to a significant change. It can be noted that Aonla price heavily depends on harvesting period. The lean months are in mid-summer season for both dried as well as fresh Aonla produce.

Next we will compare the last price change happened in a year and which markets have prices higher than the national average.

Table 13: Price difference from last year

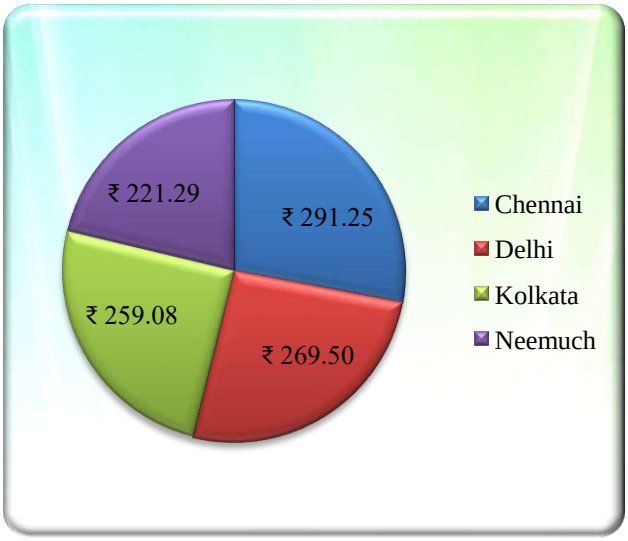
S. No.	State	Chennai	Delhi	Mumbai	Neemuch
1	Price difference from last year	5.66	11.66	4.50	13.00
2	Deviation in average price from national average	+7.69	-3.44	+3.81	-8.06

The above table shows all markets have shown positive price rise from last year and have positive impact on marketing activity. The price rose the highest in Neemuch followed by Delhi. Chennai and Mumbai on the other hand show slight improvement even after being the costliest markets in the country. The positive trend indicates the willingness of traders to pay more for Aonla in 2017 than 2016.

Data Interpretation of Aonla

From the given data we may interpret that the Mumbai Market is having the highest stability in the price. There is a steep downfall in the average process of Aonla after March due to decline in the demand of its applied products like Chyawanprash etc.

8.3 Ashwagandha

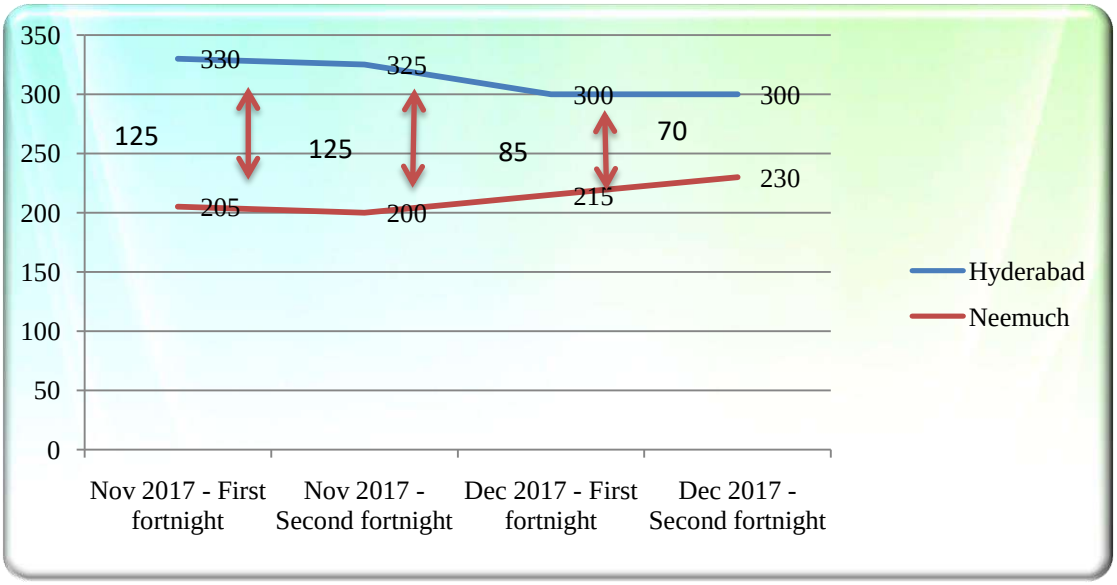


Ashwagandha has found applications in weight loss industry and general wellness in recent times. This increasing note is due to awareness among consumers about health and body. Industry giants like Himalaya and Patanjali produces Ashwagandha tablets along with using as an ingredient in different drug formulations used for health improvement. The best-demanded Ashwagandha is found in the dry soils of Rajasthan regions ie. Nagaur and other dry part of Rajasthan. Neemuch has placed itself as the market hub for ashwagandha roots in the country and majority of roots and other parts of ashwagandha is being traded through Neemuch mandi. Traders from all over the country come here to purchase Ashwagandha. It will be interesting to note the price comparison of Ashwagandha in Neemuch with the rest of the country. The pie chart shows Neemuch as the cheapest place to find Ashwagandha.

The Chennai market has the highest price followed by Delhi and Kolkata respectively. The main reason for such high gap is the fact that traders first sale their produces at Neemuch mandi. From Neemuch mandi again, the material is supplied to rest of the country. Also, the manufacturers have preference in buying material from Neemuch as majority of roots come there from Rajasthan that bears higher active ingredient than produces from other part of the country.

Next, we will see how the Hyderabad market price is different from Neemuch market. For the same data is considered in four samples. The first sample is from November first fortnight followed by second sample as the second fortnight. The third and fourth samples are the two fortnights of December.

Table 15: Difference of price of Ashwagandha in Neemuch and Chennai mandi

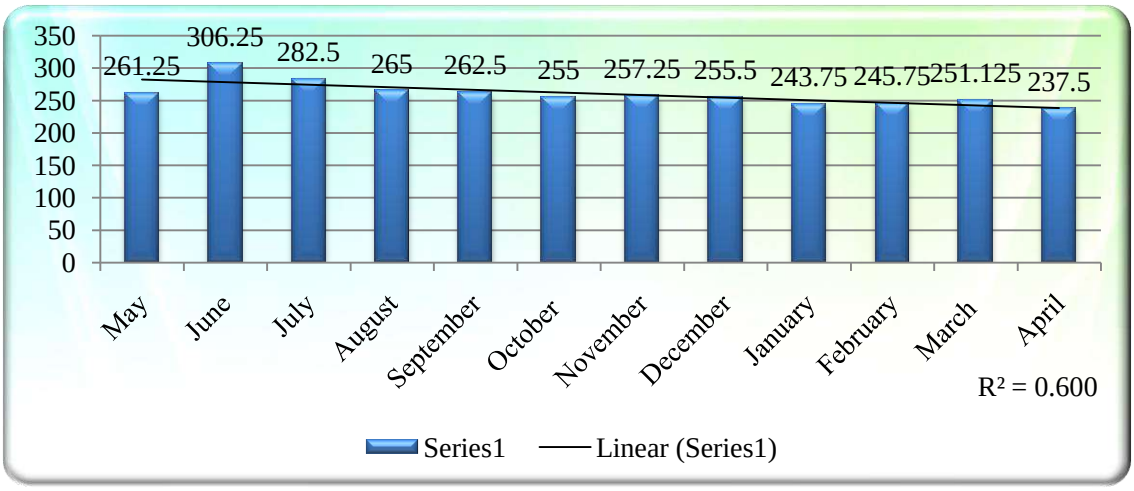


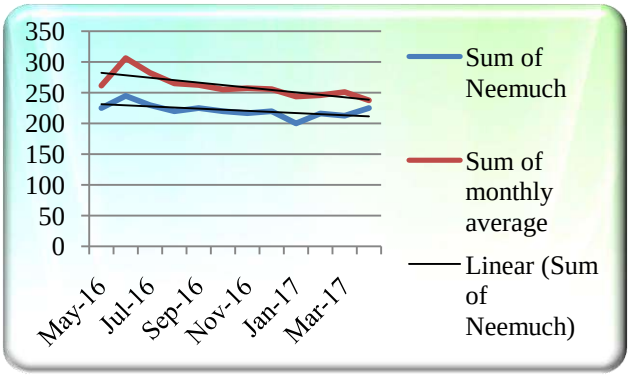
The above chart represents that there is a significant difference in price of Ashwagandha between Hyderabad market and Neemuch market. It is evident that Hyderabad market is very costly compared to Neemuch market. Due that reasons, mostly buyers interested to bulk from Neemuch market as it offers lower price of produce. The average difference in price is Rs. 101.25 per kg which means Hyderabad sells Ashwagandha at a rate of 48% higher than what is sold in Neemuch. This is a clear suggestion that Hyderabad has scarce raw material and as stated above, the state level traders go to Neemuch and sell the same at Hyderabad. It has been reported by the major traders of Neemuch that the increase in demand has gone up to 50 % higher in Andhra Pradesh region.

Table 14: Average monthly price of Ashwagandha throughout India (per kg)

Average monthly price of Ashwagandha throughout India (per kg)											
May	**June**	**July**	**August**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**March**	**April**
261.25	306.25	282.50	265.00	262.50	255.00	257.25	255.5	243.75	245.75	251.12	237.50

Next let us see how the price of Ashwagandha fluctuates month wise throughout the country. The table above shows the average monthly price during the period from May, 2016 to April, 2017. The same data is also shown in the graph given below:





The significance of the graph is to show the linear trend in seasonality of price of Ashwagandha. But if we see the slope of the trend line, it is observed the price doesn't change drastically over the seasons. This indicates price of Ashwagandha is stable irrespective of any season. The highest price is received in the month of July and the least in the April. As we have mentioned that the price of the Ashwagandha largely depends on the price of Neemuch market alone, let us see if it really holds true for all seasons through the next graph. The two lines in the chart shows how the price of Neemuch and the average price of India runs throughout 12 months from 2016 -17. The two lines run parallel in 10 months in a year. This suggests that Neemuch demand and supply of Ashwagandha determines the supply and price for most parts of the country.

Next discussion on Ashwagandha price is to determine the compare the country averages with the average in different major markets.

Table 15: Price difference of price of Ashwagandha in various markets

S. No.	Component	Chennai	Delhi	Kolkata	Neemuch
1	**P**rice difference from last year	-30	-75	-42	-17
2	Deviation in average price from national average	30.97	9.22	-1.2	-38.99

The price of Ashwagandha produce compared at same month last year in 2016. However, Neemuch always have the least price of produce, the jolt in downtrend of price was felt least by this market. Delhi price went down from Rs.290.00 per kg to Rs.215.00 per kg.

The deviation price from national average is highest at Neemuch market. Though this market has a huge effect on the national average yet its price is way low than the other markets in the country. Kolkata is the only other market that has low price than rest of the country. Chennai surpasses the national average well and Delhi has just managed to stay on the positive trend in this comparison.

Talking about comparison of Telangana market with the rest of the country, we derive at these results.

Table 16: Difference in price trends between national average and Telangana

Difference in price trends between national average and Telangana			
Difference between national average & Telangana average	**Difference between maximum price between Telangana and India**	**The difference in median price between Telangana and India**	**The difference in minimum price between Telangana and India**
+66	0	77	100

The above chart reflects that the price of Ashwagandha is extremely high in Telangana than the country. The second column shows that last year Telangana market faced the maximum price recorded. The difference between minimum prices is as high as Rs.100.00 per kg.

Data interpretation of Ashwagandha

It has been found that the price is quite high in Hyderabad than the Neemuch. Proper logistic and warehousing may lower down this cost. Average prices are almost stable in the market except few months like June and July.

CHAPTER 9

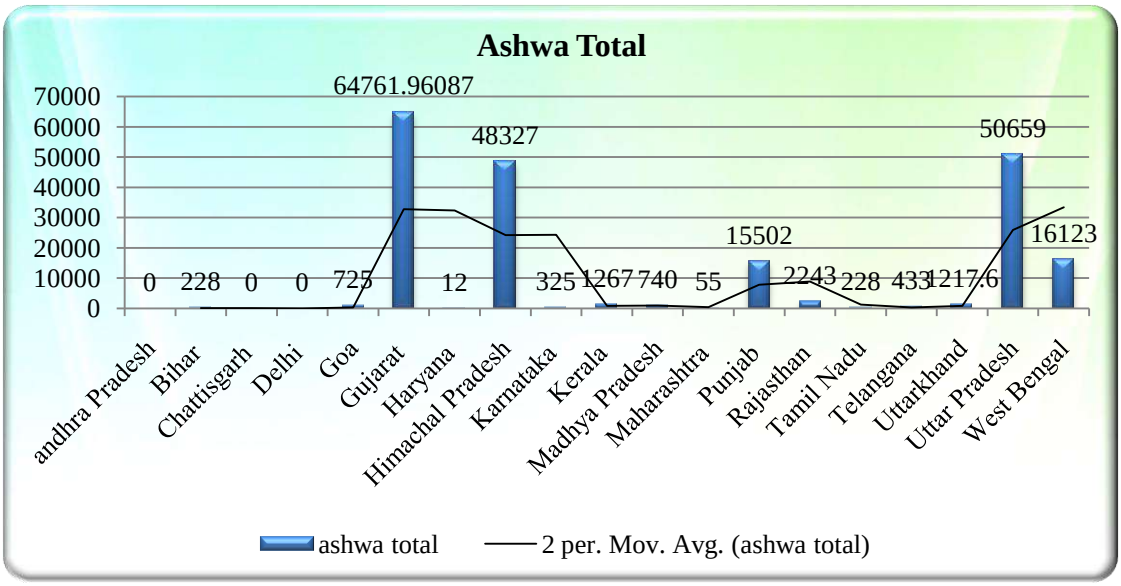
CONSUMPTION TREND

Consumption trend is an analytical measure of consumption using time series or cross-sectional data of particular produce. The significance in this study is to estimate the demand in domestic market in state wise and yearly growth. In this regard, consumption of the three produces will indicate the major markets and analyse the trend of Telangana in using these produces. To find out the logical conclusion as follows different market places were surveyed.

- The major potential markets for Telangana (in terms of consumption only)
- The domestic market trend prevailing in Telangana
- The lowest consuming or low potential markets in the country
- Telangana's consumption ranking with respect to the other states
- Resale markets in the country

To carry out the above tasks a data series of 175 companies have been used as a sample for analysis and to draw logical conclusion. The organized herbal sector has around 3500 companies scattered in cosmetics and drug industries in the country. The sample size of 5% is taken as per convenience sampling technique. The sample has distributes as companies of large, micro and small size. Data is collected over 4 years from 2010-11 to 2013-14 for consumption in each produce and state of base location.

It should be noted that consumption of these produces happen in irregular markets through distributors and agents. Therefore, it is beyond the scope of this document to capture the resold consumption in the unorganized market. The main aim is to find bulk procurers to comprehend the movement of major quantity of raw herbs.



9.1 Ashwagandha Consumption

The first graph under this section named as "ashwa total" is comparing every state on consumption of Ashwagandha for the mentioned period.

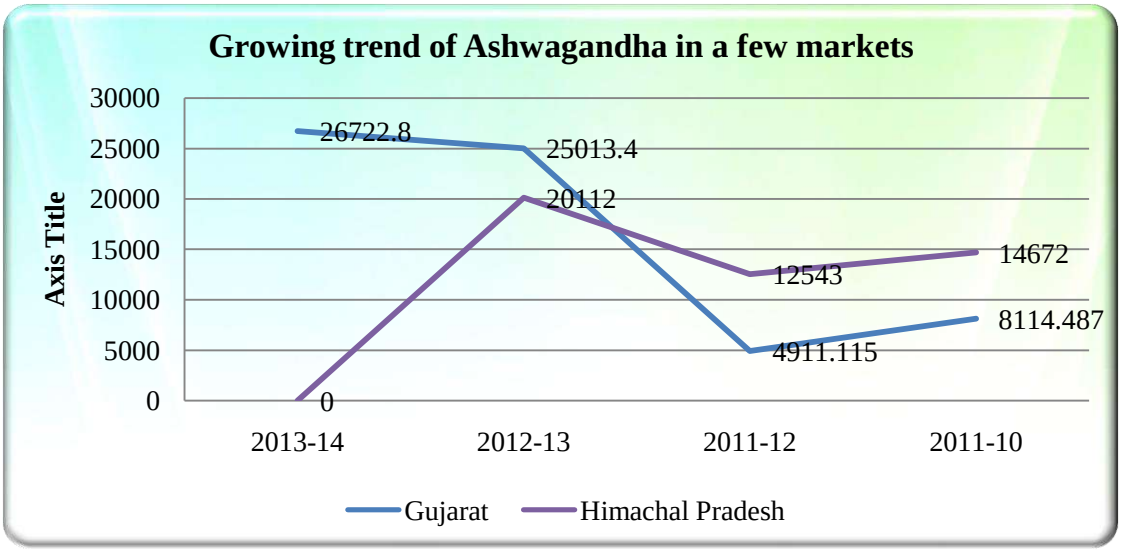
Looking closely at the graph, it is very much visible that Ashwagandha has substantial footprints in only four states. In other states, the presence is negligible. Such high difference can be a result of either better herbal manufacturing units or resale point for other low procuring states. The striking results portrayed are by Delhi, Kerala, Uttarkhand, Karnataka and Tamil Nadu. These states are known as the herbal hubs of the country and Ashwagandha is used readily in many applications in Ayurvedic drugs. The major indication to such result is the presence of a large unorganized sector for the industry or as mentioned in the previous lines, Ashwagandha is resold as the major procuring states can provide bulk material for rest part of the country.

Table 17: State wise consumption pattern of Ashwagandha

S. No.	State	Ashwagandha consumption (kg)	% share of consumption
1	Gujarat	64761.96	31.92
2	Himachal Pradesh	48327.00	23.82
3	Punjab	15502.00	7.60
4	Uttar Pradesh	50659.00	24.97
5	West Bengal	16123.00	7.90
	Total share of consumption by top 5 states= 96.21%		

The above table restates the fact that the entire market of Ashwagandha in the country is accumulated in the 5 states with 96% consumption. Gujarat alone takes away a major chunk of nearly 32% closely followed by Uttar Pradesh and Himachal Pradesh. The growing markets of Ashwagandha are Punjab and West Bengal. West Bengal and Punjab are at nascent stage of consuming so it is too early to predict any trend of growth in these states.

After analysing data of three years consumption trend of Ashwagandha in Gujarat, it can be seen in the graph given as under.



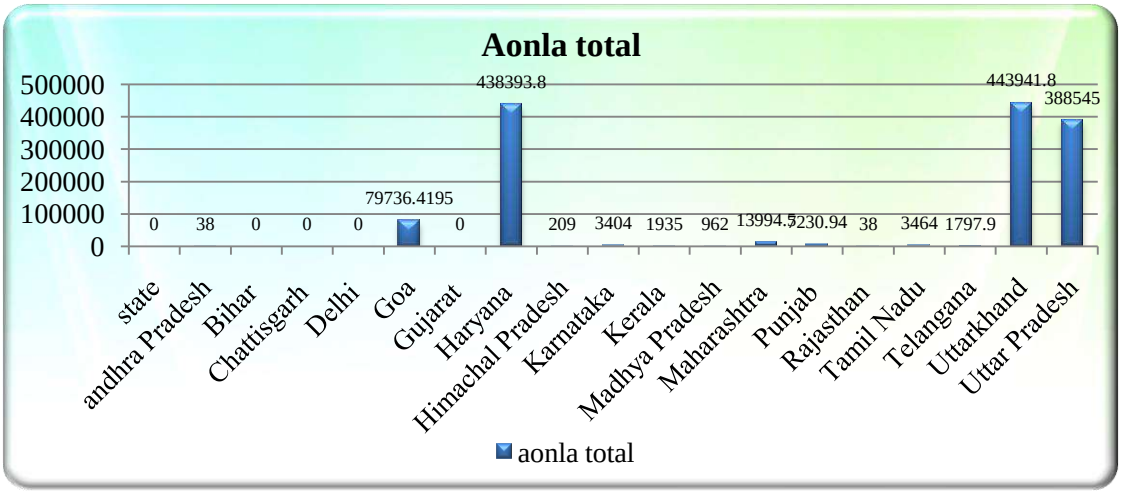
There is a linear increment of consumption in Gujarat with the highest growth faced during 2011-12 and 2012-13. Since then the market has been more stable. It should also be noted that the growth of Gujarat market is as high as 400% in three years. The consumption of Himachal Pradesh went depressed after 2013. From 2010 to 2012 the growth did not follow any trend and a year later it fell to minor purchase of insignificant value.

Uttar Pradesh and Himachal Pradesh have not shown much growth in three years though it has been the best two consumers after Gujarat.

West Bengal has started significant consumption since 2011-12 with increase in growth from previous year of more than 100 %. In next two years West Bengal has been stable in its consumption trend. Punjab on the other hand is only two years old since it has made any registered consumption. In last two years, Punjab has shown tremendous growth with 35% increment in procurement from last year.

9.2 Aonla Consumption

Aonla is the most consumed produce in the entire herbal sector. It is also said that aonla market will never mature as its application increases in every decade of time. The graph below named as "Aonla total" is showing the consumption trend of Aonla across different states of our country.

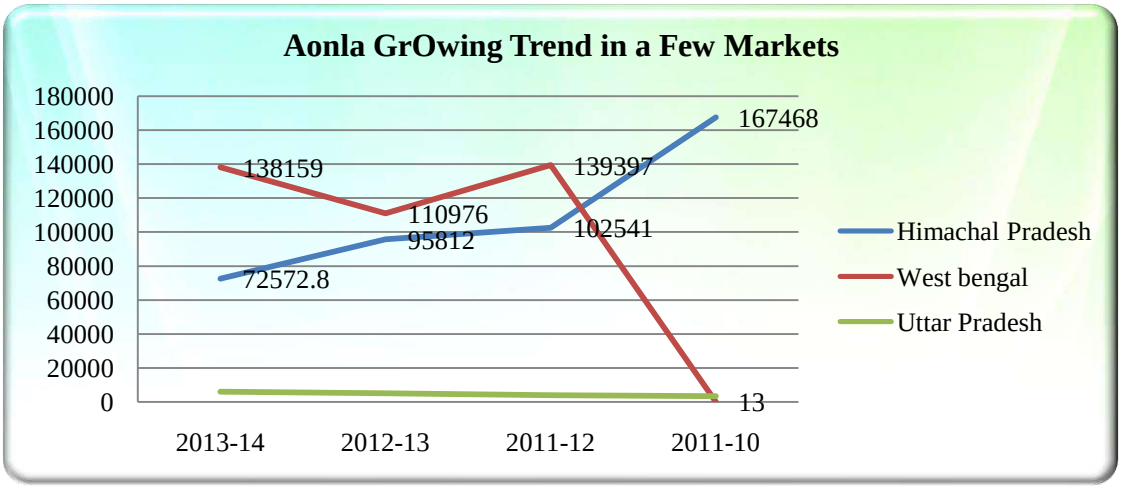


Like the previous produce the consumption of Aonla is also limited to a very few states. There are 3 major states namely Haryana, Uttarkhand, and Uttar Pradesh depleting the entire production of the country. Goa has been another significant consumer of the fruit. The presence of Aonla in other states is noticeable but comparing to the top 4 states there is no significant visibility. The graph above considers both fresh and dried Aonla. In addition, if we notice Aonla is being consumed by the 3 northern states only. This kind of trend again reflects anomaly with other data series used in the document as many other potential markets are seen in the country. As mentioned in the above section, this incongruity is created due to secretive nature of herbal market.

Table 18: Top 4 consuming states of Aonla

S. No.	State	Consumption	% share of consumption
1	Uttar Pradesh	443941.8	32.08
2	Himachal Pradesh	438393.8	31.68
3	West Bengal	388545	28.08
4	Goa	79736.4195	5.7
	Total share of consumption by top 4 states= 97.54%		

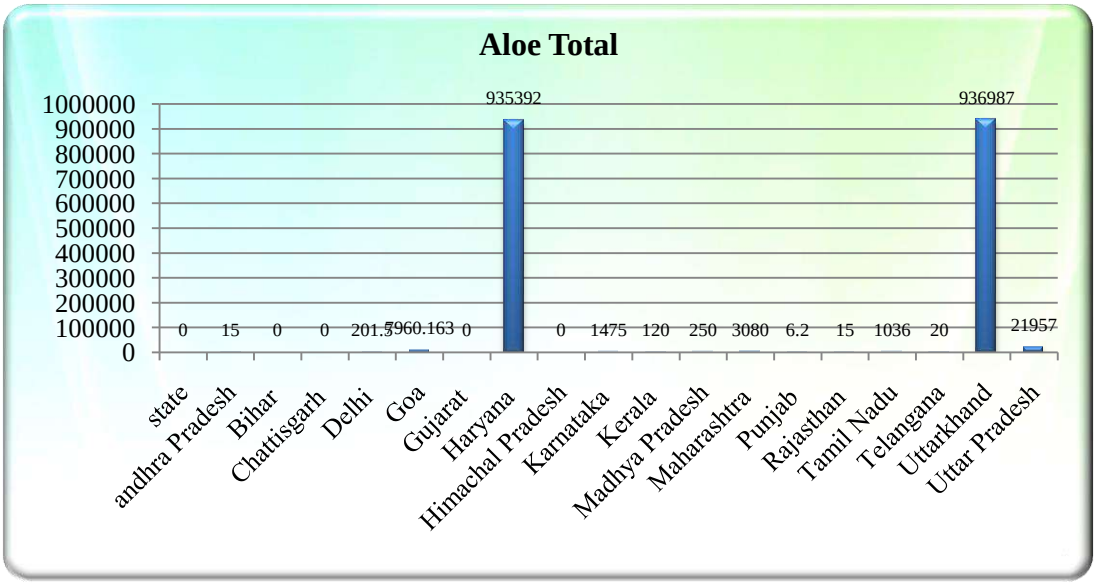
The above table reflects that only 3 states majorly buy Aonla. The overall demand in these three states is almost equal thus unlike Gujarat in case of Ashwagandha, the Aonla market has a bigger geography of equal size. As a result, it will be interesting to see the trend of consumption in all 3 major states.



The growth trend among the top three states shows that Himachal Pradesh has shown maximum growth whereas Uttar Pradesh remains stable consumer. West Bengal on the other hand has decreased its consumption linearly throughout the period.

9.3 Aloe Vera Consumption

The next produce of consumption is Aloe-vera. Aloe-vera finds immense consumption in cosmetic industry. The chart given below named “aloe total” is depicting the state wise consumption of Aloe-vera in last 3 years

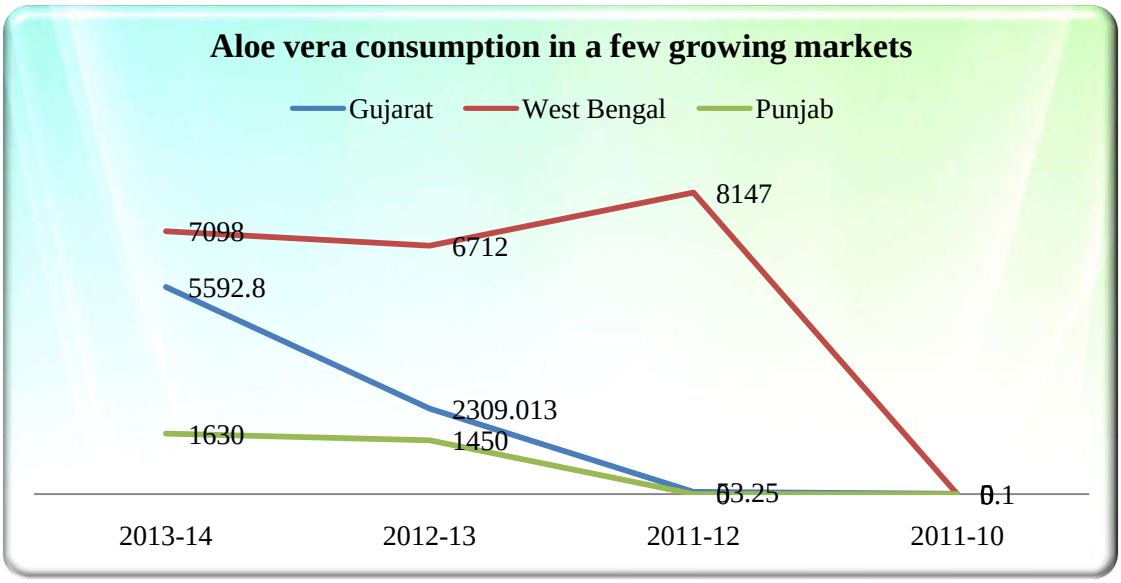


The graph highlights only two states namely Haryana and Uttarkhand. Aloe-vera finds Patanjali as a major buyer in Uttarakhand. Along with Patanjali there are numerous small-scale Aloe-vera processors found in Uttarakhand. Haryana and Uttarakhand are near Rajasthan that grows the best quality of Aloe-vera because of favourable ecology and soil type. Another reason for such small cluster of buyer is resale happening after processing. Aloe-vera can travel to greater distances after it has been processed. As a raw material, only states with close distance from the producing field can afford to purchase the raw herb. In the value chain analysis part, we will see that Aloe-vera has highest value addition after processing than most of the other herbs. Hence it will be interesting to note that the average price of aloe leaf in Uttar Pradesh is Rs.9.00/kg and in Himachal Pradesh is Rs. 4-7 /kg, whereas the national average price is Rs.16.37/kg (refer to the price analysis section). Thus, the price is much lower than average price of Aloe-vera verifying that many other states with higher price value procured in resale value of the material.

Table 19: Details of consumption by major procuring states.

S. No.	State	Consumption	% share of consumption
1	Uttar Pradesh	936987	49.09
2	Himachal Pradesh	935392	49.01
3	West Bengal	21957	1.15
4	Gujarat	7960.163	0.4
5	Punjab	3080	0.1
	Total share of consumption by top 5 states= 99.75%		

As we can see, the top two states consume 99% of the material. The rest 1 % is shared by three states namely West Bengal, Gujarat and Punjab. Uttar Pradesh and Himachal Pradesh are having mature markets as per the data sample whereas the next three states are in a growing phase. The next graph will give a pictorial representation of state with highest growing consumption.

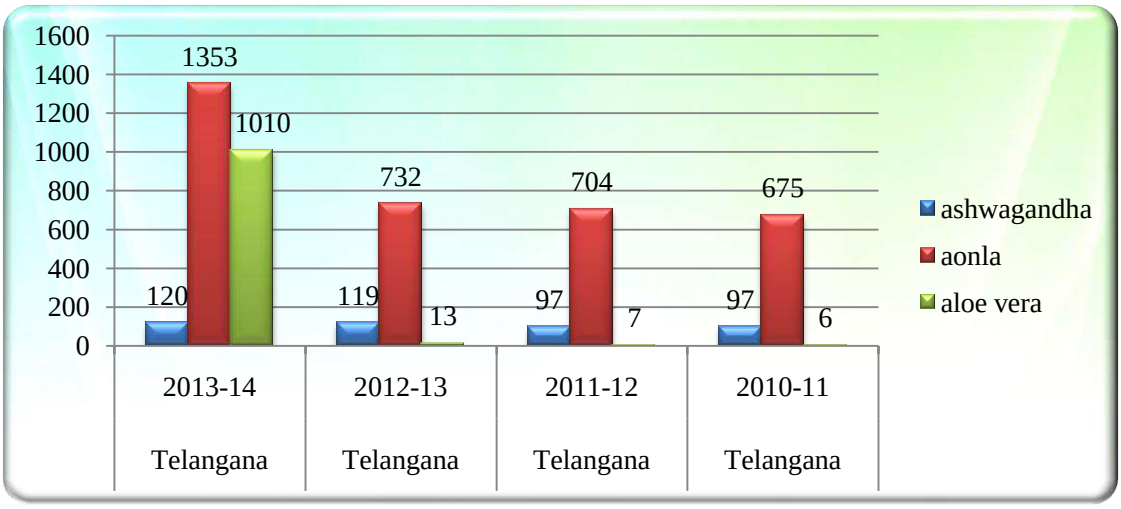


West Bengal has shown tremendous growth in recent year, Gujarat has picked up the pace after 2012 while the growth of Punjab is slow as compared to other two states. With such remarkable growth, West Bengal and Gujarat are optimistic markets for traders to expand their business.

9.4 Consumption trend in Telangana

To study the consumption of Telangana let us first look at the overall consumption scenario of the produces in Telangana. A sample set of 419 for three years have been used for this study. The total consumption of Telangana in last three years for three commodities are as follows:

2010-11	• Quantity consumed:	ashwagandha: 97	aonla: 675	aloe vera: 6
2011-12	• Quantity consumed: • Annual increment in demand in %:	ashwagandha: 97 ashwagandha: 0	aonla: 704 aonla: :4.2	aloe vera: 7 aloe vera: 1.6
2012-13	• Quantity consumed: • Annual increment in demand in %:	ashwagandha: 119 ashwagandha: 22.7	aonla: 732 aonla: 3.9	aloe vera: 13 aloe vera: 85.7
2013-14	• Quantity consumed: • Annual increment in demand in % :	ashwagandha: 120 ashwagandha: 0.8	aonla: 1353 aonla: 84.8	aloe vera: 1010 aloe vera: 7669



To understand the importance of these produces let see the growth trend of these produces individually. The graph below shows the growth trend of Aloe-vera, Ashwagandha and Aonla for the given period.

It can be seen that there has a growth in all three produces. Aloe-vera consumers show the highest growth as until 2013 the consumption was far low and it boomed suddenly in next the year. Ashwagandha on the other hand has been steady in its growth with a marginal increment after 2012. Aonla consumers reflect the best potential of consumer growth. Throughout the period, Aonla has been growing linearly at a positive graph. In last 4 years, the consumption has grown to almost 100% by quantity. 2013-14 has been a bumper growth year for Aonla as well as Aloe-vera, but Ashwagandha remained stagnant.

9.5 Telangana consumption position

To understand the state's position in the consuming trend it is important to compare its performance with other states and national averages. The table given below shows a comparison of Telangana's position to the country.

Table 20: Position of Telangana's consumption in comparison to the country

Position of Telangana's consumption in comparison to the country				
S. No	**Name of species**	**Ashwagandha**	**Aonla**	**Aloe vera**
1	% share of Telangana consumption with respect to national average	0.21	0.25	0.54
2	Telangana's rank in consumption	11	7	7

The table above shows that Telangana is in top ten lists for Aonla and aloe-vera with rank 7 but Ashwagandha has moved further to rank 11. The consumption share is less than 1% for all three produces. Although it might seem that Telangana has a higher rank than most of the states but as we have seen the major consumption is concentrated in a handful of states so to understand the real comparison it is essential to compare Telangana with top consumers of the country. In such case, the state is lagging far behind as per the given data. It is also necessary to remind that the consumption ranking here is only a reflection of the organized sector. As the herbal industry is dependent on unorganized sector the rankings may differ drastically then.

This factor will be proved when we discuss the herbal industry of south of India, we can see the huge demand scattering in the states. The validity of this ranking is to understand the movement of material in bulk quantity after which it is distributed in other parts of the country.

9.6 Demand forecasting of the produces using simple moving average technique

The present consumption trend of Ashwagandha, Aloe-vera and Aonla is shown in the above pages using data of 175 organizations, which is an appropriate representation of the consumption in the country.

The same data is being used to predict the future consumption trend till the year 2022-23. The technique used here is simple moving average technique using time series data. The forecasting results will be suited in case of present trend growth and similar external environment.

The simple moving average technique forecast is based on average past demand. The idea here is to simply calculate the average demand over most recent periods. Each time a new forecast is made the oldest demand is discarded in the average and the newest period is included.

The formula for simple moving average is

$F_t = (A_{t-1} + A_{t-2} + A_{t-3} + \ldots\ldots\ldots\ldots\ldots\ldots A_{t-n})/ n$

Where

F_t = forecast for the coming period.

n = number of periods to be averaged

A_{t-1} = actual occurrence in the past

A_{t-2}, A_{t-3} …… and A_{t-n} = actual occurrences two periods ago, three periods ago, and so on, up to n periods ago.

The forecasting is, firstly done for the country wise consumption and then narrowed down to see the future consumption of Telangana.

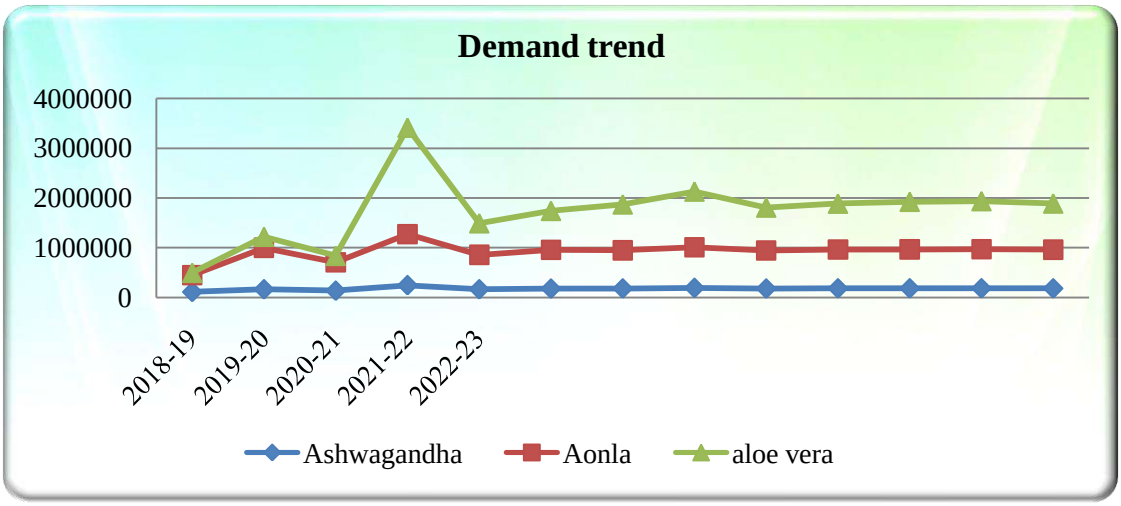
Table 21: Showing the prediction of Ashwagandha, Aonla and Aloe-vera in the country.

Forecast of demand of India till 2022-23(kg)			
Year	**Ashwagandha**	**Aonla**	**Aloe-vera**
2018-19	180674.9663	761842.213	865482.8
2019-20	184280.7427	779791.914	922813.3
2020-21	185481.2757	780162.181	957779.6
2021-22	186135.5825	783935.753	966565.2
2022-23	184143.1418	776433.015	928160.2

The above data is derived using the data from the year 2011 to 2015. The first column shows the growth in consumption of Ashwagandha. Ashwagandha initially grows only 2% and the next year in 2020-21 it grows to 6.5. The year later the growth slows down again and in 2022-23 it reflects a negative growth of -1.07%. The next column deals with Aonla consumption from 2018-19 to 2022-23. The growth of Aonla is very stable as in the first year it grows only 2.3% and the next two consecutive years the growth remains only 0.04% the last year Aonla consumption dips to -0.9%.

Aloe-vera is the third interest of produce and in the first year the growth jumps to 6.6% the following year it still maintains a decent growth of 3.7%. The growth starts dipping at a rate of 0.9% and finally reaches a negative growth of -3.9%.

Now let us see how the growth trend line will appear for the three produces.



The above chart shows that the Ashwagandha consumption remains almost stable throughout the period. At the same time its quantity of consumption least among the three produces. Aonla on the other hand shows a minor growth in recent years ahead but then its consumption becomes stagnant. Both Ashwagandha and Aonla run parallel in the growth trend signifying similar growth pattern. Aloe-vera has shown a very optimistic growth trend. It should be noted that the slope of each of the three lines are same signifying the similar nature of growth of all medicinal plants irrespective of individual demands.

9.7 Demand forecast of consumption in Telangana

This is the last part of studying the consumption trend and it deals with the consumption trend that Telangana might have in future. The same data is being used to predict Telangana's consumption as it was used in predicting overall country's consumption. Let us now see how Telangana's consumption will grow till 2022-23.

Table 22: Position of Telangana's consumption in comparison to the country

Forecast of demand of Telangana till 2022-23 (kg)			
Year	**Ashwagandha**	**Aonla**	**Aloe-vera**
2018-19	111.7188	942.668	370.0977
2019-20	112.6484	961.835	397.8721
2020-21	113.0605	973.8562	416.7776
2021-22	112.7007	975.7734	420.7064
2022-23	112.5321	963.5331	401.3634

The first column in the table shows the growth trend of Ashwagandha from 2018-19 to 2022-23. The growth of Ashwagandha has been extremely weak with less than 1%. A similar trend is seen in both aonla and aloe-vera. This kind of trend is a reflection that in the recent years there has been no significant step taken to increase the consumption of these produces in the state. The market of medicinal plant is still at a very nascent stage in Telangana and it requires better policy and infrastructure in the state to improve the prevailing condition. As moving averages consider past data to predict the future demands, it can be said that this scenario is possible to shift to a better growth trend if necessary actions are taken.

CHAPTER 10

EXPORT POTENTIAL OF INDIA IN MEDICINAL PLANT MARKET

The international trade centre has developed a methodology to assess the export potential for developing nations. The idea is to use the trade market information to measure two indicators namely:

1. Export potential indicator
2. Product diversification indicator

The **Export Potential Indicator** is the permutation of a supply scenario of a product in a market of a country, easiness of export and demand of the same product in a market of a country.

Supply: The supply side is based on a dynamic version of market share, corrected for some of the factors that distort the measure of true export performance. The first factor considered is projected ratio of expected GDP over current GDP to account for the fact that economic growth will augment the exporter's capacity to export. The second factor is the export-import ratio. Declared exports often comprise re-exports that are not linked to any capacity of the country to produce the good. The last factor represents the margin of preference the country globally faces when exporting product. The market share of a country in exporting certain goods as captured by trade data encompasses information on tariff advantages. It is likely to be larger when the country has large tariff advantages in world markets for some product. This does not mean, however, that the product represents an export opportunity also in a given target market (or region) if that particular target market offers less favourable market access conditions. The opposite is true for global tariff disadvantages: even though the product is of little importance to the country overall, it could have a high potential in a specific target market.

- **Demand**: Demand conditions are captured through the combination of a projection of import values and of factors accounting for the openness of the

target market to the products exported by the country. Projected import is based on current imports, augmented by expected population growth (with a unitary elasticity) and expected growth of GDP per capita.

- Demand for all goods increases because of population growth, but demand for superior goods increases more when GDP per capita is expected to grow.
- **Easiness to trade**: Easiness is based on actual trade between exporter and market for products with potential relative to their hypothetical trade if exporter had the same share in market as it has in world markets.

10.1 Product Diversification Indicator

The EPI results from a mathematical decomposition of potential export values into a measure of market share, easiness and demand. Market shares can only be computed for existing products. To identify diversification opportunities, linkages from a country's current comparative advantages to potential new ones are established making use of the product space concept.

The top potential markets for India in medicinal plant export potential are USA, China, Germany and Malaysia. The table given below is a list of top exporters of India's preferred nations of export in descending order of ranking.

Table-23: Top exporters of India's preferred nations of export in descending order of ranking.

				In US $
USA	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	206.4 mn	45 mn	161.4 mn
	India	61.7 mn	76.4 mn	-
	Egypt	21.9 mn	21.4 mn	21.1 mn
	Chile	15.6 mn	3 mn	12.6 mn
China	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	India	55.8 mn	6.8 mn	49 mn
	Indonesia	16 mn	2.8 mn	13.2 mn
	Germany	13.7 mn	2.4 mn	11.4 mn
	Kazakhstan	7.9 mn	17.8 mn	-

Germany	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	112.6 mn	12.8 mn	99.8 mn
	India	49.2 mn	23.2 mn	26 mn
	Egypt	23.6 mn	24.6 mn	-
Malaysia	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	77.9 mn	47.4 mn	30.5 mn
	India	30.1 mn	3.4 mn	26.7 mn
	Indonesia	3.3 mn	502.1 k	2.8 mn
	Egypt	1.6 mn	226.32 k	1.4 mn
Hong Kong	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	262.9 mn	217.6 mn	45.3 mn
	India	18.4 mn	786.6 k	17.6 mn
	Indonesia	2.8 mn	2 mn	812.2 k
	Thailand	2.5 mn	1.7 mn	851.8 k
Singapore	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	43.1 mn	29.2 mn	13.9 mn
	India	18.3 mn	1.6 mn	16.8 mn
	Indonesia	13.4 mn	24 mn	-
	Thailand	3.3 mn	1.2 mn	2.0 mn
Vietnam	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	262.9 mn	217.6 mn	45.3 mn
	India	18.4 mn	786.6 k	17.6 mn
	Indonesia	2.8 mn	2 mn	812.2k
	Thailand	2.5 mn	1.7 mn	851.8 k
UAE	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	India	17.7 mn	7.5 mn	10.2 mn
	China	15.1 mn	590.7k	14.5 mn
	Egypt	7.3 mn	660.8 k	6.6 mn
	Germany	1.4 mn	437.8k	1.0 mn

UK	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	30.3 mn	4.4 mn	25.9 mn
	India	16.6 mn	5.3 mn	11.4 mn
	Egypt	9.3 mn	2.1 mn	7.3 mn
	Poland	3.6 mn	868.2 k	2.7 mn
France	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	33.4 mn	9.4 mn	24 mn
	India	14.8 mn	5.2 mn	9.6 mn
	Morocco	14.2 mn	9.2 mn	5 mn
	Egypt	12.3 mn	2.2 mn	10.1 mn
Netherland	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	27 mn	9.9 mn	17.1 mn
	India	10.7 mn	1.2 mn	9.5 mn
	Egypt	3.7 mn	2.4 mn	1.3 mn
	Poland	3 mn	709.4 mn	2.3 mn
Canada	**Exporting country**	**Export potential**	**Actual export**	**Untapped potential**
	China	40.9 mn	11.8 mn	29.1 mn
	India	10.6 mn	2.7 mn	7.9 mn
	Mexico	3 mn	4.5 mn	-
	Germany	2.5 mn	3 mn	-

The above table has listed the countries where India finds highest potential market for medicinal plants and herbs. From the given table we will now churn out the more untapped market and current ranking of export for that market to understand where India can base its export for herbal material in future. The next table will comprise of the percentage of untapped market in India's preferred export destination along with the export ranking for our country.

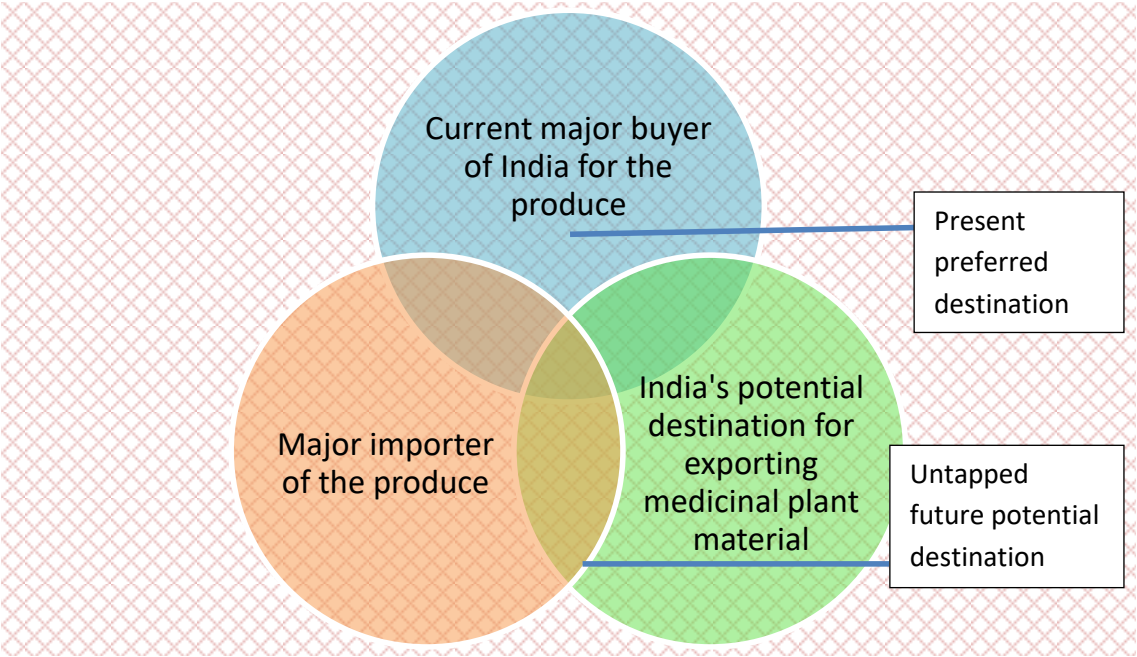
Table-24: Reference table for finding product wise potential destination for India

Reference table for finding product wise potential destination for India		
Name of destination market (in order of descending ranking of best potential nations)	**Current ranking of India in export of medicinal herbs**	**Untapped potential in the destination**
USA	2	-
China	1	87.8%
Germany	2	52.8%
Malaysia	2	88.7%
Hong Kong	2	95.6%
Singapore	2	91.8%
Vietnam	2	95.6%
UAE	1	57.6%
UK	2	68.67%
France	2	64.86%
Netherlands	2	88.7%
Canada	2	74.5%

- India has the best trading deals with USA but way below than China as the later has the highest supplies in this country.
- The most untapped nations are Vietnam, Hong Kong, Malaysia and Singapore.
- In addition, India has a vast untapped potential in China. However, China is the biggest competitor to India in the sector, so there is a high threat of reselling of the produce through Chinese corridors.
- More than 70% market is still untapped in top 12 nations for India.

The next part of this section will analyse the potential destinations for Ashwagandha, Aloe-vera and Aonla with the help of the above reference table.

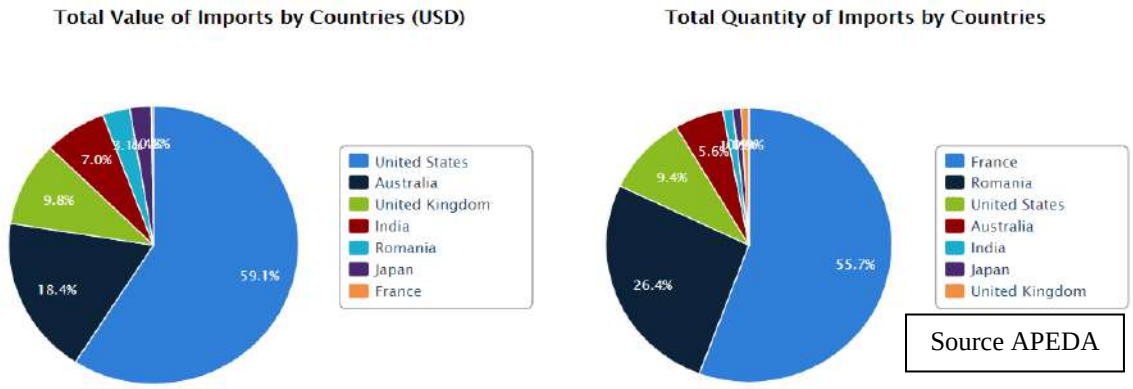
The vein diagram given below is a pictorial representation of how potential destinations will be predicted for present and future timeline.



10.2 Ashwagandha potential destinations

Ashwagandha is exported as powder and dried roots in several countries. The potential destinations for Ashwagandha are carried out in three major steps as below:

Step 1: The top importing countries of Ashwagandha is given below:

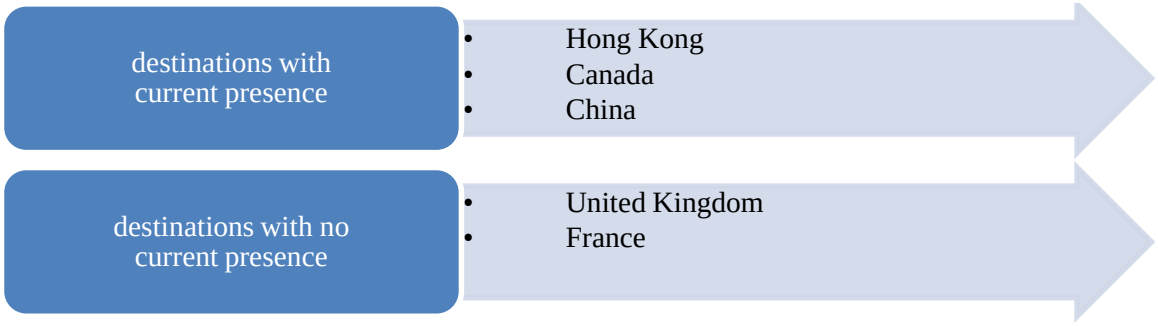


From the above pie chart, we find that value wise United States of America is the highest importer with 59% share followed by Australia and UK with 18% and 9% respectively. India is the fourth biggest importer of Ashwagandha in the world. However from the quantity wise the France is the highest importer with 55.7% share followed by the Romania with 26.4% share and United States with 9.4% share.

Step 2: The major buyers of Ashwagandha from India are as follows:

S. No.	Name of buying nation	Share of exporting Ashwagandha
1	USA	52.44%
2	Hong Kong	34.45%
3	Indonesia	4.68%
4	Canada	1.24%
5	China	1.3%

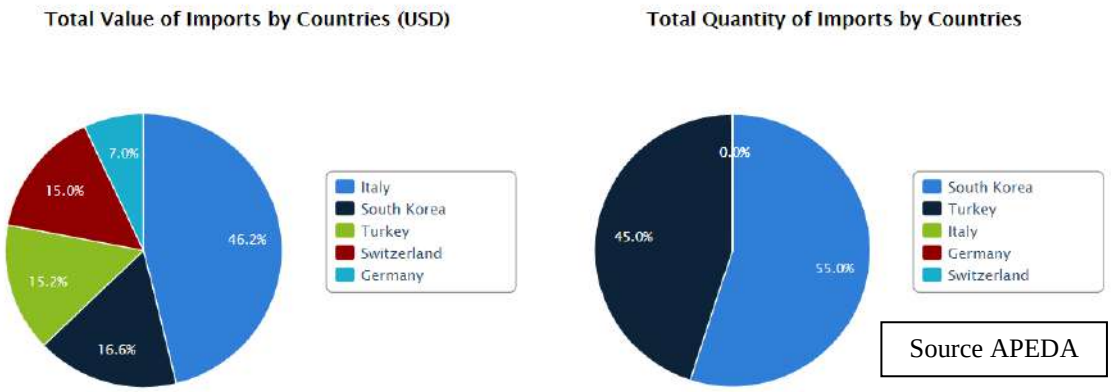
Step 3: Aligning data of reference table, step-1 and step- 2 we derive to the following results:



10.3 Aonla potential destinations

Aonla is the most versatile herbal produce. Due to its vast applications it has established itself as a potential ingredient in cosmetic and drug industry. Aonla is exported from India in dry as well as fresh form.

Step 1: The major importing countries of Aonla are:

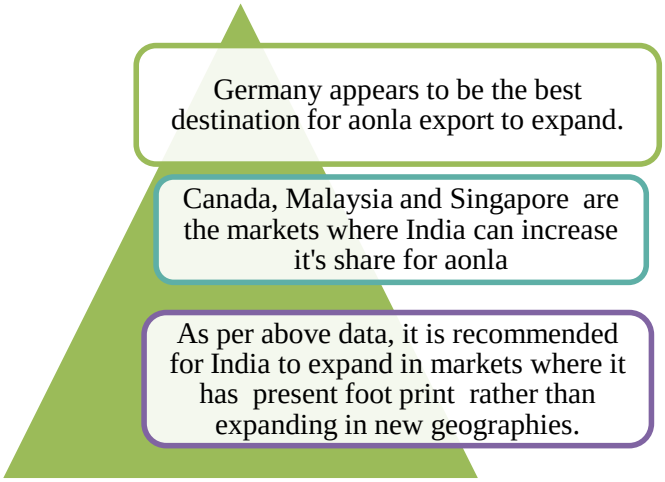


Source APEDA

Step 2: The major buyers of Aonla from India are:

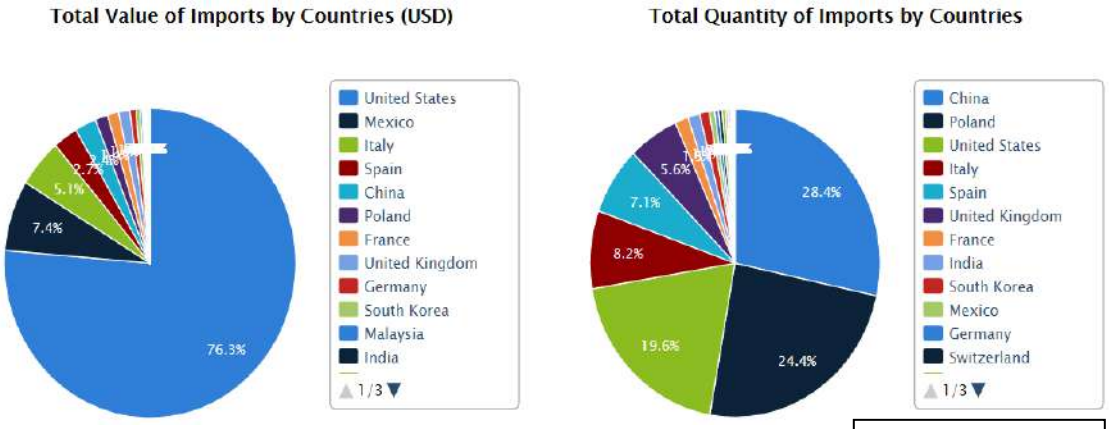
S. No.	Name of buying nation	Share % age of exporting Aonla
1	USA	97.3%
2	Japan	1.87 %
3	South Africa	0.17%
4	Nepal	0.14 %
5	Canada	0.13%
6	Singapore	0.1%
7	Malaysia	0.09%

Step 3: Aligning data of reference table, step-1 and step- 2 we derive to the following results:



10.4 Aloe-vera potential destinations

Step 1: The major importers of Aloe-vera are:



Source APEDA

Step 2: The major buyers of aloe-vera are

S. No.	Name of buying nation	Share of exporting Aloe-vera
1	Nigeria	31.6%
2	Turkey	10.7%
3	UAE	7.3%
4	USA	5.8%
5	Sri lanka	4.0%
6	Iran	3.7%
7	Mozambique	3.5%

Step 3: Aligning data of reference table, step1 and step 2 we derive to the following results

It has been observed from two previous steps that USA is the only country that is a major buyer of aloe-vera and at the same time one of the major buyers from India. But as it is mentioned in the reference table India has full potential to export medicinal plant material in USA. Thus, currently the destination where India is exporting is not in the top 10 buyers list of Aloe-vera.

The potential destinations of Aloe-vera are China, Germany and France.

10.5 Export and import scenario in India for the produces

The first part of this section dealt with the potential destinations of the country. This section gives an insight of the value and quantity of export as well as import happening from India. The first table shows the scenario of Aloe-vera.

Table 25: Aloe-vera export-import scenario in India

Aloe-vera export import scenario in India				
S. No.	**Transaction type**	**Quantity (kg)**	**Value ($)**	**Average price per unit ($)**
1	**Export**	19929532	8135980	0.41
2	**Import**	1836407	13046615	7.1
3	**Difference**	18093125	-4910635	-6.69

The above table reflects that Aloe-vera by quantity has a positive export-import difference but by value import is above export by 60%. Also the average price per unit received in export is less than the import price paid by India.

This is a clear indication that India's produce is unable to meet the industry demands and that is why it is bringing in high valued produce. The main reason can be lack of quality material required in the drug and food industry.

The next produce of interest is Aonla. Let us see the international trade of Aonla with respect to India under HS code 73069090.

Table 26: Aonla export-import scenario in India

Aonla export import scenario in India				
S. No.	**Transaction type**	**Quantity (kg)**	**Value ($)**	**Average price per unit ($)**
1	**Export**	3395	50666	14.93
2	**Import**	9823	454904	46.31
3	**Difference**	-6428	-404238	-31.38

The scenario of Aonla shows a negative export import ratio at all three parameters. The import to export ratio for quantity is 2.8 and by value, it is 9.06. Thus even Aonla of higher value is procured from outside the border. The difference in average price also indicates the same result.

Next, let us see the kind of results showed by Ashwagandha to have a better understanding of the export trend and underlying reasons for it.

The below will show the data of export scenario of Ashwagandha under HS code 21069099

Table 27: Ashwagandha export import scenario in India

Ashwagandha export import scenario in India				
S. No.	**Transaction type**	**Quantity (kg)**	**Value ($)**	**Average price per unit ($)**
1	**Export**	3656025	16016602	4.38
2	**Import**	9002	77951	8.66
3	**Difference**	3647023	15938651	-4.2

Ashwagandha has shown a very optimistic result in the export market both in value and quantity. Even after having a good negative margin in per unit price it has able to create a favourable scenario due to heavy export quantity compared to its import quantity.

One inference we can make from this chapter is that high perishable items like Aonla and Aloe-vera is largely dependent on import material. This can be caused due to improper and poor manufacturing infrastructure in the country. The infrastructure units not only need to be technically upgraded but at the same time it should have the necessary certifications required for exporting to overcome the sanitary and TBT issues. When we talk of certifications, we also include the production farms of the raw produces. The importance of this will be highlighted more visibly in the case study of "KSM-66, ashwagandha export".

Another reason supporting importance of quality issue prevailing in the material produces in India is the striking price difference between export and import of the produces. The domestic manufacturers are ready to buy at a higher price but due to lack of desired material they purchase from outsiders.

CHAPTER 11

IMPORTANCE OF HERBAL INDUSTRY IN SOUTH INDIA: A CASE STUDY FOR UNDERVALUED POTENTIAL MARKET OF TELANGANA

The natural sources of medicine are deeply rooted in the south Indian states from ancient times. Recently, many FMCG giants are trying to capture the southern market, which is the biggest naturopathy market in the country. Hindustan Unilever Limited has considered launching in south considering the consumer preference of that geography sticks to Ayurvedic products. In February, 2017, Lever Ayush launched itself in 5 south Indian states. It has leveraged the acquisition of Indulekha to transform it from a distinctly Kerala entity into a national brand. The company will offer 20 Lever Ayush products for as low as Rs. 30 across the 5 states in south of India. There are more than 15 Ayurvedic brands in southern states, the prominent being Dhathri Ayurveda, Sakunthala, Pankajasthuri, Heena and Siso. According to a research conducted by Nielsen market research the natural products contribute 41% to the Rs. 45,000 crore personal care market. Maximum demand comes from Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, Maharashtra, Madhya Pradesh, Telangana and Punjab.

In Kerala, more than 60% population is dependent on naturopathy for healing purposes. By the year 2017, Kerala had 350 crore market by value for natural

medicines. Out of this 75% belongs to the organized sector, marking as one of the highest organised landscape in organised Ayurvedic industry in India. As a result, Kerala took no time to become the hub for medical tourism particularly in Ayurvedic and naturopathy sector. From unorganized massage parlours to established medical houses Kerala is flooded with institutes offering a range of healing packages for its tourists around the world at a cost of 1/10 incurred in developed countries.

Other south Indian states like Tamil Nadu, Karnataka and Andhra Pradesh too have shown similar growth in this sector. The following pages will take through the herbal market analysis of these parts of the country that has the highest domestic demand for herbal produces.

11.1 Area of study

Out of 5 states in south India Tamil Nadu, Karnataka and Kerala is chosen for the study for its market size and high demand. As mentioned, there is a lack of regulation in the market and hence the concerned department on time does not update data. This study is based on primary data provided by manufacturers and traders along with some data provided by governmental departments.

11.2 Karnataka

Karnataka is situated in southwest India with Arabian Sea to its west. The capital city is Bangaluru known for high tech industries, shopping malls and nightlife. Nevertheless, amidst the juggling uptown there is a huge market for herbal industries. Companies like Lotus, Himalaya, Sainilabs and Natural Remedies are based in this state.

Procurement of produces

According to traders at Ayurpark, Bangalore, 70 -80 % of the herbal material comes from other states to Bangalore and other districts of Karnataka. This is mainly because there is no bulk cultivation of herbal produce in Karnataka. The farmers in Karnataka prefer cash crop over herbal produces due to lack of available market and price. The table given below shows the source of procurement and approximate quantity of produce.

Table 28: Source of procurement and approximate quantity of produce

S. No.	Name of produce	Source of procurement	Consumption of Karnataka in 2014-15 to 2015-16 in kg (ABS data)	Quantity procured from other states (approx. value in kg)
1	Ashwagandha	Karnataka, Tamil Nadu, Chhattisgarh	54376	38063
2	Aonla	Pratapgarh, Karnataka	829596	622197
3	Aloe-vera	Maharashtra (Nasik, Aurangabad)	168257	131240

The growth rate of herbal sector of Karnataka compared to national average growth is as follows:

Table 29: The growth rate of herbal sector of Karnataka compared to national average growth

S. No.	Annual growth of herbal market in India	Annual growth of herbal market in Karnataka
1	7% (source: Exim data report)	12-15% (reported by manufacturers through FGD)

The above table reflects that Karnataka is growing faster than the country reflecting. Thus, it can be estimated that Karnataka has an untapped potential in the sector and is in growing phase at present.

Gap existing in the market

The gaps in the existing market are discussed among 10 traders in a focus group discussion in Bangalore. The members are prioritizing the following issues:

- Lack of primary processing of the material
- Lack of clean material
- Lack of dedicated council and illegal trading
- High corruption in getting license
- Low clinical research in the sector

11.3 Tamil Nadu

Tamil Nadu is the southernmost state of India and commercial capital of south Indian region. Its contribution to national GDP ranks number 4. The capital of Tamil Nadu is Chennai, which is also an "A+" grade herbal trading hub of the country. Many southern states procure herbal raw material from there but it is interesting to know if the market possess own production or resale the produces brought from Northern states.

The biggest drawback is the absence of access benefit sharing (ABS) data that is generally provided by the biodiversity board marking the total consumption in the state. As a result, it is not possible to get the market size of the produces of interest but the demand can be studied through analysing the home production and data provided by organizations in last 3 years.

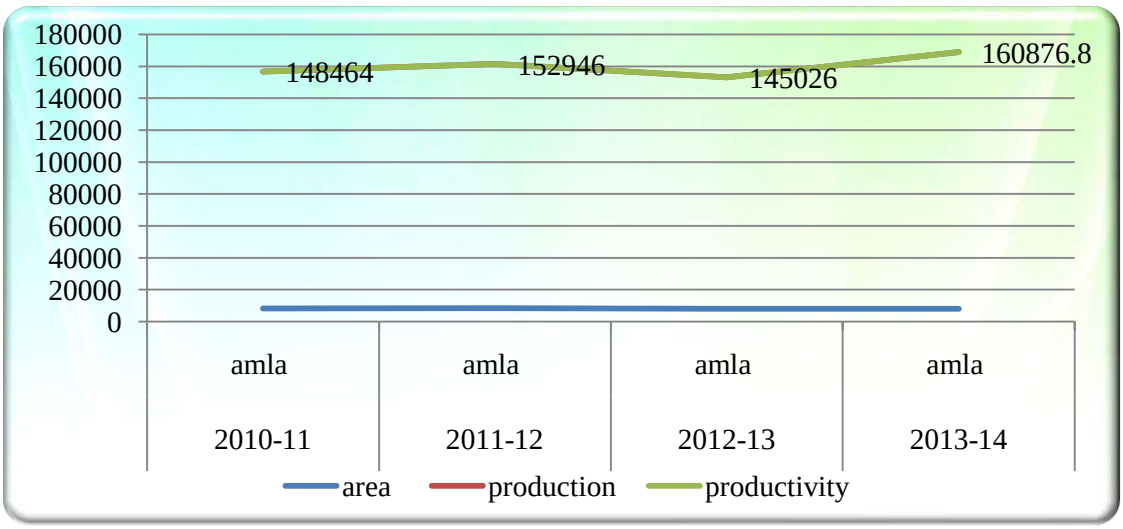
The production scenario of Tamil Nadu from 2012-13 to 2014-15 is as follows:

Table 30: Area, production and productivity in Tamil Nadu

	Area, production and productivity in Tamil Nadu								
	2012-13			**2013-14**			**2014-15**		
Crop	**area**	**Production**	**Productivity**	**area**	**Production**	**Productivity**	**Area**	**Production**	**Productivity**
Aloe-vera	46	1840	40	51	2284.8	44.8	55.37	2480.62	44.8
Aonla	8057	145026	18	7980	160876.8	20.16	7665.09	154528.27	20.16

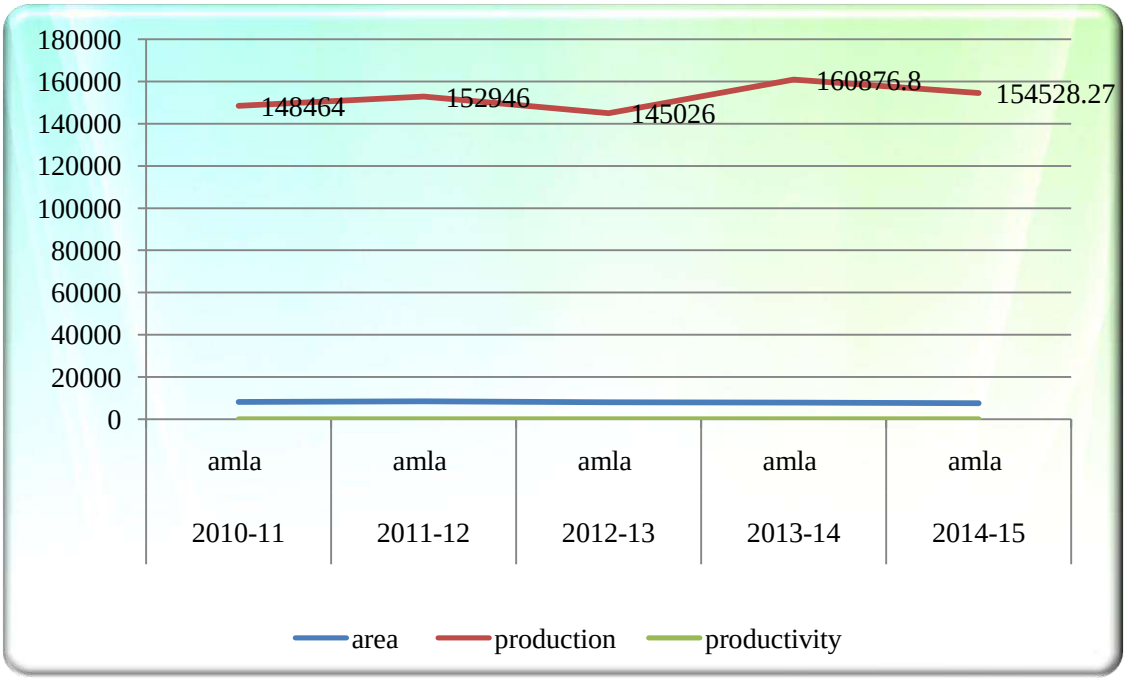
Source: Horticulture Department, Chennai

The trend of Aloe-vera production from 2010-11 to 2014-15 is given as:



It can be seen that production has increased marginally in 5 years with no significant increase in productivity and area. Thus, it can be estimated that with increase in demand and stagnation in production the procurement is dependent on import from other states.

The trend of Aonla production from 2010-11 to 2014-15 is given as:



The above graph depicts that productivity of cultivated Aonla is extremely low. In addition, the production remains almost same in last 5 years.

Now it should be noted that the demand for Aonla is satisfied by wild collection along with cultivated production. According to Forest Department, Chennai, NTFP collection is completely banned in the state due to forest restoration and collectors are employed as guards against poaching in the forest area. There is no recorded production data of ashwagandha is available in the state.

Demand scenario in Tamil Nadu

In the last segment, we saw a stagnated production scenario. This segment will test from a sample of organizations across the state whether demand is also stationary like the production or there is a substantial import happening in the state.

The graphical representation below is derived from consumption data of 12 companies during 2011 to 2014.

Please note that the graph starts from 2013-14 to 2010-11. The graph shows high growth in demand in Ashwagandha and Aonla. On the other hand, Aloe-vera has grown marginally.

The conclusions that can be drawn here are as:

1. The demand surpasses production immensely thus Tamil Nadu herbal market is highly dependent on import from other states.
2. As many southern states are procuring from Chennai market and a substantial export is going through its ports, it can be predicted that Tamil Nadu resale raw herbs after importing from other states.
3. The demand of Ashwagandha and Aonla is growing very rapidly year after year.
4. As Tamil Nadu has a large forest cover and earlier a substantial amount of Aonla and other herbs were procured as NTFP, the state has faced a jolt in home grown production after NTFP collection is banned by the government.

11.4 Kerala

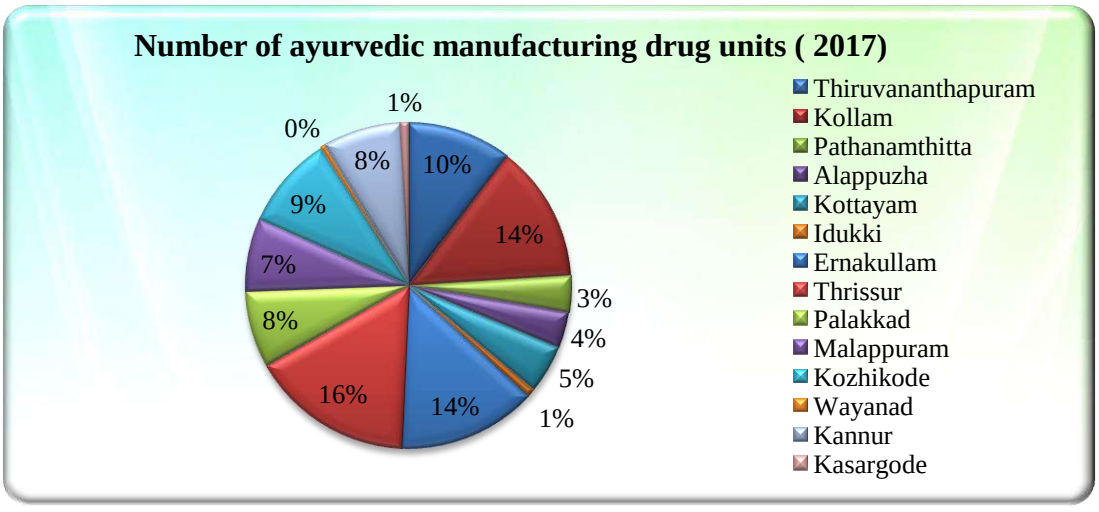
The growth of Ayurvedic industry is not hidden from any part of the world. The state is filled with small scale and micro industries selling natural cosmetic and medicines at a very low cost. One of the reasons to such tremendous growth owes to the emphasis on medical infrastructure by the state government.

The structure of the herbal medical market is monopolistic in nature. There are large manufacturers, small manufacturers and an unorganized sector. The large-scale manufacturers operate throughout the year at international and national levels. They have well-structured research and development laboratories and impart large-scale production. The small-scale industries are area specific. They produce a few specialized drugs seasonally but have a good capture in the area. The unorganized sector consists of mainly folklore healers with high indigenous knowledge protectors. These practitioners have been operating in generations and have loyal customers. Most of the herbs required by them is procured locally and processing is very simple with basic infrastructure. As mentioned before, there is a large section of this industry under unorganised sector and it is beyond the scope of this document. The list below is an updated data on the district wise number of manufacturing units in organised sector.

Table 31: District wise number of manufacturing units in organised sector

S.No.	Name of district	Number of ayurvedic manufacturing drug units (2017)
1	Thiruvananthapuram	93
2	Kollam	122
3	Pathanamthitta	32
4	Alappuzha	32
5	Kottayam	43
6	Idukki	8
7	Ernakullam	124
8	Thrissur	144
9	Palakkad	68
10	Malappuram	65
11	Kozhikode	83
12	Wayanad	5
13	Kannur	69
14	Kasargode	7
Total		**895**
Source: DC Control Office, Thiruvananthapuram, Kerala		

There are 895 registered ayurvedic units spread across the districts of Kerala. Now let us see which districts in Kerala have highest clusters of units and can have higher potential of consumption of herbal produce.



The pie chart above, shows Thrissur has the biggest potential followed by **Kollam** and Ernakulum. Around 50% of the Ayurvedic market is concealed in only 3 districts.

If we compare the data of 2017 and 2001, it can be verified that the number of units working in this area did not change drastically. The expansion of market happened in terms of escalating in business and unorganised units mushrooming in every lane with attractive new products.

Consumption of raw material

The home-grown production of Kerala only satiates the micro healers and a few small-scale industries. The large-scale industry on the other hand depends on bulk procurement with accountability of quality and time. Hence, they reach out to distributors across the country for raw material. To understand the system of procurement more closely a public sector enterprise "Oushadhi" based in Thrissur district is studied and the output of analysis is as follows:

Oushadhi Manufacturing Unit in Thrissur

Generally, procurement is done biannually by the organization. The first batch arrives between April-September and second between Octobers-March. The rationale for multiple procurement is to avert risk and keep low storage cost. E-tenders are invited for new procurement.

Table 32: Procurement details of "Oushadhi"

Procurement details of " Oushadhi "				
Name produce	**Average procurement in last 3 years (kg)**	**Average price in last 3 years(Rs/Kg)**	**Average annual growth %**	**Source of procurement**
Aonla dry	57300	60.22	15-20%	Uttar Pradesh & Madhya Pradesh
Aonla fresh	40600	19	10-15%	Local traders of Kerala
Aloe-vera	95000	4.34	Stagnant	Local traders
Ashwagandha	48666	202.78	10%	80% from Neemuch

The major conclusions that can be drawn from the above case are:

1. The herbal market of Kerala is still expanding even in the organized sector.
2. Most of the procurement is done through north Indian states.
3. The dependence on import raw material and ever-growing landscape makes Kerala a favourable destination for herbal traders.
4. Aloe-vera is purchased in raw form by large units. The requirement of processed Aloe-vera is in small-scale sector.
5. Perishable items like fresh Aonla and Aloe-vera is brought locally

11.5 Telangana's competitive advantage in the southern herbal market

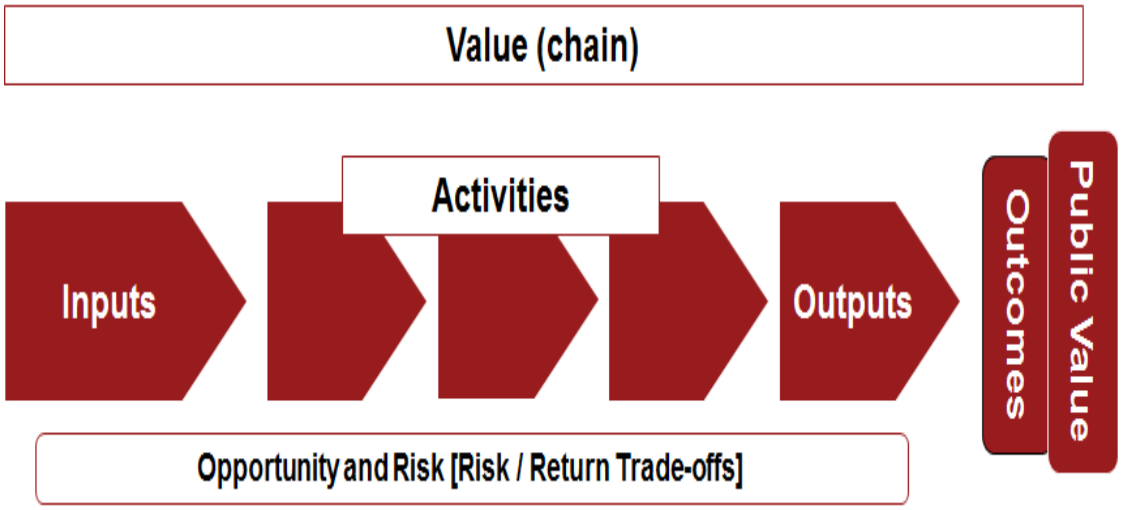
1. **Cultural similarity:** The role of culture in any business intervention is imperative as it involves mutual understanding of needs, taste, ethics and traditions. Even business giants like Disney failed in Paris due to lack of cultural similarity. As Telangana and other 4 states of south share many cultural resemblances the formal can definitely get an edge over other states. This factor has a higher influence in the unorganized sector where small traders and manufacturers have flooded the market and prefer to collaborate with people of likable thinking, business ethics and ethos. Also more than often, a major

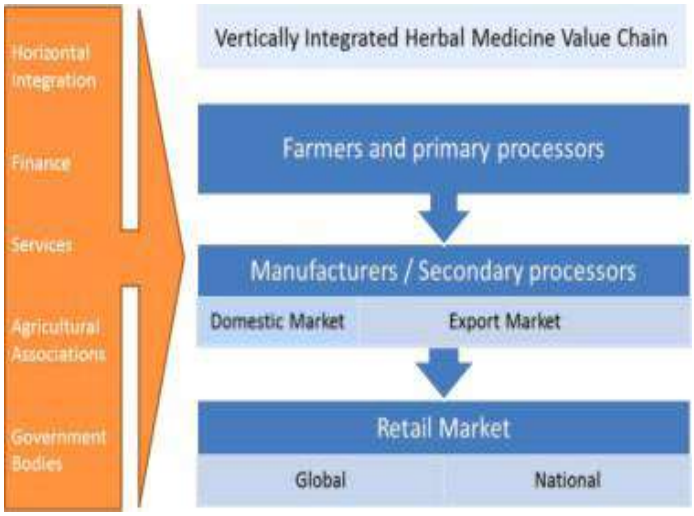
section of population there are multilingual for languages spoken in the south but struggle in north Indian language.

2. **Distance from the target market:** This is one of the most important advantages **for** Telangana as most of the bulk procurements happen from distant states of Uttar Pradesh, Delhi and Madhya Pradesh. However, this advantage can be counted only if Telangana manages to provide bulk and good graded material. In such scenario, the south Indian states will have an accessible market for raw materials in the vicinity. This is a great opportunity for the farmers as many a times they go until North to get a good price for their material. Further, the freight charges of the raw material will be decreased drastically. This even creates a new prospect of growth for fresh Aonla and other highly perishable items.
3. **Favourable geography:** Telangana has the potential to grow Aonla, Aloe vera and Ashwagandha in many regions due to its semi-arid conditions. The state is yet to tap full potential of cultivation.
4. **Ease of networking:** Many factors contribute to easiness in networking and distributing in southern states for Telangana. Most large units reach out to the distributors and agents for material. In every value chain the efficiency is increased with better networking. The above three factors ultimately results in providing a better chance of networking for the concerned state. Even industry giants like Dabur approach their trusted dealers year after year for material procurement.
5. **Lack of regular herbal market in south India:** The biggest scope for Telangana in entering the south market is curbing the irregular procurement setup. Currently there are few clusters of herbal market but until now, the dependence of procurement is on Neemuch, Pratapgarh and other north Indian markets.

CHAPTER 12

CONCEPT OF VALUE CHAIN ANALYSIS



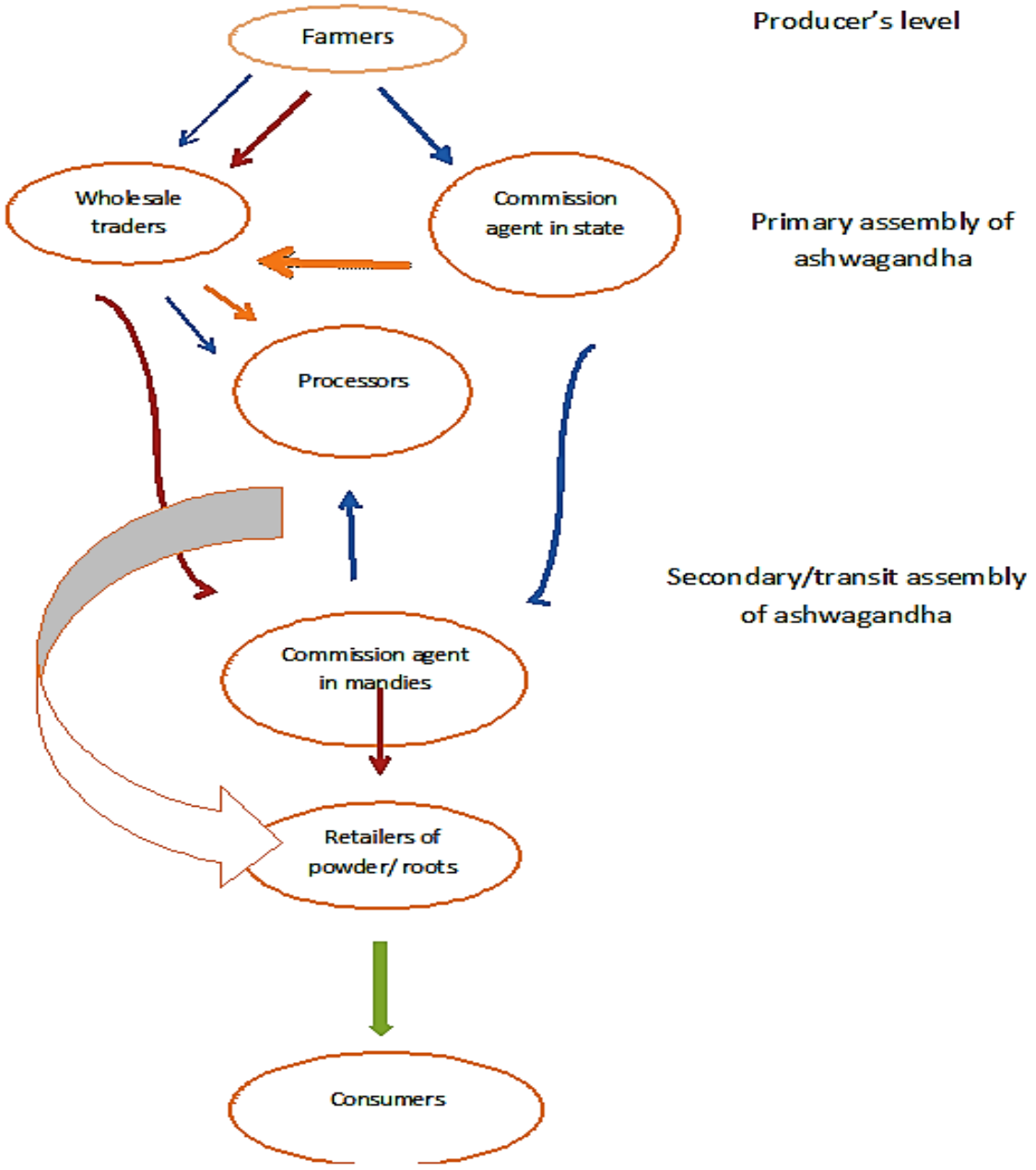


Value chain analysis is the process of breaking a chain into its constituent parts in order to better understand its structure and functioning. The analysis consists of identifying chain actors at each stage and discerning their functions and relationships; determining the chain governance, or leadership, to facilitate chain formation and strengthening; and identifying value adding activities in the chain and assigning costs and added value to each of those activities.

Herbal-value chains encompass activities that take place at various levels (farm, rural and urban), starting with input supply and continuing through product handling, processing, distribution and recycling. As products move successively through the various stages, transactions take place between multiple chain actors, money and information are exchanged and value is progressively added.

12.1 Different Ashwagandha supply-chains in Telangana

There are many supply channels of Ashwagandha existing in the state. Some important channels are as follows:

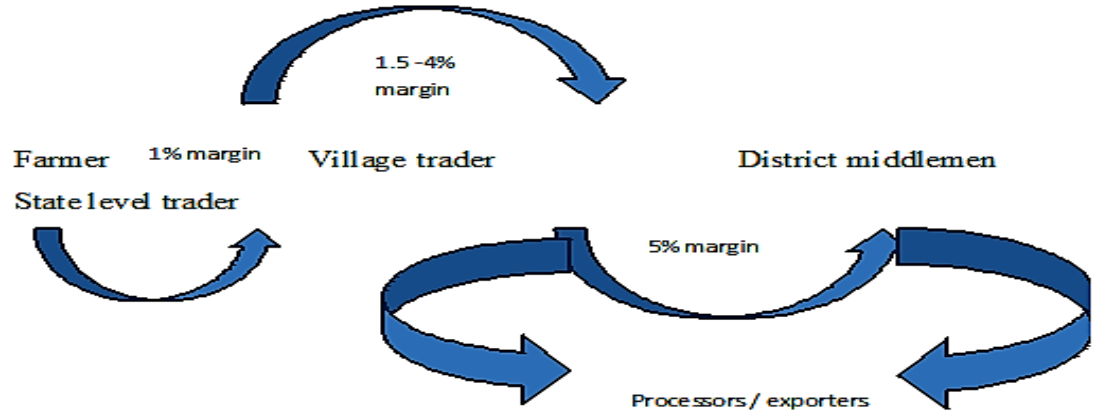


The above flow chart depicts the different value chains of Ashwagandha prevalent in Telangana. Three types of value chains are projected are as follows:

1. **Farmer – wholesale trader- processor- retailer- consumer**
2. **Farmer- wholesale trader- commission agents at mandies- processor- retailer-consumer**
3. **Farmer- local commission agent - commission agents at mandi- processor- retailer – consumer**

According to major traders, it has been found that 60% of the material that comes in the Mandies is procured by the intermediaries who resale it further. In addition, the middle men collects Ashwagandha from farmers' gate, village traders, village market (shandi) and resale it further. There are many levels of mediators and they have different sources of procurement and different customers:

- **Local village traders**: These village traders buy directly from the farms and bring them to district head from different blocks of the district. They sell the material in district shandi or contact district level or state level traders directly. They generally keep a margin of 1% of cost price for themselves.
- **District middlemen**: These middlemen either purchases from farmers or from village traders depending on the distance and cost they incur in both options of procurement. The district level middlemen further sale to players of higher stage in the supply chain.
- **State level traders**: These traders receive material from a number of sources who can give the material at their door step. Around 15 % of these traders fetch material from regular markets outside the state.



The above flow chart shows an average margin drawn by each stakeholder in different value chains. As the value chain length increases the margin gets dropped to a lower value which also depends on the supply & demand of material during that time. It can be clearly seen that the farmers draw the least margin and due to presence of the middlemen there is an increase in price of about 9% without any substantial value addition in the product.

The next part of this section will give a clearer view of value distribution by analysing the price spread in detail.

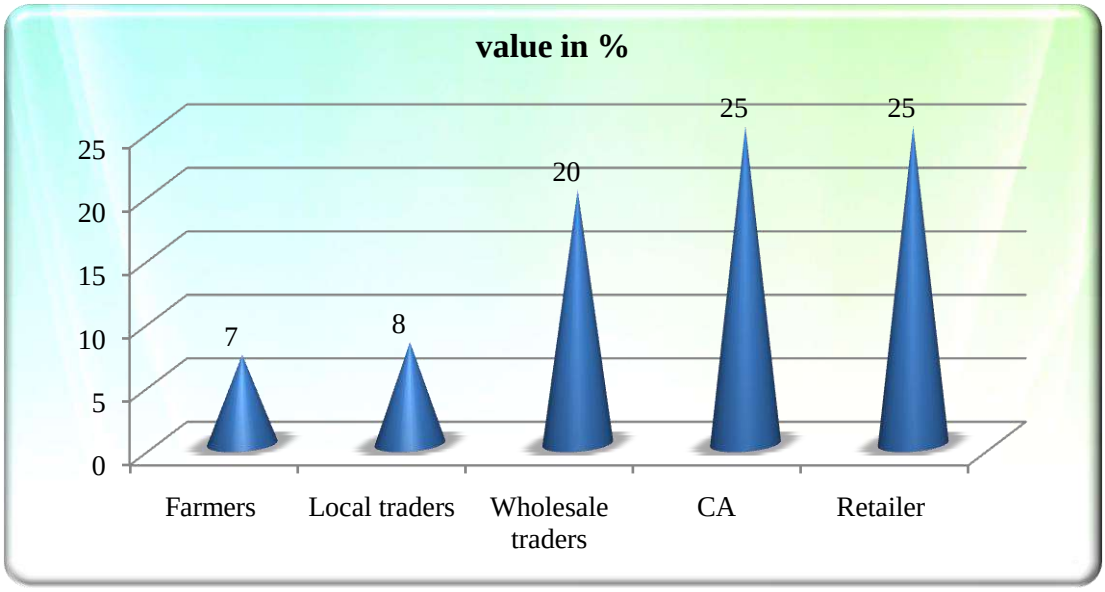
Price spread

The price spread for Ashwagandha for a particular channel along with its player is given below for each kilogram of dried root:

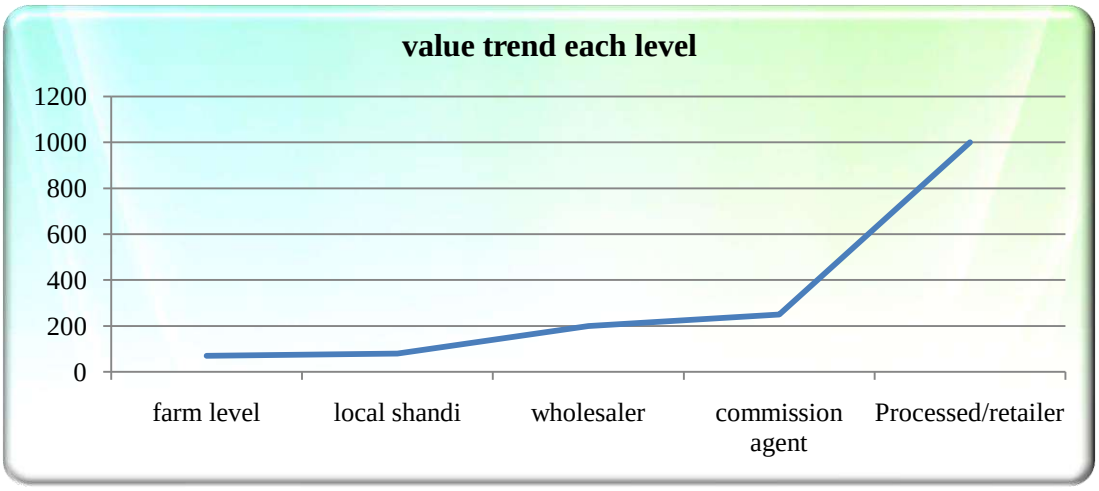
Table 33: Price spread for Ashwagandha for a particular channel along with its player is given below for each kilogram of dried root

Farmer	Local trader at village or district level	Wholesale trader	Commission agent	Retailer/manufacturers (powdered /root)
Rs. 70-90	Rs. 80-110	Rs. 200 to 350	Rs. 250 to 400	Rs. 1000 to 3500

Now, if we talk in terms of value addition at every level keeping the intermediaries in a single level due to their similar role in the supply chain we conclude the following chart:



- ❖ Farmers' share in entire value is only 7% though most activities are conducted at producer level.
- ❖ The major chunk of share that is 50% of the value is enjoyed by commission agent and retailers.
- ❖ Farmers lose 12% due to lack of awareness about wholesale market.
- ❖ Processing increases the value of Ashwagandha by more than 25%.
- ❖ Farmers' share in consumer price: 8%



The above graph depicts that there is a sharp increase in the graph as processing of roots are done. On the other hand there is hardly any value addition between farmers and wholesalers as well as between wholesalers and commission agents. The major conclusion that can be drawn is the local traders and commission agents are the major bottlenecks of the value chain. The efficiency of the channel could be higher without the presence of these in-between players.

Inefficiency in supply chain of Ashwagandha

The value chain of Ashwagandha in Telangana is inefficient majorly at three levels namely production, wholesale trading and manufacturing units. At production level, the farmers are still unaware of the best quality seeds of Ashwagandha, soil preparation and soil testing, organic fertilizer and pesticides. As seen above the farmer's share in consumer price is not even ten per cent. This happens due to unavailability of market near to the production site. The wholesalers are approached by the middlemen with their samples of dried roots. Due to transportation of roots from distant villages to cities the root sticks of Ashwagandha gets broken, becomes wet due to mishandling till it reaches the wholesalers. As a result the sample shown to the traders is better in quality than the bulk material that reaches the traders. The manufacturers eventually receive degraded material from them. The manufacturers of Telangana therefore prefer to buy from Neemuch and Mumbai rather than roots produced in the state. Also due to low connection with the producers and the presence of a series of middlemen in the value chain the accountability of receiving material on time is reduced.

The small manufacturing units still depend on mechanical methods of sorting, cleaning and grading of the roots.

Table-34: Level of intervention

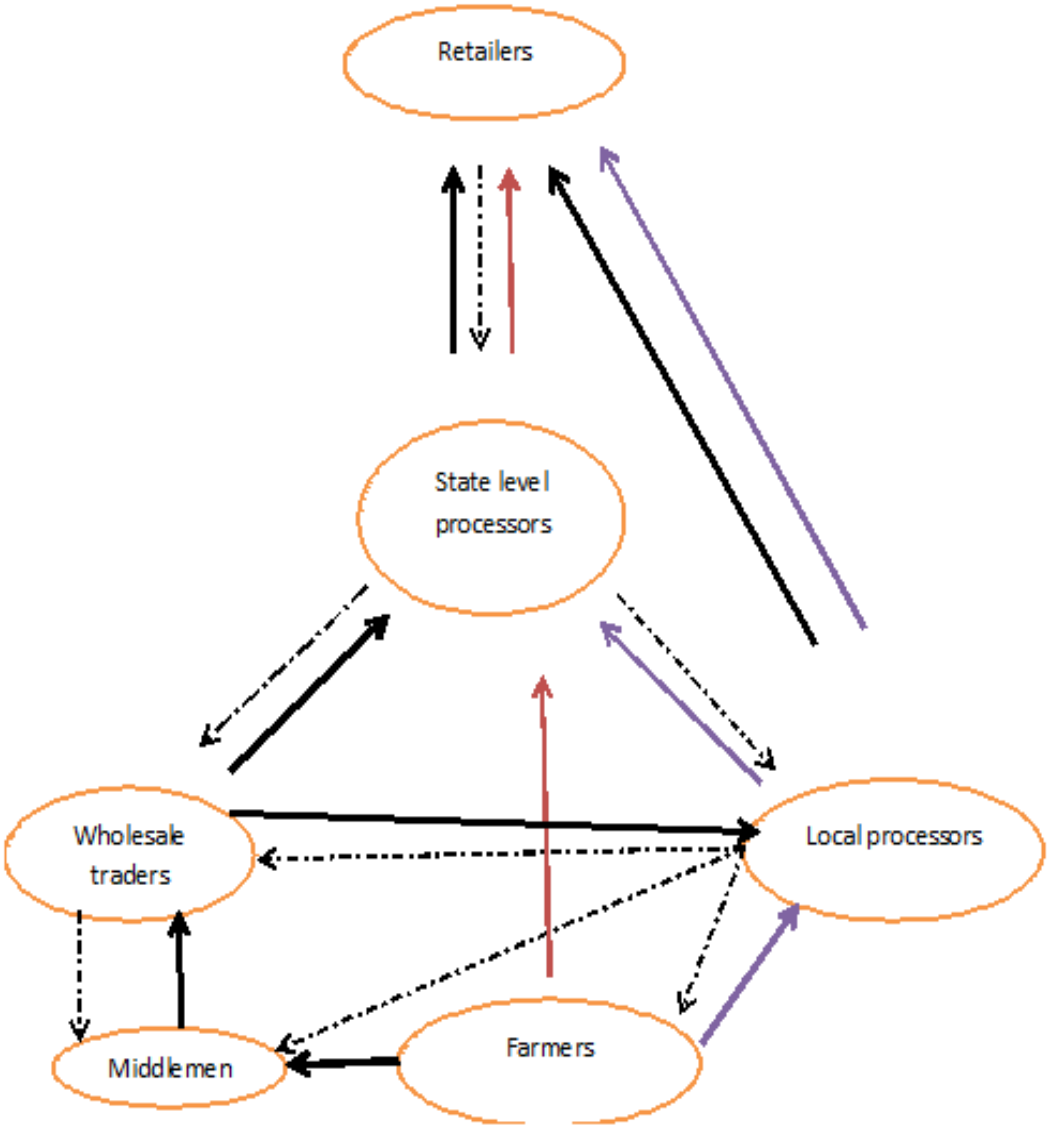
Level of intervention	**Inefficiency of the level**
Production level	Lower price at farm gate; lack of knowledge about markets, market price, and input supply; post-harvest losses; low quality of production;
Wholesale level	Quality loss due to transportation; lack of proper infrastructure in the market; dependence on middlemen for material procurement; irregularity in supply of material
Manufacturing level	Obsolete technology of processing; high material loss due to rejection during grading;

12.2 Supply chain of Aloe-vera

Aloe-vera is a highly perishable produce and it is difficult to transport Aloe-vera leaf without processing in far off distances. Therefore, most of the processing units are either in the producers' districts or at Hyderabad outskirt manufacturing units.

The usage of Aloe-vera varies from cosmetic products; neutracitical produces as well as naturopathy medicines. The quality of Aloe-vera differs mainly based on medicinal active ingredient and organic production.

First, let us study the different value chains of Aloe-vera prevalent in Telangana. The flow chart given below is a pictorial representation of flow of material and information in the state.



The above chart depicts both flow of information and material in the Aloe-vera value chain in Telangana. The dotted lines depict the contract or buy back order for Aloe-vera from higher levels of value chain. The different coloured arrows illustrate different value chains existing in the state.

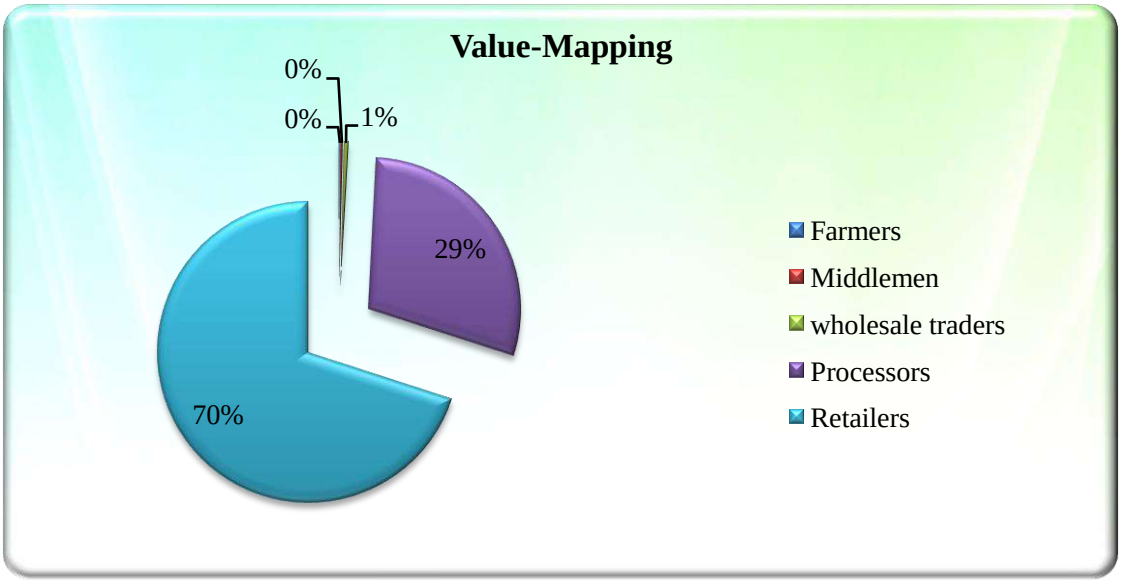
Aloe-vera is traded mainly through buy back or contractual agreement among various players. The process starts at the higher end where a demand is placed by the processors to the lower level traders and intermediaries. The higher-level players for future demand contact the farmers. The major players are:

- **Retailers:** Aloe-vera is sold by various sectors of cosmetics and medicinal industry. The retailers of Aloe-vera are big pharmacy giants, cosmetic companies, folklore healers, micro beauty and well-being organization.

- **Processors:** This is the most important stage in the value chain as processing of Aloe-vera needs increases its value much higher than most other herbal produces. The processors are at state level as well as local district level. As it is highly perishable and storage of raw leaves is not available readily, the processing must be done soon after harvesting.
- **Wholesale traders:** Wholesale traders are the bulk suppliers in various districts of Telangana. They are linked with either the intermediaries or farmers. At the state level, the middlemen approach the traders with the available material. The traders then negotiate on price and check the grade of the leaves before purchasing.
- **Middlemen:** The middlemen are the main connectors between farmers and other higher value players.
- **Farmers:** Farmers are involved mainly in production, harvesting and post-harvest activities. The middlemen or local processors approach them with a demand in advance.

Table 35: Price spread of Aloe-vera

Players /stakeholders	**Farmers**	**Middlemen**	**Wholesale traders**	**Processors**	**Retailers**
Price per kg	Rs. 1-3	Rs. 2-4	Rs. 5-8	Rs. 300-600	100x- Rs 900 200x- Rs 1500



- The above pie chart clearly portrays that the major chunk of the share is enjoyed by top 2 players of value chain.
- The valuation increases to 99% after getting processed.
- Farmers do not receive even 1 % of the share in the entire chain.
- Farmers' share in consumer price: 0.1%

Inefficiency in Aloe-vera value chain

The biggest inefficiency in Aloe-vera value chain is low price received by farmers. The highest value addition in Aloe-vera value chain happens during processing. Also, due to high perishability Aloe-vera needs to be processed soon after harvesting. This limits the farmers to produce large quantity of Aloe-vera without any buy back contract as there is no scope of local processing available for them in the block or district level. Out of all medicinal plants the farmers share in consumer price is least at present for Aloe-vera. The demand for Aloe-vera in drug and cosmetic industry is increasing everyday but in the form of extracts and gel. The farmers have the emergency to sell the raw leaves and traders or middlemen take the advantage of the situation. The farmers can be encouraged to produce large quantity of Aloe-vera only if they have the scope of selling processed material.

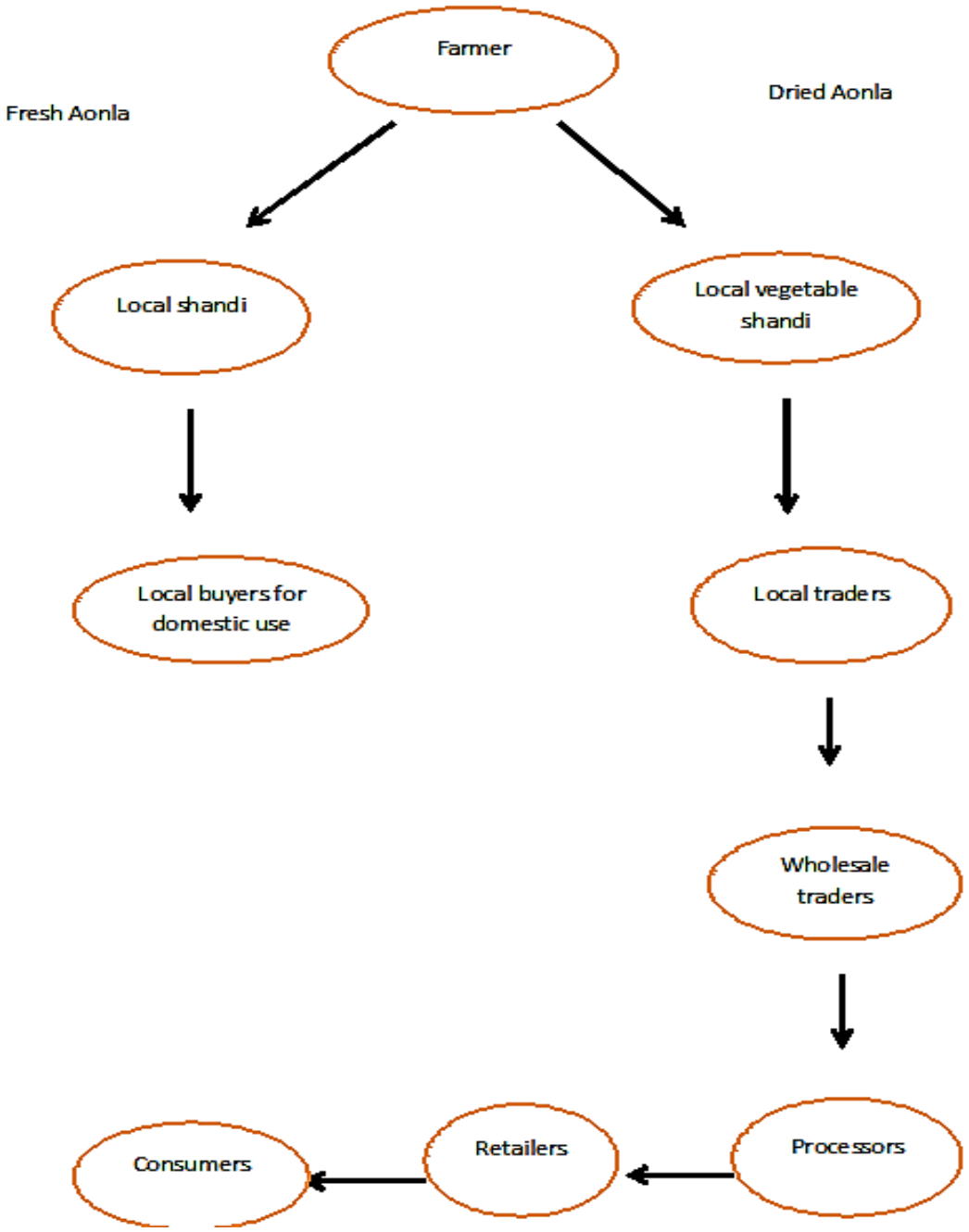
12.3 Aonla

This section talks about only cultivated Aonla of Telangana. The next section will discuss the wild Aonla management. This is done as wild Aonla is treated as an NTFP material in Telangana and its supply chain is different from the cultivated ones.

Supply chain of Aonla in Telangana

The cultivated Aonla can be divided into two supply chains viz. fresh Aonla and dry Aonla. The ratio of fresh Aonla and dry Aonla is 1:4 in terms of demand of Aonla.

Value-chain of Aonla



The flow chart, above shows fresh Aonla has an insignificant stake as compared to dried Aonla and is only used as a domestic use by local buyers in small quantity. The dried Aonla on the other hand passes through a series of players to finally reach the consumers in different processed forms. The use of Aonla is manifold in drug, food and cosmetic industry. The by-product of Aonla fibre is again used by many cosmetic and food industry companies. The case study of Aonla wine will give a better insight of reuse of Aonla after extraction of juice from the fruit.

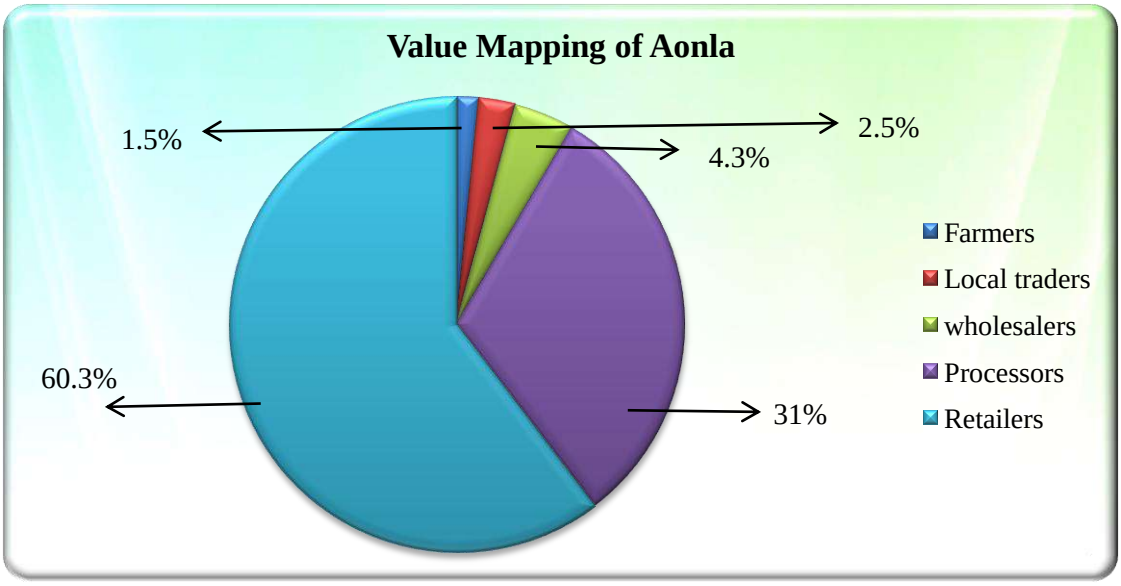
The farmers bring in small quantity of Aonla in dried form in the vegetable market. The local traders make their bulk procurement by buying from each of these farmers in the market. The wholesale traders in turn check the sample material and place an order as per demand of the manufacturers. The wholesale traders send the material to the processors and finally the retail outlets sell the packaged products to the customers.

Next let us see how price is spread at each level of these value chain players. The table below will show the price on an average of all seasons received by each of the stakeholders in the Aonla value chain in Telangana.

Table 36: Price spread of Aonla

Players / stakeholders	Farmers at vegetable shandi	Local traders	Wholesale traders	Processors	Retailers
Price per kg	Rs. 7- 15	Rs.12-15	Rs. 20	Rs.145	Rs.280

The share at each level will be visually clearer with the value mapping at each level of the chain.



The pie chart above shows that the maximum value is added to aonla at the retailers' level. Unprocessed dried Aonla has only 10% value in the value chain. The demand of Aonla is different for its various usages and so is the price according to quality, freshness and variant. The Aonla used for medicinal purpose requires high

amount of active ingredient and Aonla used in food industry requires more pulp, juice and fibre. The cost incurred in processing also changes as per the product manufactured by the manufacturer. The processing and retailing prices mentioned here is an average price received by these players. Due to lack of proper channel, farmers lose upto 7% of the share in value chain.

Inefficiency in Aonla value chain

The Aonla value chain faces some common problems faced by medicinal plant based parts and a few specific issues to Aonla fruit. As seen above Aonla farmers lose a substantial portion of value to the aggregators. The reasons for the persisting gap are:

(1) Small amount of production by individual farmers

(2) Lack of wholesale market accessible to the Aonla growers. The manufacturing units wants Aonla in dried form preferably sorted and graded at their factory gates. Their requirement is seasonal and in bulk quantity. Individual farmers find it difficult to fulfil such requirements, and this cavity of reach is filled by the aggregators. The aggregators in turn share a good margin of around 3% without any tangible value addition to the product. Lack of proper storage and high perishability of Aonla forces the farmers to sell their produce at a low rate. Due to small production, the creation of proper storage of Aonla is not feasible. Delving deeper into the scenario we find that each of these bottlenecks are interrelated to one another and form a cobweb of high correlation. For example the farmers in Telangana reported to grow only traceable amount of Aonla due to low price, no storage and lack of regular market. At the same time proper storage and high price is not possible as production is very low.

12.4 Activity chart of different stakeholders in value chain of Aonla, Ashwagandha and Aloe-vera

The chart given below shows the activities performed by each stakeholder in value chain. The highlighted column reflects that the particular activity is carried out by the stated player.

Table 37: Activity table carried out by stakeholders

Activity list ↓ / **Stakeholder list** →	**Farmers**	**Local sellers**	**Commission agents**	**Traders**	**Retailers/ processors**
Input supply					
Production					
Harvesting					
Primary grading					
Sorting					
Drying					
Storage					
Packaging					
Transportation					
Processing					
% of activity done	70%	50%	10%	50%	40%

The purpose of the above table is to identify the activities done by each of the players to assess the risk incurred and return fetched by them. The following conclusions can be drawn from the table:

1. Farmers conduct the highest amount of work in terms of number of activities but not in value addition of consumable product.
2. Traders at all level have a specific amount of tasks that can be done by farmers as well. As the farmers do not have good knowledge of hygienic sorting and cleaning the traders do the grading to fetch a better price of the produce.
3. The role of commission agent in activity chart is the lowest, as they do not add any value to the original produce but act as an intermediary among other stakeholders.
4. The harvesting and post harvesting activities are highly dependent on the farmers. it is therefore important that the growers of these medicinal plants have necessary knowledge of the techniques of sustainable harvesting and post harvesting activities.
5. Transportation cost is borne by all players of the supply chain. The farmers invest heavily on production but the transportation cost is lower than other players as they either sell the material at the farm or at local vegetable shandis. The quality loss due to transportation is experienced most by the higher-level players in the chain.

CHAPTER 13

WILD AONLA MANAGEMENT IN TELANGANA

The Indian villagers, forest dwellers and indigenous people have an ethno-social-cultural relationship with the forests in and around their villages. They have been depending since time immemorial, upon the forests to keep rolling their economy and to conserve their culture. Non wood products including Aonla fruits (*Emblica officinalis*) is one of the major source of income generation in the rural and forest areas. Non Timber Forest Product (NTFP) extraction has multiplier effects in the economy by generating employment and income in downstream processing and trading activities. NTFPs are often deemed as 3semi-public goods, with no explicit property rights and no opportunity cost vested in the collector.

Telangana has a varied forest area and a number of dwellers who collect wild Aonla as a source of their livelihood. After Telangana is separated as a different state, the collection of wild Aonla is mainly happening under Girijan Cooperative Corporation. It has been seen that Aonla processing and valuation as an NTFP resource is at a nascent stage until date. The GCC officials have reported that there has been no initiatives for Aonla processing by the organization. As a result aonla collectors are falling back in the trap of many illegal traders and succumbing to unsustainable practices of collection.

This part of the report discusses the status of Telangana in wild Aonla management and how GCC is involved in the endeavours.

- **Present area of collection (as per GCC):** Nallamala forest area of Telangana
- **Season of collection:** November to March
- **Collectors:** forest village dwellers of Nalgonda and Mahabubnagar districts of Telangana

13.1 Girijan Cooperative role in aonla

Aonla can be found in the form of cultivated as well as a minor forest produce. In one hand many experts claim that wild Aonla has more medicinal value in the form of wild collection others view that cultivated Aonla possess better flesh and juice thus will have a better demand.

Girijan Cooperative Corporation was set up in 1956 much before the bifurcation of Telangana from Andhra Pradesh. Its basic functions are:

- Purchasing Minor Forest Produce (MFP) and Agricultural Produce (AP) from them at reasonable and fair prices.
- Supplying Essential Commodities (ECs) and other Daily Requirements (DRs) at a fair price through a network of 838 Fair Price Shops otherwise called as Daily Requirement (DR) depots.
- Meeting their Credit requirements in an easy, convenient and effective manner
- Imparting training to the tribal in collecting the Minor Forest Produce so that yields can be increased without endangering the trees and environment.
- Collecting the Minor Forest Produce at the very doorstep of the tribal
- Guarding against deterioration and degradation of their produce
- Researching to find better gradation and storage techniques
- Pro-active search for adding new Minor Forest Produce to the list

13.2 Procurement of wild Aonla in last 5 years

The importance of GCC is to uplift the market of wild Aonla and understand the condition of Telangana after the bifurcation of the state from Andhra Pradesh. It has the sole monopoly of NTFP in both the states and only source of information about wild Aonla.

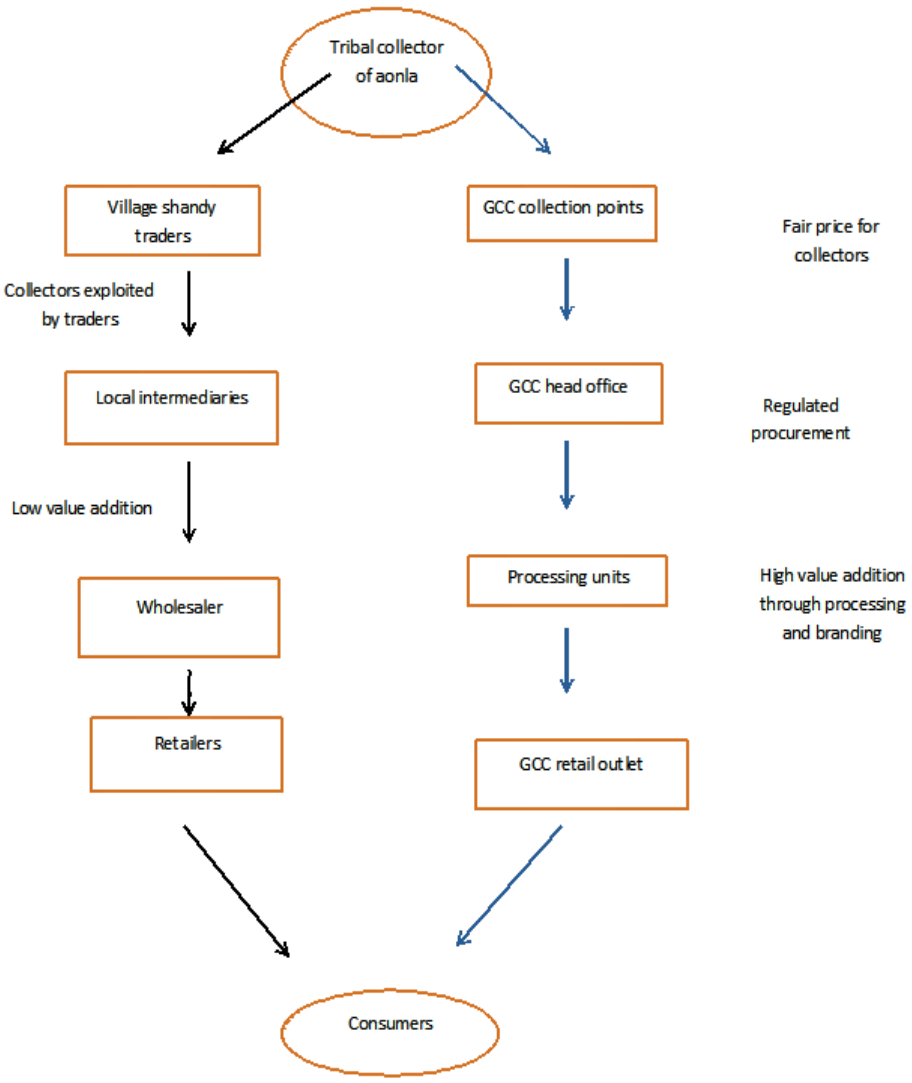
Let us look what GCC recorded in last 5 years procurement:

Table-38: Collection of Aonla by GCC

Commodity	Qty.	Val	% share in ntfp	Qty.	Val	% share in ntfp	Qty.	Val	% share in ntfp	Qty.	Val	% share	Qty.	Val	% share
Dry Aonla	No rec.	No rec.	NA	No rec	No rec	NA	No rec	No rec	NA	17.62	0.79	0.33	No rec	No rec	NA

- The above graph clearly depicts the lack of data about collection practices in last 5 years.
- The share of wild aonla in NTFP is very negligible (0.3%) to have any significant contribution.
- Aonla is still not considered an important NTFP resource in the state.
- High possibility of illegal trading of wild aonla in the state.

13.3 Marketing channels of wild aonla in Telangana



13.4 Major challenges in wild Aonla collection in Telangana

1. Bifurcation consequences of Telangana

Majority of the collection of GCC is done from AP area after bifurcation. The processing units are established in AP and that's why the activities are shied away from Telangana. The percentage share of Andhra Pradesh in total procurement of GCC in last 5 years is as below:

Table 39: Percentage of procurement by GCC

	Percentage of procurement by GCC				
Name of state	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Andhra Pradesh	74.4	71.41	64.5	92.7	97.5
Telangana	25.5	28.5	35.5	7.2	2.45

2. Low monitoring by forest department

The forest department of Telangana has not showed much progress in terms of enforcing NTFP schemes in the state. The entire responsibility of NTFP management is deployed to GCC.

3. Lack of new initiatives and strategies for NTFP

As per GCC head office in Hyderabad, the state is yet to take any substantial initiatives to enhance the collection and processing practices of minor produces in the wild. After the bifurcation the state is solely dependent on AP to procure its Aonla and other minor forest produces.

Processing point of Aonla collected in Telangana	District processing unit, namely *SSP unit at Rajahmundry in Andhra Pradesh.*
% of Telangana wild Aonla travelling to AP for processing	90% of total collected Aonla.

As a result the cost margin for the Aonla products grow unnecessary. On the other hand, it has been argued that due to low quantity of collection in the state the feasibility of any processing unit is low.

4. Redundant technology of processing

According to the officials the cooperative is still using manual techniques for deseeding Aonla. The pulp extraction machine used by private sector organisation is still alien to the organization. As a result, the efficiency of the processing units is lowered.

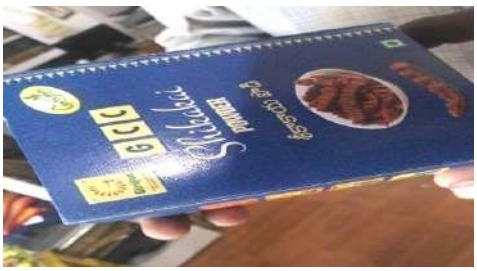
Technical input	Methods used by GCC	Industry standards
Deseeding of Aonla fruit	• Manual deseeding in boiling water	• Pulp extractor with attached boiler
Storage facility	➢ Low scientific storage at collector point	➢ Collection point storage is not undertaken by commercial organizations.
Weighment facility	❖ Low inspection of higher officials.	❖ Weight taken at processing gate in the inspection of processing unit head.

The major consequence of redundant technical input at processing units is low efficiency in production and high cost on manual labour.

5. Trespassers and local traders

The primary objective of GCC was to impart fair price to the tribal collectors for upliftment of their socio-economic conditions. However, adversely, the local traders purchase pre mature fruits at a lower cost from the forest dwellers.

13.5 GCC intervention: opportunity, issues and challenges



The role of GCC in the NTFP management in Andhra Pradesh and Telangana needs no introduction. 70 years ago, Girijan Co-operative Corporation (GCC) undertook the guardianship of the tribal (Girijans) of Andhra Pradesh. GCC was instituted with the sole purpose to protect them from exploitative middlemen, petty traders and establish a mutually beneficial relationship between them and rest of the world.

Tribal role in GCC intervention

The role of tribal in the process is restricted to collection and deseeding of aonla. The collectors of NTFP are allowed to sell the collected produces only at GCC centre. The collection involves men, women and children, as their livelihood is dependent on NTFP for this period of the year. These collectors do the deseeding manually by boiling the fruits using forest fuel. The aonla is dried and brought at the collection centres of GCC. The GCC centres weigh the material and make payments to the tribal.

The role of the tribal end at this stage in the value chain.

Procurement of aonla in last five years by GCC

The procurement is done by GCC at collection centres. The rent houses are taken from FD for 15% turnover value annually. GCC mainly collects wild fruits in dries form without seeds. The movement of unprocessed aonla is at two levels. First it moves from forests to the godowns of GCC, thereafter the fruits are taken to the processing houses.

Given below is the data of aonla collection done by GCC in last five years. The data for 2016-17 is acquired until September.

Table 40: Quantity procured by GCC

Year of procurement	Quantity in quintals	Total value in lakhs Rs
2012-13	70.23	3
2013-14	925.13	41.68
2014-15	747.84	33.58
2015-16	582.00	21.15
2016-17	190.05	8.55
Total	2515.25	107.96

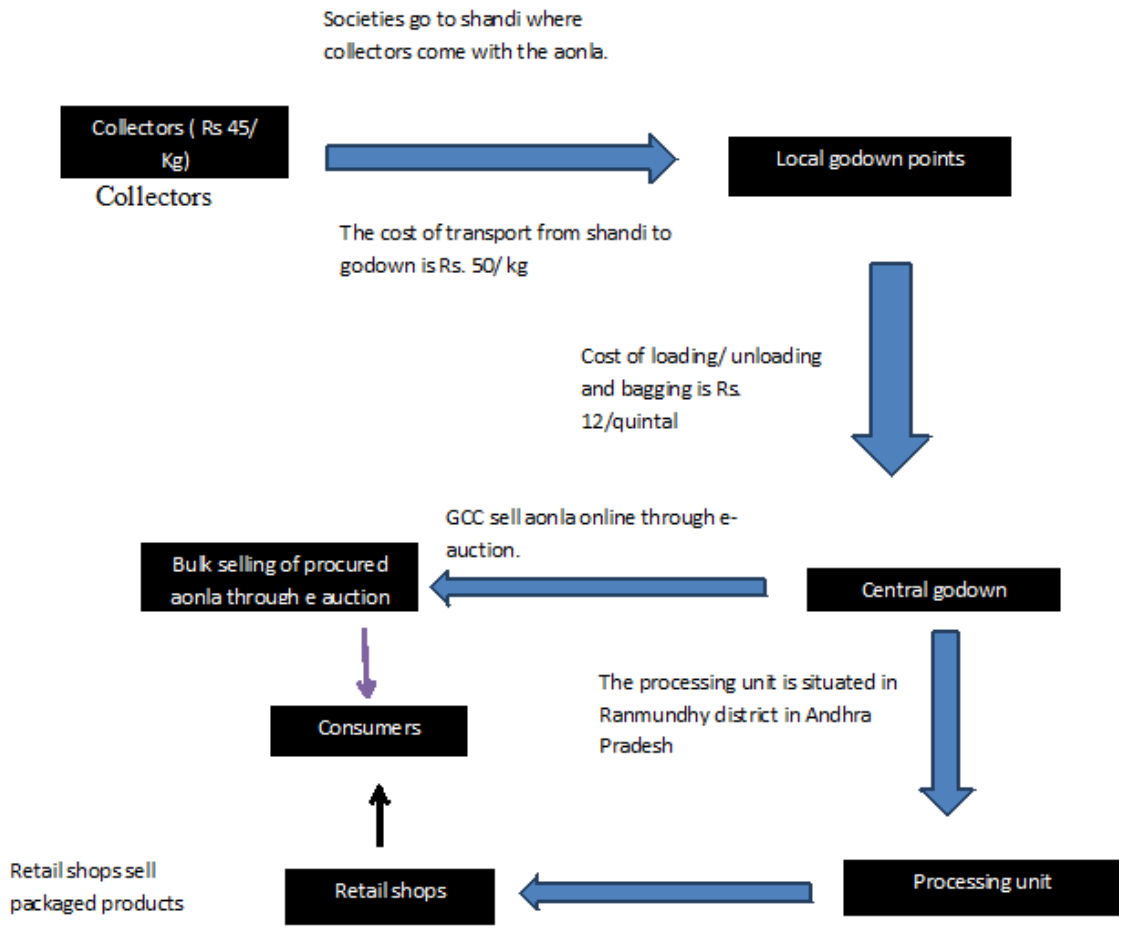
In last 5 years GCC have procured 2515.2 quintals of aonla at a total value of Rs. 107.96 lakhs. The highest procurement was in 2013-14 and lowest in 2012-13. However, it needs to see the reasons behind the decline in the procurement in the year 2016-2017

Quality checking of Aonla at GCC

- For understanding the quality parameters TRIFED gave training to the processors.
- During procurement, the main quality parameter checked is whether deseeding is done properly or not.
- Inside the processing unit there is not much focus on quality during different stages of processing.
- No quality check on active ingredient or freshness on fruit is done.

13.6 Supply chain management in Andhra Pradesh processing unit

The supply chain starts at collector end and finishes at retail end. Let us look at the supply process in the flow chart below:



The collectors where they meet the cooperative staff and sell their material bring the dried aonla to the shandi. Next the staff of GCC takes the fruit to local godown from there it finally reaches the processing godown. The processing godown then grinds the aonla and products are made, packaged and sent to different GCC outlets. The majority of the produce is processed and a minor amount is sold through e- auction.

GCC Retail Outlet

The processing unit of GCC has three pulveriser. The capacity of the unit is 1 ton/day and utilization is 2 ton per month. The cost of production for one kg of material is Rs. 35/-.

13.7 Challenges faced by GCC

- ✓ The NTFP produces are monopolized items and GCC gets year wise lease after every financial year by the PCCF of forest departments. The produces cannot be procured by GCC without the lease. Hence, as lease sanction is delayed the procurement ceases by GCC. At present Telangana has applied for the lease whereas Andhra Pradesh already has an extended list until March 2022.
- ✓ According to PESA every tribal can sell its products to their choice of customers. But at the same time the forest department and GCC sets a monopoly policy on NTFP items. Now the tribal seek execution of PESA to have multiple selling options.
- ✓ Many illegal traders have penetrated in the process. These traders are many times closely related to the tribal. They have faulty weighing machines. So they trick the tribal with a higher price offer and cheats during weighing. It is apprehended by GCC marketing board that only 10-15% of the material comes to GCC and the rest is traded illegally outside.

To understand the other drawbacks, it is important to know at which points GCC is lagging and at the same time to know its scope the competitive advantage of GCC over its competitors should be acknowledged. To carry this out GCC processing unit is compared to Dabur processing unit.

The following lines will tell us how GCC is different from Dabur by comparing GCC Andhra Pradesh with Dabur limited Jabalpur.

Company type

- ➢ GCC is registered as a cooperative whereas Dabur limited is registered under company act 1956.
- ➢ GCC has the advantage of cooperative taxing which can help them set a competitive pricing on the other hand Dabur is a commercial company with no exemptions.

Procurement

The aim of GCC is to uplift the tribal and change their socio economic status. Therefore, GCC makes it purchase from the tribal majorly wild aonla. On the other hand Dabur has its trusted dealer agents who bring them material from Pratapgarh, Uttar Pradesh.

Dabur has the advantage as it procures cultivated material with high fibber and juice content. GCC collects wild Aonla that are smaller in size and fibre content. Now it should be noted that it has been claimed that wild Aonla has more medicinal properties and high immunity than cultivated ones. GCC should use this fact as a positioning factor in the market.

Processing

- Deseeding is done manually by tribal collectors in GCC whereas in Dabur boilers are used to carry deseeding of material
- Sorting and grading is done by Dabur at two stages. At the gate, material with more than 10% defect is rejected. Next at conveyers the vibrators throw away the foreign particles from the material. In GCC sorting and grading are not emphasized to this extent. Deseeding is done by the tribal before any sorting. This process decreases the efficiency at the beginning itself.
- The capacity of GCC is 1 ton per day and capacity of Dabur is 70 ton per day. High production ensures economy of scale thus reducing cost of production per unit.
- Utilization of capacity showed a shocking difference between the two companies. While Dabur reported a 75% utilization while GCC reported utilization of 6.6%.

Advertising and promotion

- There is a vast difference in advertising and promotion between the two companies. Dabur spends heavily on promotion and advertising using every medium as its platform. On the other hand GCC sends out pamphlets and local print media as its advertising medium.
- Dabur has introduced new product line at regular intervals to keep a pace with the market. GCC extends its products in simple items like juice, soaps and hair packs.
- Dabur is an international company with global presence while GCC has its footprint only in south India.

13.8 Scope of improvement in collection and value addition of wild Aonla in Telangana

- The tribal requires proper training and capacity building about the wild Aonla collection and deseeding techniques so that hygiene and efficiency can be increased. They need to be made aware of the exploitations done by traders. The forest department and GCC must build an institution of trust with the tribal. The tribal people must be involved in many regulatory activities to curb illegal trading. For examples few men from tribal community must be employed as guards against illegal trading. Another important factor that hampers the collection is premature plucking. Tribal are poor people who get easily lured to get un-ripen fruits for exchange of easy cash. Trainings should be given to make them aware of the loss they can incur due to this activity. The involvement of women in the process should be increased. Women should be trained, as deseeding of material is mainly done by women in their households.
- The involvement of forest department must increase for conservation of NTFP and sustainable collection. GCC and forest department should collaborate at every stage of collection process.
- It has been claimed that wild Aonla has better medicinal value but there is not much evidence to support this claim. GCC must invest in wild Aonla research as it has the advantage of positioning itself as a unique organization working only with Aonla of high medicinal value. The active ingredient must be tested so that it finds more applications.
- GCC must carry out low cost high impact advertising technique to have a footmark in the south herbal industry. This region is flooded by local companies and even the industry giants consume a good share of the market. In such cases, GCC needs to make its presence feel in the south population. It can arrange free Ayurvedic health camps, distribute free sachets of its products at retail stores, tie-up with supermarkets and online grocery stores to promote its products. As GCC has started producing juices and candies, it should target the schools and colleges in Telangana & AP to supply its products. The price of GCC products are competitive as per other commercial companies. GCC can tie up with many health and beauty centres to supply Ayurvedic products. Also it should be advertised heavily that GCC has the mission of tribal welfare. Every packet of GCC must advertise its mission so that more and more people can acknowledge.

- ❖ GCC needs to improve the current utilization factor. It must make enough procurement so that utilization is optimized.
- ❖ New applications of Aonla should be made at regular intervals.
- ❖ The above pages show Telangana GCC is yet not regular in keeping good record of its produces. The documentation must be done at the collection centres and reported to head offices regularly.
- ❖ The NTFP of Telangana travels until Rajmundri for processing. Telangana must plan its own processing unit. The unit should not be a replica of Andhra Pradesh unit. Instead new technologies should be explored at each level of processing.
- ❖ Tribal must be involved more in the GCC interventions. They can be employed during lean period of the year at processing units and retail shops.

CHAPTER 14
AONLA WINE IN TELANGANA

Case study for innovative & growing applications of Aonla-an innovative marketing

14.1 Introduction to Aonla Wine

Aonla or Indian gooseberry has been carved in Indian naturopathy systems since ages. It is identified to be a native fruit in the subtropical regions like India and Sri Lanka. Aonla has the ability to withstand high saline soil with a pH level of 6-9 and can survive under drought conditions. As a result it is an opportunity for the farmers in dry arid regions to grow Aonla commercially instead of crops that demand water and quality soil.

The custom of Aonla is absorbed throughout the history of our civilization. Ayurveda has incorporated it in Triphala due to its extreme medicinal values. It is very rich in vitamin C and is used to cure many diseases like diarrhoea, dysentery, anaemia and jaundice. It is extensively used in cosmetic industry in the form of hair oil, face packs, face creams etc. As Patanjali revolutionised the Ayurvedic industry in India, Aonla now can be found in different drinking juices, hair dyes and other above mentioned products grasping a much larger segment of consumers who earlier shied away from herbal products. The humble fruit has travelled from being a medicine to beautifying people due to its immense goodness in juice and fibre.

It is therefore observed that the growth of Aonla is due to its growing demand as well as introduction of newer applications and uses in different forms. Aonla wine, though a traditional system of wine making, is a new concept in the commercial wine market. The wine industry is in a growing phase and every year the market in India is increasing by 15-25%. Hence including use of Aonla in wine production may be the next biggest step for increasing the scale of application of this fruit.

The following pages will deal on how it has a potential to elevate the use of Aonla, consequently increasing the scope of more production of raw Aonla.

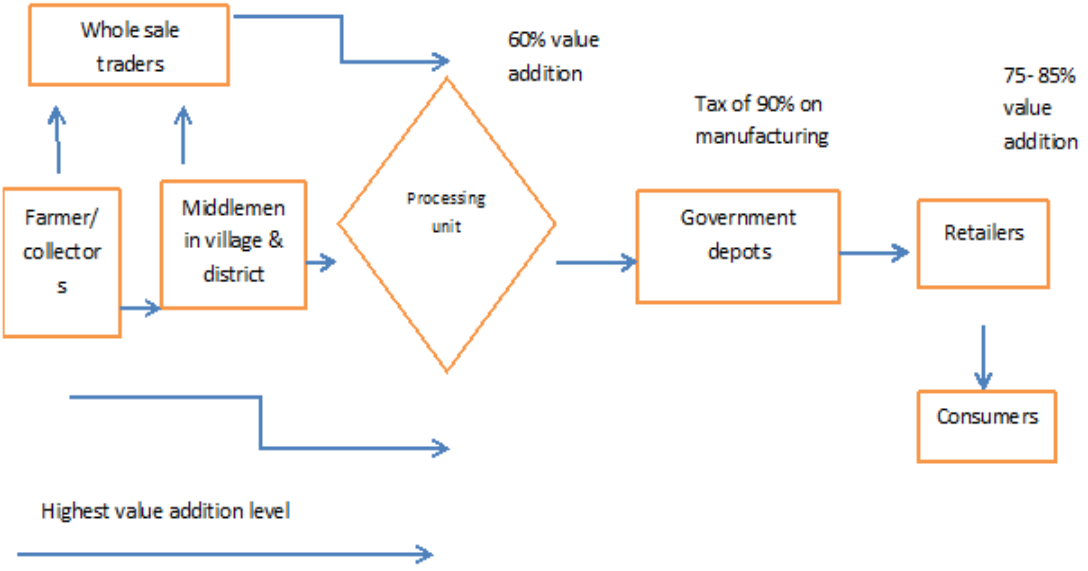
14.2 What is Aonla wine?

1000 years ago alchemists transformed Aonla to wine through the process of fermentation. The palate of this drink is complete, strong with a sense of cleansing and balancing the digestive system.

The wines can broadly be categorised into dry and sweet forms. Aonla is fermented using yeast that turns the sugar into alcohol. When the entire sugar is transformed it becomes a dry wine and when the maker decides to cease the fermentation before complete sugar is lost it forms a sweet wine. The residual sugar in the drink imparts sweetness in the wine. The ageing of the wine is characteristically between 3-5 years.

14.3 Processing of Aonla Wine

A prominent processing unit can be established in 3-4 acres of land. Around 32% alcohol is needed from the extraction. The value chain of the wine making starts from the farmers' land or wild Aonla collectors and it is sent to the factories either directly or through a chain of traders. The purchase price of Aonla is totally market driven and depends on seasonality of the fruit. The supply chain, on the other hand, is based on many factors like distance, awareness of market, transportation availability and communication with the traders or manufacturers. A typical value chain of Aonla is depicted below:



Raw aonla reaches the manufacturing unit through various routes. The different channels of raw aonla procurement are as follows:

1. ***Farmer / wild fruit collector***: The manufacturers directly contact the growers and collect the material. Many times this method is not preferred due to bulk requirement, guaranteed supply of material and cross trading.
2. ***Wholesale market***: A major chunk of material is procured from these whole sale markets. The wholesale traders purchase from commission agents or middlemen who in turn fetches the Aonla from its growers. The Aonla reaches this market through different middlemen and cost is raised due to many toll taxes and transit costs.
3. ***Private traders cum commission agents***: Contracts are formed among manufacturers and trading dealers yearly or semi yearly basis depending on the demand for wine.

The value addition capitalises most at the manufacturing unit where prepared bottled wine rises to 60 % of the total value. The retailers gain a margin of around 30% depending on brand and cash back given by the manufacturers. The farmers' share in consumer price is merely 10-12 % and it decreases further with increase in supply channel width.

Processing unit

Interviewing
Chairman of Vijaydurga Private Limited

This section of the article deals with the processes that go inside a processing unit of wine making. As the raw material reaches the gate of the factory it is checked for its quality. Once the quality standards are met it is sent to for washing. It then passes through a series of processes as given below:

1. The fruits are sent to processor where it passes through a conveyer. The fruits are washed and passed on for crushing.
2. The fruits are crushed and seeds are separated in the fruit crusher and pulp is formed.
3. The fermentation vats are used to form the alcohol from the crushed pulp. Sugar and yeast is added to the pulp. Mineral water is added to balance the acidity.

4. Finally the syrup is passed to the wine ageing vats where it is stored for around 3 years to form the final product.

To establish a 10,000 litre/day capacity unit, the expenditure is around 3 crores of rupees. The major cost factor is the processing machinery which costs 80 lakhs of rupees.

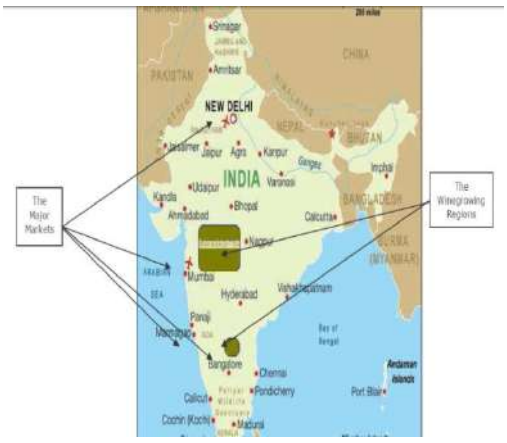
14.4 Trade Policy

The GOI provide support to the nascent Indian wine industry in the following ways:

1. Direct subsidies for winery development – payment for to 25-33% of the start-up costs for capital investments of wineries (to a cap of US$ 160,000).
2. Capacity building initiatives – technical trainings on viticulture, enology, and winery development
3. Research Assistance – rootstock trials, variety selection, pest/disease management research
4. Laboratory development assistance – for wine analysis
5. Proposed formation of a National Wine Board, which will be arranged as a Private-Public Partnership that will support growth initiatives for the Indian Wine Industry

Indian wine industry is still at a nascent stage compared to other alcoholic beverages. The government's protectionist trade policies along with growing demand in wine market can build a conducive environment for domestic industry. However, due to its agreement with WTO India has got into many disputes with European Union and United states accusing India of violating international laws for National Treatment. The authority for excise policy for wine is solely under the state government and it decides the pricing, distribution and sale of wine for its state. According to the storage regulation, wines will be stored only in government approved custom bonded warehouses and can be released only when it meets all the requirements of the state policy.

As follows, the state government has the uppermost hand in protecting the stakeholder interest in the wine industry which gives another way of marketing of Aonla in the state.



14.5 Market Study

Wine has a unique place in the alcoholic beverage market as it is considered more sophisticated, healthy and socially more acceptable, especially by women. Many studies have shown that wine scatters to the upper class of population that accounts for about 5% of the population. The imported wines are widely favoured due to its quality & packaging while domestic wines have been purchased for its value for money.

The biggest market of wine is Mumbai and Delhi where people having higher disposable income and bringing in new life style changes prefer consuming wine. Now cities like Hyderabad, Bangalore and Nashik are an emerging market due to growth in IT industry in these cities. Nearly 80% of total wine sale can be estimated in these states only.

Aonla wine, being a domestic player, has to repackage itself with competitive taste, health benefits and attractive packaging. A good example can be set by M/s Vijay Durga Wineries selling aonla wine under Elixir brand in different states. To maintain a balanced taste it emanates in many flavours like pineapple, grape, apples, strawberry and banana in both sweet and dry forms of wine. For packaging purpose the company imports bottles from China reducing its cost by almost 10 rupees per bottle compared to the prices incur in India, nevertheless maintaining a similar attractiveness in packaging that a customer experiences in imported wine.

14.6 Competitive Advantage of Aonla Wine

The Aonla wine production in India is limited to a few hands who in turn didn't tap even one fourth of the potential market. The new manufacturers, in many parts of the country, still have the first mover's advantage to grab and capture new patrons. The biggest competitiveness in this product is its well-known health benefits to the world. With the evolution of many herbal companies, in recent years the naturopathy industry has boomed bringing in many people to acknowledge the virtuousness of herbs in consumption and application.

Overview of M/s Vijaya Durga Wine Industry and Storage Tank

Aonla wine has many extended uses than regular wine. It is rich in vitamin C and antioxidants. It claims to be a sleep tonic for people suffering from stress and insomnia. It spoils the customers with many choices of flavours such as pineapple, grape, dolce etc. Also, aonla wine is incredibly competitive in terms of pricing. The price ranges from Rs. 300.00 to Rs. 850.00 per litre of bottle making it an affordable option for wine drinkers.

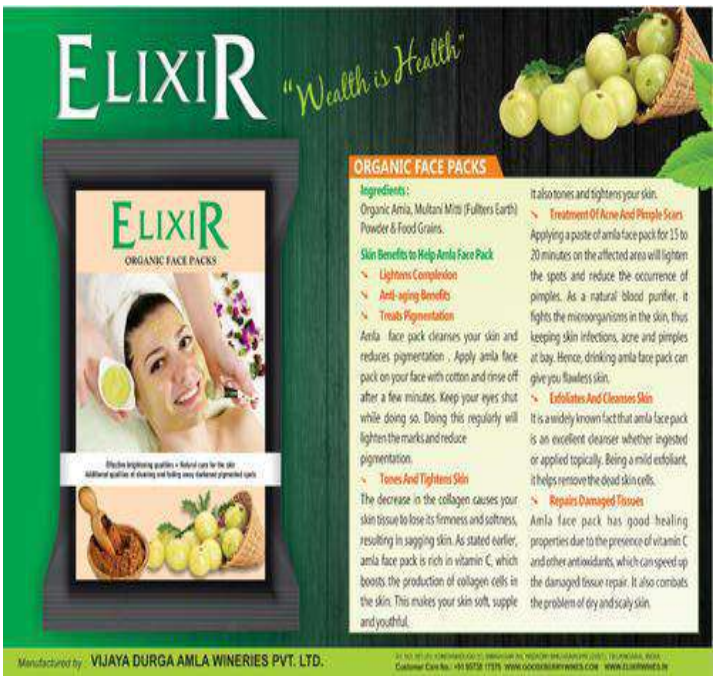
Marketing Strategy

The biggest challenge for this product is marketing it while protecting its product differentiation. Being an alcoholic beverage it cannot place itself as a health drink; hence the promotional activities are analogous to other liquor drinks. Malt brands generally refuge to surrogate advertising where their product brand is advertised on television as music CD or sparkling water without mentioning its alcohol content. The next segment will give the readers a better perception and unique approaches to endorse Aonla wine.

14.7 Advertising Techniques for Aonla Wine

A major advantage of this product is its added therapeutic benefits. But being an alcoholic beverage it cannot promote itself as a health drink in conventional media. The marketing head of a leading winery in Hyderabad reported that their advertising ropes only to print media and word of mouth. Pamphlets and brochures are rolled out and given to retailers and distributed during wine exhibitions around the country. Aonla wine needs to be promoted vigorously through various trade shows, exhibitions and also organising wine tourism for foreign travellers.

The Indian wine academy, a private organization based in New Delhi is coveted to the promotion of wine throughout the world. It publishes country's first wine newsletter and reaches to 33000 subscribers in 70 countries across the globe. The subscribers include producers, importers and exporters, retail heads, hospitality stakeholders, and hotel management institutes. This kind of platform is very necessary for Aonla wine producers to market its various brands and make a footprint in the wine industry.



An innovative way to stimulate Aonla wine is through its by-products. After the juice extraction from aonla, the left over fibre can be dried and powdered to make face and hair packs. Elixir uses its brand name on the packages of these products and distribute them to many local retailers and supermarkets. This practice can be an additional revenue generator as well as a tacit policy for the company to sell its brand after making products like face pack, henna powder, coloured henna cone etc.

14.8 Farmers' gain through Aonla Wine

1. **Scope for increase in production**: The wine production has opened an entire new avenue for production and marketing of aonla. The demand will increase manifold in near future due to fast growth of wine industry nationally and internationally. To fetch the farmers a bigger benefit it is important to regulate the flow of aonla through proper channels and encourage farmers to adopt this crop at a larger space.
2. **Inclusion of farmer in higher value chain through cooperatives**: As mentioned above farmer gets a limited share in the entire value chain of wine production in present situation. The government must assist in creating cooperative for farmers to include them to higher value stages.
3. **Profitable use of arid land**: The biggest boon for Aonla growers is its ability to withstand drought and arid areas. It imparts an opportunity to turn such land into growing a profitable and well demanded crop.

14.9 Conclusion

the government than offering cheap liquor to check the menace

'Amla' wine ready for launch

N. Rahul
HYDERABAD

An entrepreneur in Telangana is all set to launch a plant for manufacturing a new variant as commercial production of the beverage using gooseberry (amla).

Gooseberry based wines are rare because the drink is otherwise generally made of grapes, apples, mangoes, pomegranates, pineapple and strawberry. Wines made of berries are, however, familiar in foreign countries but the medicinal values of Indian gooseberry are not found in them. It is in this context that A. Vijaya Bhaskar, who has promoted the plant with a capacity to produce eight lakh bulk litres annually, applied for patent rights of the product. Mr. Bhaskar gets supplies of gooseberry from his farms maintained by organic methods at Rapaka village of Armoor mandal in Nalgonda district and Turigonda village near Vayalpad in Chittoor district. The fruit is grown over 200 acres at both places.

It took three years for him to get the required licences from the Excise Department to start the unit after he initiated validation procedures in the laboratory of the Indian Institute of Chemical Technology here in 2009. The laborious process involving natural fermentation

A gooseberry farm. - PHOTO: SPECIAL ARRANGEMENT

of the fruit, ageing for five to six months which added to the value of wines and storage in temperatures of 10 to 15 degrees Celsius were finally reworked by the IICT in 2012.

The National Institute of Nutrition tested the wine for polyphenols and Vitamin C. The Excise Department rejected his applications for permissions prior to 2009 insisting on validation either by IICT of Mysore-based Central Food Technological Research Institute.

The wine is naturally fermented without added spirits and is to be brought out in three taste variations. In three months, he also hoped to launch grape wine in rose and red variants, according to Mr. Vijaya Bhaskar.

He explained that gooseberry is a fibre content fruit whose pulp is hydraulically pressed to get juice and ferment it with values of wines. The sugars within the juice get converted into alcohol, which was restricted to 10 per cent.

According to him, a major deterrent for the flourishing of the industry is that the value added tax on wines in Telangana is 150 per cent. The VAT on wines in Maharashtra and Goa is only 12 per cent. A senior excise official said the government will consider bringing down VAT to promote the drink. If the VAT is reduced on par with other States, Mr. Vijaya Bhaskar hoped that the price of the drink, which is Rs. 960 a bottle of 750 ML, could be pegged in the range of Rs 400 to 500.

The official also said the government would encourage grape cultivation that is spread over 3,000 to 4,000 acres near Shamshabad and Medchal here to give fillip to wine industry which went into the background after the exit of Golconda Wine that was once famous in Hyderabad.

THE GOVERNMENT WILL CONSIDER BRINGING DOWN VAT TO PROMOTE THE DRINK

SENIOR EXCISE OFFICIAL

The market study showed that the demand for Aonla will increase in future years. But only increase in production cannot change the present situation of cultivators. The series of middlemen and illegal traders (for wild Aonla) will gain through the process leaving the cultivators a meagre share in the value chain. To connect the growing wine industry with its producers better policies are required by respective state governments. The farmers should be given necessary trainings, awareness and subsidies to motivate them for growing more Aonla.

CHAPTER 15

CONSTRAINTS & CHALLENGES

Loading Unloading of Aonla and Ashwagandha

India has been boasting its vast indigenous knowledge and established herbal medical systems like Ayurveda, Unani and Siddha. India is known as the "Emporium of Medicinal plants" due to availability of several thousands of medicinal plants in the different bioclimatic zones. Medicinal plants continue to provide valuable therapeutic agents, both in modern medicine and in traditional systems of medicine. In India, approximately 70% of modern drug are discovered from natural resources and number of other synthetic analogues have been prepared from prototype compounds isolated from plants. It was reported that more than 60% of cancer drug available in market or in testing are based on natural products. Currently, about 80% of antimicrobial, immunosuppressive, cardiovascular, and anticancer drugs are derived from plant sources. More than 70% entities among 177 anticancer drugs approved are based on natural products or mimetic. About 25% prescription drug found globally are derived from plant sources, and nearly 121 such drugs entity are in use. Yet, it has not been able to satiate the needs of the market demands of drug and cosmetic industry. In the last decade, herbal industry has boomed paving optimism for future expansion through endorsing virtues of chemical free, zero side effects and natural ingredients in its products. Soon naturopathy has established itself as a newly discovered productiveness in the global market place. India too has been trying to have its footmark in this growing arcade but due to many constraints at various stages from farm to fork, it has failed to optimize its domestic as well as export demands. To promote herbal material, it is important to impart quality material, have enough clinical trials, advocate an efficient R&D department, have proper market infrastructure and communications, build enough capacity etc.

Telangana has separated from Andhra Pradesh very recently. With the segregation of the state, many challenges erupted at industrial and policy level. The

state now requires new reforms and funding to address the challenges. The unorganized nature of herbal sector has added more complexity than other commercial fraternities.

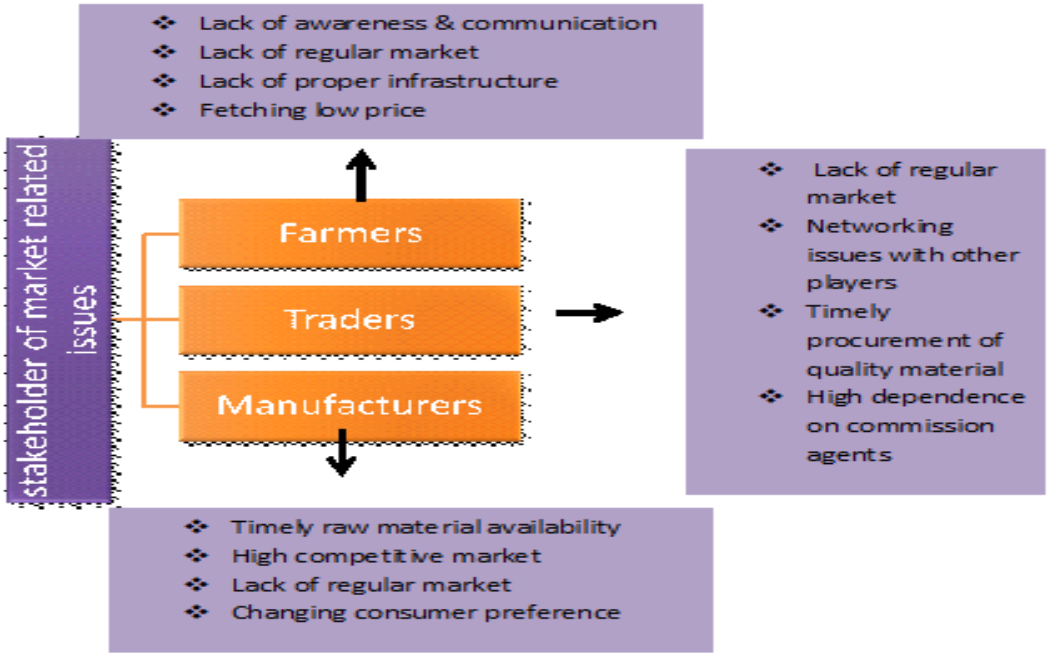
To explore the limitations at each stage of the value chain this section is divided into two parts:

- **Part- A:** discuss the issues in herbal industry and the produces of interest at a country level.
- **Part- B:** discuss the issues faced by the farmers of Telangana along with some issues in marketing their products.
- **Part- C:** explore the possible scope of improvement Telangana can adopt to curb some of the investigated issues.

15.1 PART A: Challenges and constraints of herbal industry in India

The major bottlenecks of the herbal industry in India are not limited to just one stage. The problems range from organization level to policy level. In fact, the nature of problems differs among nature of organizations. The list given below is a range of common issues faced by the herbal industry in India. The issues are listed categorically under different field of work and stage in the supply chain.

Market related bottlenecks: The market related problems are faced by three stakeholders in the value chain. Each stakeholder has been identified with some unique challenges. The challenges are:



Farmers: The farmers are the first player in the value chain. The farmers conduct most of the high-risk activities. The first issue identified is lack of awareness of the farmers about production techniques, markets, price and even farming technology. The availability of sources of communication and ICT is not focused on herbal produces yet. The farmers receive information about cereals and vegetables but they are not aware of the scope that herbal produces can impart in their income. Herbal drugs are very much dependent on production techniques, quality of seeds used and quality of the part to be used for making drugs. As a result, the low quality produce of the farmers do not get a proper market and they live in the dilemma that herbal produces do not bear any significant demand. The next issue in marketing is insufficient market infrastructure available at the farmer end. Farmers of herbal produces depend on buy back or contract farming due to its high perishability and lack of immediate selling point. There is a gap of storage facility and collection point at village level, and in case of a presence of a collection point the farmers are still forced to sell to the middlemen as these centres are unable to give them a competitive price. The unavailability of regular market is the major reason of low marketability of material at this stage of supply. The middlemen exploit the farmers by consuming a chunk of the share of value from them. These intermediaries establish relationship and trust with the farmers and price given by them is not validated by the producers through other sources. The result of low price lies in the deviation of production of bulk herbal material. Farmers find cash crops and cereals as constant source of income. On the other hand, herbal medicinal plants bear high risk of marketing.

Traders: The traders here are referred to the wholesale traders who sell bulk material to manufacturers or their agents. As mentioned in the above diagram traders' biggest challenge is to supply the material on time to manufacturers or retailers. Their good will in business mainly depends on punctuality and supply of desired grade of material.

Small Traders of Ashwagandha at Neemuch

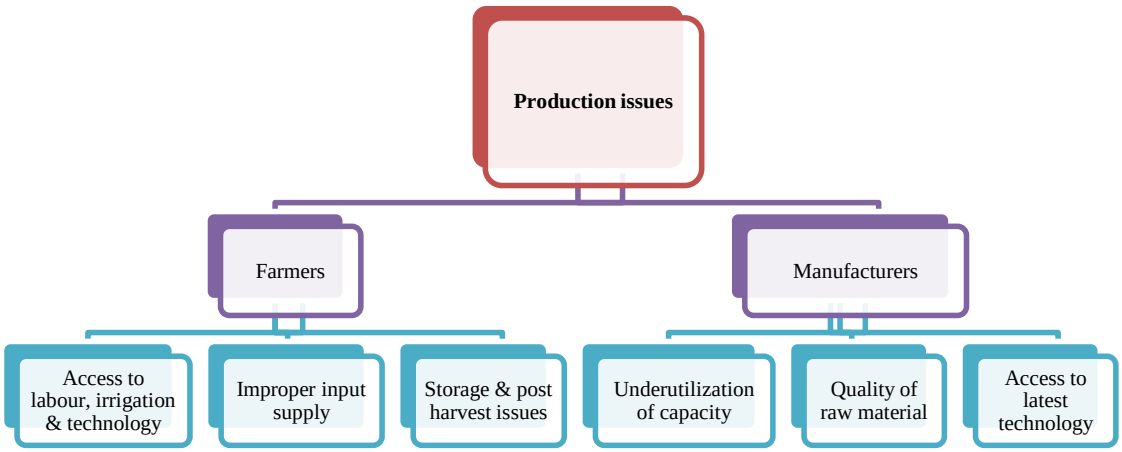
The lack of a regular market thus prohibits them from choices of material and source. They largely depend on a number of commission agents who come to their wholesale office with sample of raw material and an offer price. These traders seldom prefer buying from farmers directly as the farmers cross sale their material to the agents if they get a better price or at an immature ripening stage. The commission agents on the other hand take the accountability of sure supply. The issue in this system is high reliance on a handful of individuals and blinded from the better opportunities of procurement.

Manufacturers: The medicinal plant market is flooded with micro and small-scale industries with a handful of industry giants. The small-scale companies have simple processing units and have their footprint in a limited geography. The small-scale industries face a very tough competition from international giants and perish eventually. They fail to compete at many levels like advertising, technology and new applications of any medicinal plant. In terms of supply chain it has been seen even industry giants as Dabur has reported that they fulfil their need of Aonla from their trusted agents working for them for a long time. The main reason is to retain timely supply of material for processing. The small players in the market depend on local sellers for procurement. Therefore, their procurement process lacks sufficient bargaining of material for quality as well as price.

A decade back, the consumers of herbal medicine and cosmetics were buyers who were willing to pay a small price for herbal creams and medicinal tonics. But in present scenario the propensity of consumption for these products have increased exponentially. Now, the high-end consumers are willing to pay for better quality products. Many companies offer luxury brands like forest essential and body shop for reaching to the high end users. On the other hand, the small-scale players sold their products at a minimal price with an entirely different target customer. A few years back when Patanjali entered in to this segment, it revolutionised the medicinal plant market by selling the products at a very competitive price and positioning itself as an Indian brand trusted for purity. The shock was faced by entire herbal industry. The clever advertising of Patanjali through free health camps and competitive advantage of being a non-profit organization lifted the company and the whole industry to a new level. The small-scale players felt major loss as their target customer was attacked heavily. Even companies that sold products at medium range like Himalaya, Lotus herbal, Dabur and Vaidyanath were struggling for its original share.

Production issues

There are mainly two players involved in production in the herbal value chain. The farmers and manufacturers or processors are involved in producing raw material and processing them respectively. Given below is a pictorial chart of the major issues faced by them.



Farmers: The cultivators of medicinal plants require special attention to the production farm due to its sensitivity towards superior quality of raw material. One of the major bottlenecks of our export is inadequate supply of premium-graded raw material. The trouble in production starts from lack of improper input supply. Farmers are unaware of high quality seeds that give better yield with higher amount of active ingredient. Other input supplies such as pesticides and fertilizers are either unavailable to them or unaffordable as return fetched is low.

Most of the medicinal herbs are either perishable or require some basic processing after harvesting. The farm level processing are done manually by the women or sold off to the agents without any processing. Storage is another major issue as it leads to distress sale of raw material. A detailed take on post-harvest issue is conferred while discussing Telangana specific issues.

Manufacturers: These are the processing units and they are involved in processing, packaging and transportation to retail houses or wholesalers. The major issues for in these units are underutilization of capacity and low access to technology. Herbal fruits are seasonal and thus the processing units stay idle for six months. The utilization is halved for almost all scale of organizations. Especially the micro level

players who lack storage capability find it difficult to maximize their utilization and as a result, production is hampered. Low access to technology is another bottleneck for the manufacturers. The insight to technological importance is discussed in other part of the document.

Quality control issues

- Supply of medicinal herb found in NTFP are made by agents who lack adequate knowledge of medicinal plants. These agents organize collection of medicinal plants through children and women in these forest areas who many times cannot differentiate between related plant species. Therefore many times manufacturing units receive substituted or adulterated plant materials. The problem gets further aggravated since most of the Ayurvedic medicines Manufacturers do not have stringent methods of Quality Controls for these plant materials.
- Further, confusion occurs many a times due to vernacular/local names by which the traders supply. It is a known fact that local names of several medicinal plants have different botanical identity in the region of their occurrence.
- Another major problem faced is of non-homogeneity of the materials. Many times collection is done from different regions with the result that there is no homogeneity of these materials both in their organoleptic characters as well as in chemical constituents. Several times a mixture of mature and immature plant species are received which is difficult to separate. Pharmacognostic evaluation thus becomes difficult. Microscopic examination of several samples and that too in dried condition of broken plant part is very difficult and not practical method of quality control testing.

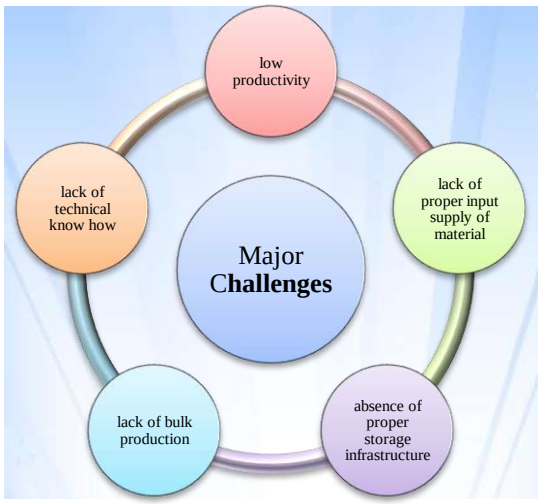
Other issues

- *Administrative issues*: Lack of regulation and controlling authority in herbal sector, lack of proper monitoring and controlling are absolute need for the quality of drugs.
- *Infrastructure related issue*: Lack of processing technique, trained personal, sophisticated instrument, utilization of modern techniques, facility to fabricate instrument locally are the major problems.

- *Pharmacogivilane*: Proper pharmacogivilane in herbal sector is the need of time to find the toxicological data and adverse drug reaction of herbal drugs. Adverse reactions, contraindications, interactions with other drug, food and existing orthodox pharmaceuticals need to be monitor properly.
- *Clinical trial*: Since the safety continues to be a foremost issue with the use of herbal remedies therefore, clinical trials are necessary to understand the safety and efficacy of these drugs before introduced them in global market.
- *IPR and bio-piracy*: Bio-piracy is the major difficulty in promotion of herbal traditional medicine. Documentation of folk knowledge thus important for our future.
- *Irrational use*: It is generally believed that herbal products don't have any side effects, interaction, but unfortunately is not true. Thus, irrational practice of these drugs can lead to various problems, which can hinder the promotion of such drugs.
- *R&D*: Research and development on dosage, processing, techniques are the key need for any drug, but in herbal sector, it is quite less compare to allopathic medicine. Although in recent years, the trend is changing. Research to understand the mode of action and pharmacokinetics phenomenon, improvement/creation of monographs and reference standards for marker-based analysis are necessary of time. Decisive gap in current ethnopharmacological and modern medicinal plant research is another problem for sustainable, socio-culturally equitable and safe supply of herbal medicines.

15.2 Part B: Constraints & challenges in Telangana

The herbal sector concerning aloe-vera, aonla and ashwagandha of Telangana is facing a number of challenges, which results in poor contribution of the state in this segment. The sector is constrained by low productivity, high cost of production, lack of post-harvest infrastructure resulting in huge post-harvest losses, inefficient &fragmented supply chain, lack of knowledge and poor market access.



The following are the main issues of the state in herbal sector, that need to be addressed in order to improve the production and market potential of the produce which in turn will help farming community get better income.

Existing gap in Production

1. The productivity of cultivated Aonla, Aloe vera and Ashwagandha is low in the state. The area of cultivation is way below to have any significant contribution in fulfilling the market needs.
2. Most of the farmers are dominantly practicing traditional farming system owing to ignorance about improved package of practices.
3. Inadequate irrigation facility and water storage infrastructure
4. Farm machinery and implements are yet to become popular for the farmers
5. Unavailability of skilled labour.

Post harvesting and marketing

1. Farmers are not trained to carry out sorting and grading of the concerned produces. The aonla producers sell their material in bulk right after production in fear of getting perished. The ashwagandha cultivators are unaware of how to segregate the roots according to the grading system of the market.
2. Non-availability of adequate post-harvest handling facilities in the production clusters and markets
3. Traditional system of deseeding of aonla and drying of aonla and aloe-vera leaves.
4. Lack of market access
5. Inadequate cold chain facility
6. Inadequate storage facility
7. Unavailability of regulated/organized market
8. Poor market infrastructure

Processing unit

Absence of local processing unit for aloe-vera, aonla and ashwagandha in the districts of Telangana

On the growers' side, the challenges include inability to make investments in packing material, infrastructure and flexibility regarding the timing of selling and choice of buyer or village level aggregator. Therefore, the state is unable to meet the market demand for their produces in export as well as domestic destinations. For many

commercial players of the value chain such as exporters, big traders, large manufacturers, the prospect of working with a large number of small farmers raises concerns about communication, management, and quality, reliability of supply and transaction costs.

15.3 Part C: Recommendations for Telangana

By exploring different opportunities and challenges, better marketing strategies will be executed. The suggestions are as follows:

Production:

1. **Capacity building:** Capacity building of farmers on improved production technologies and better farming practices: Farmers are unaware of the techniques and good agricultural practices of medicinal plants. They lack knowledge about production requirement required in the drug industry. For addressing the issue, demonstration plots should be created at block level to show case better production methodologies.
2. **Replacement of low yielding varieties:** Many farmers in Telangana depends on the middlemen and local shops to procure seeds and other input supply. As a result, they land up using inferior quality seeds giving low yield. The better varieties of seeds should be made available to the growers at a competitive price.
3. **Establishment of accredited nurseries for production of organic medicinal planting material:** The medicinal plant requires to be organically produced to meet the requirements of neutraceutical as well as medicinal markets. Also it enhances the chances of export in other countries. Availability of disease free organic material should be available through a model organic nursery in each district producing medicinal plants in bulk.
4. **Development of skilled man power:** Fast changing scenario of medicinal plant cultivation demands skilled technical manpower in the production land. This manpower should have knowledge and skills about farm machineries, post-harvest equipment, input supply sources, and seed variety. To achieve the same the state should promote skill development through various training programmes. The trainings should invoke programmes on crop planning, tools and machineries, soil biology, composting, business planning and marketing, business development plans.

Post-Harvest and Marketing

1. During the interaction with traders and farmers it has been found that farmers are mainly expected to carry out grading, cleaning and sorting. In case of Aonla the farmers deseed and dry the fresh Aonla before bringing in to the market. Due to lack of awareness the farmers are unable to perform these tasks efficiently. Therefore, they need to be trained on proper post-harvest techniques.
2. **Post-harvest infrastructure in the production cluster:** Medicinal plants undergo a series of operations after harvesting such as cleaning, sorting, grading, drying, winnowing, bagging, storage etc. before they reach the traders or consumers. There are appreciable losses in these stages. The existing gap in infrastructure results in inefficient market operations and high transaction costs. Multiple handling by various players in the fragmented supply chain and lack of warehouse & cold storage facilities also result in high post-harvest losses. It is therefore necessary to put in infrastructural facility in the production area.
3. **Introduction of modern/ integrated pack houses:** For carrying out post-harvest activities for bulk production it is recommended to introduce pack houses in the state. The pack houses will have a receiving area for offloading and weighing. It will have cleaning equipment and mechanized rollers for sorting, mechanized washing/drying.
4. **Establishment of bio fertilizer and bio pesticide units:** In medicinal plant production bio pesticide & bio fertilizers assume great significance. Each and every unit of production should receive them at competitive prices.
5. **Market intelligence system:** marketing information helps farmers to optimize their marketing decisions of where to sell, when to sell and at what price to sell. Currently, the medicinal commodities information can be found in e- Charak and medicinal plant WhatsApp groups. These needs to reach the farmers, who are unaware of these facilities. The daily price of all medicinal commodity market wise should reach the farmers. For the same farmers need to be registered in medicinal farmers group.
6. **Establishment of collection centres and terminal markets:** There is no regulated and organized market in Telangana for medicinal plant produces which results in unhealthy and unscrupulous practices reducing market charges and providing facilities to the stakeholders. This at times results in short weighment, excessive market charges, unauthorized deduction, adulteration of

produce etc. It is therefore suggested to establish regulated/organized markets with necessary infrastructure and facilities.

7. **E-auction centre:** E auctioning provides a platform for remotely located farmers to connect with major markets of the country.
8. **Brand enhancement of GCC and establishment as a wild aonla processing unit:** GCC has a huge untapped potential that can be achieved through proper management and business strategy. GCC needs to improve its brand image in the neutraceutical industry. It needs to focus on different area of marketing and promote itself as a trustworthy competitive company. GCC must provide comprehensive technology to the farmers and wild collectors. Telangana should have its own processing unit of GCC.
9. **Enhancing farmer's income through forward linkage:** The role of the farmers needs to strengthen through forward linkage. The farmers can receive a better price of aloe-vera if it can sell after processing. Such infrastructure needs to be established at production site. This can be feasible only if production takes place in huge quantity. Therefore, it is important to create clusters of production in each district for a particular produce according to farmers' interest and soil suitability.
10. **Centre for clinical trials and research laboratory:** A centre for carrying out research on medicinal produces needs to be created at the capital city of Telangana. The centre will have research clinical laboratories, documentation centre, conduct research on marketing and develop ICT facilities.

Marketing Strategies for Aonla, Ashwagandha and Aloe-vera

There is an urgent need for the development of an appropriate Marketing Strategy. Few of the suggestions are as follow:

(1) Looking to the increasing demand of the Aonla, Ashwagandha and Aloe-vera there is a need of its promotion of cultivation.

(2) There is a need of minimising the intermediaries to benefit the farmers since their margin is quite low. A Cooperative Herbal Bank may be formed where the farm produces may be submitted by the farmers and directly sold to the Manufacturers. Such herbal banks should be provided in all the potential districts.

(3) Regular Exhibition needs to be organised to showcase their produce by the farmers directly to the Manufacturers.

(4) Extraction unit on the cooperative basis should be established to add value in the farmers produces.

(5) Herbs processing industry should be promoted to ensure the consistent demand of the various herbs.

(6) The product quality is an important phenomenon in herbal products marketing. So all sort of technical quality control facility should be provided through the Krishi Vigyan Kendra.

(7) An online portal should be created by the Central Government or State Government where all the database of the Cultivators should be kept which helps removing the mediators and give them a right price.

(8) The major issue before the marketing is the Logistic support. It needs to be revisited and created. Without infrastructure the marketing would be difficult.

(9) A Central Database is needed covering all the cultivators, manufacturers, exporters and buyers.

(10) Soft loans should be provided to the herbal cultivators.

Recommendation

The recommendation for each type of existing gap is given throughout the report under each topic and chapter. However, conclusive recommendation highlighting some major steps necessary to be taken for enhancing the marketability of produce of aloe-vera, aonla and ashwagandha is summarized in this part of the report.

Suggestions

To execute the better marketing strategy for medicinal and aromatic plants in general and aloe-vera, aonla, and ashwagandha in particular, some suggestion for betterment of the industry are to strengthen marketing opportunity are given as under.

Production:

1. **Capacity building of farmers on improved production technologies and better farming practices:** Farmers are unaware of the techniques and good agricultural practices of medicinal plants. They lack of knowledge about production requirement required in the drug industry. For addressing the issue, demonstration plots should be created at block level to show case better

production methodologies to produce good quality of raw material for the industry.

2. **Replacement of low yielding varieties:** Many farmers in Telangana depends on the middlemen and local shops to procure seeds and other input supply. As a result, they land up using inferior quality seeds giving low yield and poor quality of raw material. The improved varieties of seeds should be made available to the growers at a competitive price.
3. **Establishment of accredited nurseries for production of organic medicinal planting material:** The medicinal plant requires to be organically produced to meet the requirements of neutraceuticals as well as medicinal markets. Also it enhances the chances of export in other countries. Availability of disease free organic material should be available through a model organic nursery in each district producing medicinal plants in bulk.
4. **Development of skilled man power:** Fast changing scenario of medicinal plant cultivation demands skilled technical manpower in the production land. This manpower should have knowledge and skills about farm machineries, post-harvest equipment, input supply sources, and seed variety. To achieve the same the state should promote skill development through various training programmes. The trainings should invoke programmes on crop planning, tools and machineries, soil biology, composting, business planning and marketing, business development plans.

Post-harvest and marketing

1. During the interaction with traders and farmers it has been found that farmers are mainly expected to carry out grading, cleaning and sorting. In case of aonla the farmers deseed and dry the fresh aonla before bringing in to the market. Due to lack of awareness the farmers are unable to perform these tasks efficiently. Therefore, they need to be trained on proper post-harvest techniques.

2. **Post-harvest infrastructure in the production cluster:** Medicinal plants undergo a series of operations after harvesting such as cleaning, sorting, grading, drying, winnowing, bagging, storage etc. before they reach the traders or consumers. There are appreciable losses in these stages. The existing gap in infrastructure results in inefficient market operations and high transaction costs. Multiple handling by various players in the fragmented supply chain and lack of

warehouse & cold storage facilities also result in high post-harvest losses. It is therefore necessary to put in infrastructural facility in the production area.

3. **Introduction of modern/ integrated pack houses:** For carrying out post-harvest activities for bulk production it is recommended to introduce pack houses in the state. The pack houses will have a receiving area for offloading and weighing. It will have cleaning equipment and mechanized rollers for sorting, mechanized washing/drying.
4. **Establishment of bio fertilizer and bio pesticide units:** In medicinal plant production bio pesticide & bio fertilizers assume great significance. Each and every unit of production should receive them at competitive prices.
5. **Market intelligence system:** Marketing information helps farmers to optimize their marketing decisions of where to sell, when to sell and at what price to sell and whom to sell. Currently, the medicinal commodities information can be found in E-Charak and medicinal plant WhatsApp groups. These needs to reach the farmers, who are unaware of these facilities. The daily price of all medicinal commodity market wise should reach the farmers. For the same farmers need to be registered in medicinal farmers group.
6. **Establishment of collection centres and terminal markets:** There is no regulated and organized market in Telangana for medicinal plant produces which results in unhealthy and unscrupulous practices reducing market charges and providing facilities to the stakeholders. This results in short weighment, excessive market charges, unauthorized deduction, adulteration of produce etc. It is therefore suggested to establish regulated/organized markets with necessary infrastructure and facilities for sell -purchase of medicinal plant products.
7. **E-auction centre:** E auctioning provides a platform for remotely located farmers to connect with major markets of the country in a fair manner where farmers can sell their produce without coming under pressure of the middlemen and avoid distress sell of commodity.
8. **Brand enhancement of GCC and establishment as a wild aonla processing unit:** GCC has a huge untapped potential that can be achieved through proper management and business strategy. GCC needs to improve its brand image in the neutraceutical industry. It needs to focus on different area of marketing and promote itself as a trustworthy competitive company. GCC must provide

comprehensive technology to the farmers and wild collectors. Telangana should have its own processing unit of GCC.

9. **Enhancing farmers income through forward linkage:** The role of the farmers needs to strengthen through forward linkage so that they could tap the opportunity in better marketing of produce. The farmers can receive a better price of aloe-vera if it can sell after processing. Such infrastructure needs to be established at production site. This can be feasible only if production takes place in huge quantity. Therefore, it is important to create clusters of production in each district for a particular produce according to farmers' interest and soil suitability and presence of the industry.
10. **Centre for clinical trials and research laboratory:** A centre for carrying out research on medicinal produces needs to be created at the capital city of Telangana. The centre will have research clinical laboratories, documentation centre, conduct research on marketing, and develop ICT facilities. And, mechanism to provide information to the stakeholders in time.

Recommendation on production, quality and certifications

1. This section of the report imparts necessary suggestions on cultivation practices of ashwagandha, aloe-vera and aonla in the state of Telangana. The following table will give the year wise cultivation of aonla, aloe-vera and ashwagandha in the state of Telangana. The table given below shows trend of cultivation of the three produces in last 4 years.

Table 41: Cultivation trend of Aloe-vera

Aloe-vera		
Year	**Total cultivated area in ha**	**Number of farmers**
2016-17	84.1	14
2015-16	13.32	6
2014-15	3	3
2013-14	5.4	8

Table 42: Cultivation trend of Aonla

Aonla		
Year	**Total cultivated area in ha**	**Number of farmers**
2016-17	No data found	No data found
2015-16	2.52	5
2014-15	4	3
2013-14	5.6	4

Table 43: Cultivation trend of Ashwagandha

Ashwagandha		
Year	**Total cultivated area**	**Number of farmers**
2016-17	505	191
2015-16	85.62	84
2014-15	112.8	42
2013-14	44.94	68

2. The above table shows that the cultivation of ashwagandha has been more optimistic than the other two produces. The highest number of producers in aloe-vera is 14, for aonla it is 5 and for ashwagandha it is 191. It can be concluded that aloe-vera and aonla is rarely produced in the state and thus the focus should be to increase the production area at present. On the other hand ashwagandha is produced by a large number of farmers, in more than 500 acres. Therefore there is a scope of processing intervention of ashwagandha in the state. But before reaching such results let us see if it is feasible by comparing the yield, price and other aspects of production.

Name of produce	**Seed quantity required for one acre**	**Harvesting period**	**Yield (kg/acre)**
Ashwagandha	7-8 kg	5-6 months	200-300
Aloe-vera	-	After one year	25-30 (average of 1st and second year)
Aonla	Saplings are used instead of seeds	After three years	6600 (from 3rd to 6th year)

3. From the above tables it is concluded that the total production of the three produces in the state of Telangana. The average yield is multiplied with the cultivated land after adjusting the units, to predict the total cultivated production.

Average production of produces of interest			
Name of produce	**Yield**	**Area**	**Production in kg**
Ashwagandha	200	1247.88	249576
Aloe-vera	22.5	207.81	4675.72
Aonla	6600	6.22	41052

4. The production table depicts that all three produces are in sufficient quantity for in- state processing but ashwagandha is considered a major herbal produce in the state. It should be noted that production of all three produces are way below compared to other states of India in terms of quantity as well as yield. For competing with other states, Telangana must use high yield variety as expand the land of production.
5. The next issue in commercial production is certifications and presence of active constituents in the raw material. The previous parts of the report showed how India relies on high priced import raw material for medicinal and neuropathic use when the home grown crops gets sold at a minute amount. It is therefore necessary to focus on the techniques and certifications of production as much as quantity of production, because for herbal production the challenge is not limited to its food value but also the medicinal properties of each produce.
6. As at present, Telangana has a bulk production of ashwagandha, we will be discussing the required techniques, amount of constituent profile and certifications needed for best value sale of the matter. The data of renowned company named “KSM 66” has been used as a case profile to understand the necessities and market demand in quality production of ashwagandha. Before moving further let us know about this organization so that the recommendation on the mentioned factors can be rationalized.
7. KSM-66 is an ashwagandha extract made by Ixoreal Biomed, created via a process that took 14 years of R&D to develop and refine. KSM-66 is the highest-concentration extract on the world market today that is drawn using only the roots of the ashwagandha plant. It is produced using the first-of-its-

kind extraction process, based on "Green-Chemistry" principles, without using alcohol or any other chemical solvents.

8. KSM-66 Ashwagandha's substantiated structure/function claims for its psychological and physiological wellness benefits are in accordance with the requirements of the Dietary Supplement Health and Education Act of 1994. Backed by several randomized, double-blind, placebo controlled human clinical trials, following are some examples of claims that KSM-66 Ashwagandha features:

Helps promote a healthy response to everyday stress, over-work and fatigue.

- Helps support normal levels of mental clarity, concentration and alertness.
- Helps support normal levels of vigour and performance.
- Helps enhance sports performance

Now let us see the quality assurance techniques used by the best companies in the country.

Good agricultural and collection practices	• Well drained, sand loamy or light red soils with pH of 7.5-8.0. • Areas receiving 650-750 mm rainfall are used for its cultivation. • The roots of ashwagandha are cultivated organically. • No old root stock is used. • Only special or High A-grade root pieces are used for the extraction. These roots are solid and bright, up to 7 centimetre, approximately and with a diameter of 1 to 1.5 centimetres.
Good laboratory practices	• Quality on the farm • Quality on receiving the raw material • In-house laboratory testing and segregation of raw material, • Organoleptic testing • Moisture content analysis • Microscopy and petri-grid analysis • Microbiological testing • Ash testing • pH testing • Aflatoxin testing • Heavy metal analysis • Pesticide analysis

Good packaging practices	• Strict protocols are followed at every stage- from storing of raw herb to finished product. • Precise labelling and hygienic handling are ensured. • Packaging is done as per the Standard Exports Packaging policy.

The next table will show the major constituents level required to be present in the ashwagandha root that can be used for medicinal purpose.

Constituents	**Limit of content**
Moisture Content (% w/w)	< 5.0
Ash content (%W/W)	<8.0
Acid insoluble ash (%w/w)	<5.0
pH of 5%w/v solution	4.0 – 6.5
Heavy metals	< 1 ppm (approx.)
Total Withanolides (%w/w)	>5%
(Withaferin A)	<0.1 %

Necessary certifications

The next few pages will discuss the certifications embraced by the major players of herbal industry. The significance of this discussion is that production alone cannot ensure upgradation in value of the herbal produces. To take it forward in the market with high value addition the production site must be certified by various competent authorities. One of the major hindrance in export market is lack of certifications required for destination nations and low clinical research on product. Therefore major ashwagandha industries like KSM 66, natural remedies and Himalaya drugs have been studied and below is a sample of some of the most important certifications that these companies adhere to while exporting:

1. **NSF certification:** Choosing a product certified by NSF lets you know the company complies with strict standards and procedures imposed by NSF. From extensive product testing and material analyses to unannounced plant inspections, every aspect of a product's development is thoroughly evaluated before it can earn certification. Most importantly, NSF certification is not a one-time event, but involves regular on-site inspections of manufacturing facilities and regular re-testing of products to ensure that they continue to meet the same high standards required to maintain certification over time. If for any reason a

product fails to meet one or more certification criteria, NSF will take enforcement actions to protect you, including product recall, public notification or de-certification.

2. **USDA certification:** Organic Certification allows a farm or processing facility to sell, label, and represent their products as organic. The organic brand provides consumers with more choices in the marketplace. The USDA protects consumer options by protecting the organic seal. Any organic operation violating the USDA organic regulations faces enforcement actions, which can include financial penalties or suspension/revocation of their organic certificate.
3. **GMP certification:** Good Manufacturing Practice (GMP) is a system for ensuring that products are consistently produced and controlled according to quality standards. It is designed to minimize the risks involved in any pharmaceutical production that cannot be eliminated through testing the final product. The main risks are: unexpected contamination of products, causing damage to health or even death; incorrect labels on containers, which could mean that patients receive the wrong medicine; insufficient or too much active ingredient, resulting in ineffective treatment or adverse effects. GMP covers all aspects of production; from the starting materials, premises and equipment to the training and personal hygiene of staff. Detailed, written procedures are essential for each process that could affect the quality of the finished product. There must be systems to provide documented proof that correct procedures are consistently followed at each step in the manufacturing process - every time a product is made. WHO has established detailed guidelines for good manufacturing practice. Many countries have formulated their own requirements for GMP based on WHO GMP. Others have harmonized their requirements, for example in the Association of South-East Asian Nations (ASEAN), in the European Union and through the Pharmaceutical Inspection Convention.
4. **UL certification:** UL Standards encompass UL's extensive safety research and scientific expertise. With over a century of experience in the development of more than 1,500 Standards, UL is an accredited standards developer in the US and Canada. In extending its global public safety mission, UL Standards partners with national standards bodies in countries around the world to build a safer, more sustainable world.

5. **NON GMO CERTIFICATION:** From the seed, through the growing process and harvest, transportation, collection, storing and processing to the market channel, it offer independent certification of the quality management systems. Certification also includes the verification of legal requirements relating to the labelling and traceability of GMOs.

   Based on EU regulations concerning non-GMO, including Directive 2001/18/EC and regulations 1829/2003 and 1830/2003, our standard can be applied to all processes in the supply chain like seed supply, farming, trading and processing and also to the supply chain like storage, transport and sampling and analysis

6. BSCG CERTIFICATION: BSCG offers a complete suite of dietary supplement certification and testing services. BSCG works with supplement brands, ingredient suppliers, manufacturing facilities, and individual teams and athletes to ensure the quality of dietary supplement products and ingredients and protect against contamination with drugs or other agents that can lead to health concerns or positive drug tests.
7. ISO9001: SO 9001:2015 sets out the criteria for a quality management system and is the only standard in the family that can be certified to (although this is not a requirement). It can be used by any organization, large or small, regardless of its field of activity. In fact, there are over one million companies and organizations in over 170 countries certified to ISO 9001.

Evaluation of extracts

The pure and natural herbal drugs and its products are very effective for cure of body, however, there is a chance for adulteration in the material. Before using the raw drugs and its formulation it is important to check the quality parameters of the products. In this section of report is describe that how to evaluate the extracts of the produces. This list of evaluation parameters must be trained to all producers so that the best quality is ensured at the production site.

1. **Checking purity of extract:** There are some ashwagandha manufactures who make the extract using the plant's leaves rather than by using roots of plant. However, only the roots with no adulteration by leaves must be used. This is because, for maximum clinical effectiveness, the ashwagandha extract is conceptualized primarily as a root extract, not only in ayurveda textbooks, but

also in the standard references like the Indian, the British and the U.S. Pharmacopoeias (their specifications are based entirely on the root, the leaf appears nowhere). There is a large number of studies documented in PubMed and conducted by universities and research hospitals, virtually all of which use root-only extracts and no leaves. While there are numerous human clinical studies using the root extract, pretty much the only clinical evidence for a root+leaf extract is from research sponsored by such extracts' manufacturers themselves. Moreover, the extracts containing leaves have so little safety and efficacy data supporting them that many European countries' regulatory authorities explicitly disapprove extracts with leaves and allow solely root-only extracts.

2. **Check authenticity of clinical studies:** PubMed is an index, maintained by the U. S. Government's National Library of Medicine, of articles published in what academics consider to be high-quality biomedical journals. Journals not indexed in PubMed are considered to be of a distinctly lower tier than Pubmed-indexed journals.

3. **Authenticity of end products:** This point is focused only for large producers cum manufacturers. The clinical trials are a common phenomenon in the field of herbal medicines and carried out by many Indian herbal manufacturers. Some ashwagandha manufactures' clinical studies try to show the effectiveness of their ashwagandha by demonstrating improvement in clinically compromised populations or otherwise less than fully healthy populations.

4. **Availability of withaferin:** Not all withanolides are beneficial. Withaferin A is one withanolide which is cytotoxic, as has been established in multiple scientific studies. So, it is undesirable to have Withaferin A in an ashwagandha extract when the intended use is for classical applications like building anti-stress ability, energy, cognition and immunity. Some ashwagandha extracts have high levels of Withaferin A because the manufacturers use ashwagandha leaves. Using leaves spikes up the overall withanolide content, but it also brings in the undesirable withanolide 'Withaferin A'.

Farmers' integration to higher value chain

It has been observed that majority of small and marginal farmers are growing ashwagandha, aonla and aloe-vera are in Telangana state. As a result they are exposed

many types of exploitation which ultimately lowers the farmers' share in consumer price. The major bottlenecks are being discussed in the previous sections and this section will try to recommend a few techniques to increase the value of farmers in the value chain of ashwagandha, aloe vera and aonla trade.

Formation of Farmer Producer Organization in the state

The farmers cultivating produces of interest are now working either individually or in small cluster groups. Such scenario is limiting them from facing many demands of the industry like bulk quantity of produce, processed material supply and two way communication among the different stakeholders. A farmer producer company in the state can ensure the involvement of farmers in the end to end process in the value chain enabling them to provide bargaining powers and compete in the trade of their produce.

About FPO

A Producer Organisation (PO) is a legal entity formed by primary producers, viz. farmers, milk producers, fishermen, weavers, rural artisans, craftsmen. A PO can be a producer company, a cooperative society or any other legal form which provides for sharing of profits/benefits among the members. In some forms like producer companies, institutions of primary producers can also become member of PO. A farmer producer company is a type of a PO where the members are farmers. This type of frame work can be created in the state to strengthen the farmers group so that farmers can get remunerative price of agri-produce.

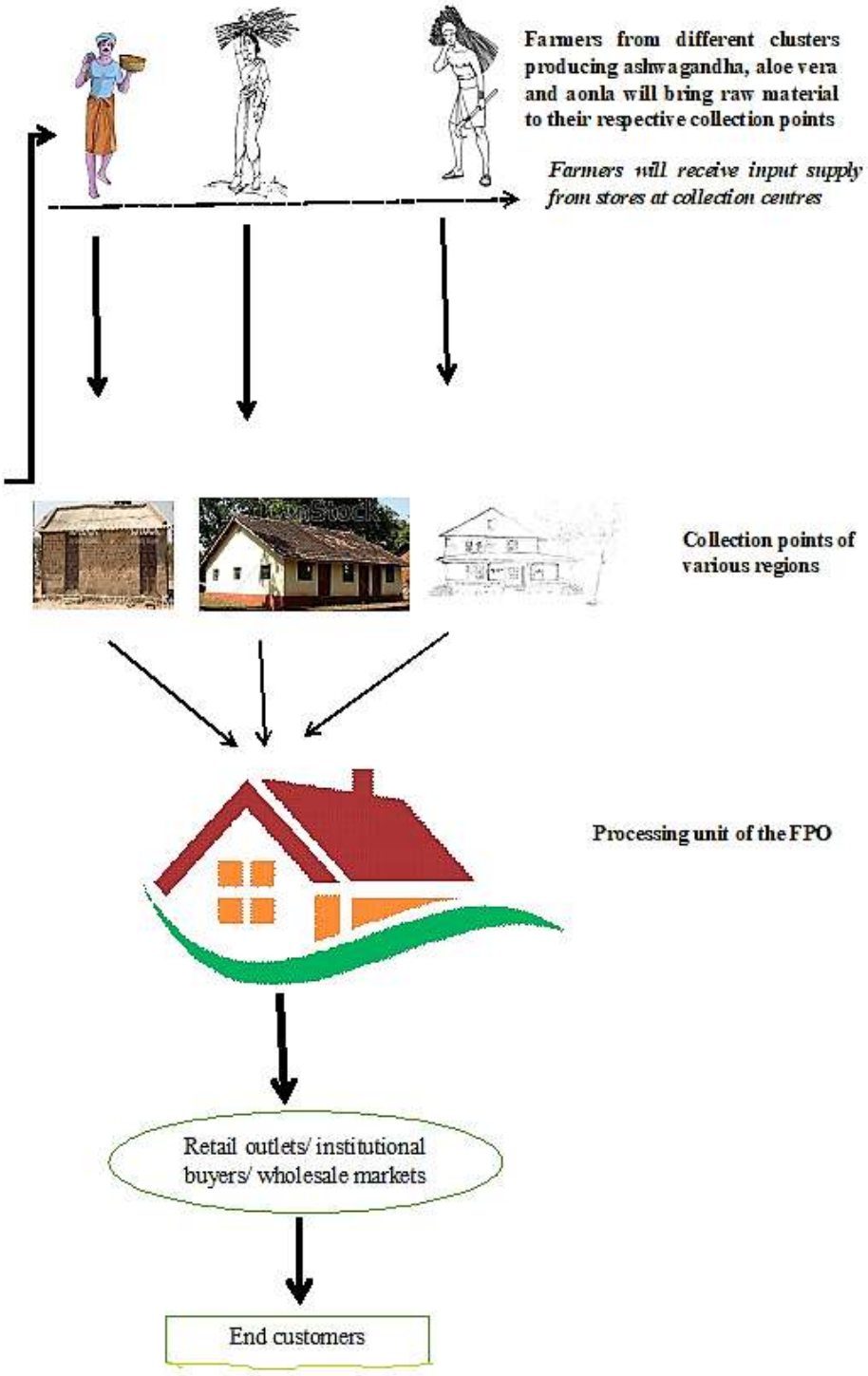
How FPO can help

The role of Farmer Producer Organization is to transfer individual farmer risk to a collective entity and giving better price of raw material as the middlemen will be removed from the value chain. For individual farmer it is very difficult to bargain with big players of the market. Minuscule and scattered production is problem in the state. If farmers can come in to group will be powerful in comparison to one. Following things also can be ensured in group

1. Supply of quality input to the farmers
2. Bulk purchase from individual farmers
3. Processing, packaging, brand building, standardization of products
4. Facilitating finance for input
5. Aggregation and storage of produce

6. Drying, cleaning, grading
7. Quality control
8. Marketing to buyers
9. Assessing technology and innovation

Given below is a flow chart of how the farmer producer organization will function in the state.



The first step is to form the clusters and collection points for the organization. The location for collection point should be chosen where maximum amount of collection can be done. To carry out the same we need to look at the major production points in crop producing districts of Telangana.

Given below is a table depicting a district wise distribution of farmers for each interest of produce:

	Number of farmers		
Name of district	**Ashwagandha**	**Aloe-vera**	**Aonla**
Ranga Reddy	22	12	3
Siddipet	5	0	0
Jogulamba gadwal	76	0	0
Khamam	24	0	0
Nalgonda	0	150 (approx.)	4
Medak	25	3	4
Mehbubnagar	95	0	5
Warrangal	0	5	0

The above table shows that ashwagandha is distributed more evenly than the other two crops. Aloe-vera production is concentrated in only one district and aonla is hardly cultivated. Thus, it can be said that at present FPO for only ashwagandha and aloe-vera should be structured. The reason is there is very less cultivated aonla and wild aonla is procured by GCC, which has been discussed in the previous chapters of the report.

The collection centre thus is given below as:

Name of produce	**Suggested site for construction of collection centres**
Ashwagandha	Mehbubnagar, Jogulamba, Gadwal
Aloe-vera	Nalgonda

Next, as farmers are the biggest stakeholders of this organization it is imperative to give them necessary trainings on different aspects like cultivation, procurement, grading, cleaning, packaging and storage so that they can understand the importance of

these activities. The training module can be created on various aspects discussed in the next few lines with the help of training organization like CCS NIAM, Jaipur. The various aspects of farmer training for FPO formation are as below:

- Awareness creation on FPO concept in target region (holding workshops, group discussion and meetings etc)
- Programs for extension support in terms of trainings on better crop production techniques, field demonstrations, exposure visit etc. to help them increase marketable surplus
- Trainings on institution building (record keeping, maintaining meeting registers, group cohesion aspects, group saving etc.). Such trainings must involve more number of women by forming self-help groups, village and cluster level federations.
- Training Programmes on selling of aggregated produce to help them realize the advantage of economy of scale. This should focus on imparting techniques to increase sale of herbal produces through understanding of networking process creating a brand value, marketing techniques of the produces. Training Programmes on responsibility of CEO, Board of Directors and others.
- Programmes on forward linkage integration, input supply business, value chain efficiency etc. should be given to the farmers.
- The processing unit of the FPO is the heart of the organization. It must have state of the art infrastructure, scope for research and development, favourable location and technology. The processing unit must keep a training centre where trainings at different time periods can be conducted. Industry experts of the produces of interest like KSM 66, Himalaya, Vaidyanath must be approached to give them better business insights.

Training requirements: In India various institutions are giving training to the stakeholder on different aspects of the subjects. Institutions should selected as per expertise having available with them. A list of institutions are giving below having area of expertise on various aspects.

Table 44: Training need assessment and Deliverable

S. No.	Training need	Trainer Institutions	Deliverable of the training
1	Good Agricultural Practices (GAP)	CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow	At the end of the training the farmers will gain knowledge scientific cultivation of the crops.
2	Training on Farmer Group or Self- Help Group in village level	SIRD/NIRD/ Social department of the state	The small farmers and the women will be skilled to run sustainable self-help groups.
3	Training on e-auction	IT expert individual from National Institute of Agricultural Marketing, Jaipur.	E-auction is a new concept for the farmers of Telangana. Hence necessary trainings will enable them to understand the importance and process of this system
4	FPO Management training	NIAM/ SERP	FPO management, as stated above, is a major step needed for farmer integration in forward linkage of value chain. As it is a business unit, it faces the challenges and processes of the commercial industry. After the training each management level will have a thorough understanding of the working of the FPO
5	Low Cost Processing training	Local manufacturing units of Kerala and Telangana	As the herbal market of Kerala is flooded with successful low cost small processing units, it can impart trainings for home based industries in the state. The training should focus on including women of the households.
6	Trainings on required certifications	CCS NIAM/ KSM66	The stakeholders need to know the different options for certifications for better demand of the produces.
7.	Training on Good Marketing Practices (GMP)	CCS NIAM, Jaipur	Trained them on demand driven production of the produces. Currently more than 50% of the produces do not meet the quality parameters of drug industry. Prepare farmers for better marketing and make them ready to face challenges

CHAPTER 16

QUESTIONNAIRE FOR STAKEHOLDERS

Annexures-1

QUESTIONNAIRE FOR FARMERS

Name of crop: ……..

Farmer's profile

1. Name of farmer: ……
2. Age: ……
3. Level of education……
4. Name of Village: …….
5. Name of District: ……
6. No of years in agriculture: ……
7. Family size: …….
8. Major occupation: …….
9. Income from agriculture Rs.: ……
10. Total annual income Rs. :……

Section- A

Factors responsible for production choice

The choice of production of crops is done on the basis of many factors and also amount of land holding. It focuses on farmers' perception and preference for choosing a produce. The table below shows the same and reflects what factors are important for them before choosing the crops.

1. Size of holding.

Factors	Land holding classification of farmers			Total
	Small farmers	Medium farmers	Large farmers	
High profit				
Water saving				
High yield				
High demand				
Regular income				
Intervention by institutions				
Low cost of production				
Near to market				
Easy access to input				
Family consumption				

Factors responsible for choosing produce

2. Cost analysis in production - Material Cost

SN	Particulars	Quantity	Frequency	Price	Value	Remarks
1.	Seeds					
2.	Seed treatment chemical					
3.	Chemical Fertilizer					
	a. DAP					
	b. Urea					
	c. NPK					
	d. Other complex					
	e. Others					
4.	FYM/Organic manure					
5.	Plant protection chemicals 1 2 3					
6.	Weed management					
7.	Irrigation cost					
8.	Electricity per month					
9.	Storage					
10.	Transportation					

3. Crop Sheet (cost of cultivation)/ha for labour

S. No.	Particulars	Human Labour		Machine Labour		Animal Labour	
		Applied in man hour	Cost	Applied	Cost	Applied	Cost
1.	Ploughing						
2.	Pre-irrigation						
3.	Harrowing						
4.	FYM a) Transportation b) Application						
5.	Sowing / Transplanting						
6.	Fertilizer application						
7.	Irrigation						
8.	Inter-culture						
9.	Weeding						
10.	Plant Protection measures						
11.	Harvesting						
12.	Transportation						
13.	Distillation charges						
14.	Marketing cost						
15.	Watch and ward						
16.	Miscellaneous						
Total Expenditure (Rs.)							

Wage rates (Rs/day): Male: _____ Female: _____

4. Input procurement

a. Type of seed

S. No.	Type of seed used	Yes	No	Price (Rs.)
1	Local seeds			
2	Hybrid seeds			
3	Foreign seeds			

b. Source for procurement of seeds

Procurement source	Store at home	From friends/neighbour on credit	Purchase from govt. agency	Purchase from any seeds shops	Purchase from private company	Exchange with other farmers	cooperative

c. General information about variety and area of particular crop:

Name of variety	Area in ha.	Cost per kg	Price per kg	Yield per ha.	Reason for production of this variety

5. Inventory of Land (Bigha)

Particulars	Total	Used for farming	Irrigated	Soil type
Owned				
Leased in				
Leased out				
Total				

Qs. **Is there any change in your farming land due to increase in price in last 5 years?**

A. Reduction in area

B. Increase in land

C. No change

6. Infrastructure availability of farmers

(i) **Which of the following means of irrigation are present in your area?**

a. Canal

b. Own pump/Bore/Boring/tube well

c. Pond

d. River

e. Water tank

f. Govt. tube well

g. Well

h. Sprinkle irrigation

i. ***Any other*** _____

(ii) **For how much of your agricultural land has irrigation facility?**

a. ***(In ha.)***_____ eg. 5 out of 10 acre

(iii) **In the last seven days, for how many hours did you get electricity for the following purposes?**

a. For Farming_____ ***(Hours)*** c. No electricity for farming

b. For Home_____***(Hours)*** d.. No electricity for home

(iv) **In order to receive uninterrupted electricity, if you were to pay more electricity bill than what you pay today, would you agree to it?**

A. Yes

B. No

C. Can't say

D. No electricity

(v) **Without electricity on what means of power do you depend upon for agricultural work?**

1. Use own generator/engine
2. Use rented generator/engine
3. Fully dependent on electricity
4. Rain
5. Canal
6. ***Other (Specify)***_____

(vi) **Generally which tool do you use for ploughing?**

a. Tractor

b. Plough

c. Both

d. My work does not require ploughing

e. Any other……

(vii) **In which of the following stages you use machinery:**

Name of the process	**Machinery used(yes/no)**	**Reason for the choice**	**Initial investment if answer to column 2 is yes**	**Operational investment per season**	**How much loss you estimate due to unavailability of machinery**
Sowing					
Ploughing					
Harvesting					
Post harvesting					

7. How do you store your produce?

a. Perishable items: …….

b. Non- perishable items: ……

8. Production and yield analysis

Season/ Crops	**Area (ha.)**	**Variety**	**Yield (ha.)**	**Soil type**	**Irrigation Source**
Kharif					
1					
2					
3					
4					
5					
Rabi					
1					
2					
3					
4					
5					
Zaid					
1					
2					
3					
Horticultural Crops					
1					
2					
3					

Section B

Post-harvest loss

The post-harvest loss can be in terms of quality as well as quantity. The table given below is a measure of quality loss after harvest. Economic loss can also occur if the produce is subsequently restricted to a lower value market. Here, food loss is a subset of PHL and represents the part of the edible share of food that is available for consumption at either the retail or consumer levels but not consumed for any reason.

1. (A)

Weight losses during traditional post-harvest chain					
Cutting handling	**Manual threshing**	**Sun drying**	**Open storage**	**Village milling**	**Small retailer**
Weight losses in mechanized post-harvest chain					
Combine harvesting	**Machine threshing**	**Mechanical drying**	**Sealed storage**	**Commercial milling**	**Large retailers**

The post -harvest loss happens at each stage after it is harvested from field. It is important to find at what stage the loss is maximum in terms of volume. The table given below thus shows the percentage of loss that happens at each stage.

(B)

Percentage of loss at each stage						
Name of Crop	**Harvesting**	**Transportation**	**Sorting**	**Unloading/ Unloading**	**Delay in sale**	**Poor handling**
Aloe-Vera						

Another factor that affects the quality of produce after harvest is its harvesting time. The maturity index for every crop is different. Premature harvesting results in poor quality of produce, and fruits left to ripen on the tree are often eaten by birds and bats, and when over-mature on tree, they have a tendency to break and decay.

Premature fruits also failed to ripen during storage. Therefore, maturity indices were standardized for increasing shelf life, proper ripening and reducing losses.

(C)

Maturity index	
Factors	**Degree of deviation**

Maturity index

Other questions on losses

2. How much crop is spoiled in last season?
   A. aloe vera…….
   B. aonla……..
   C. ashwagandha……

3. What was the **main reason** for destruction of the crop?***(Try to get one answer)***

1. Drought
2. Flood
3. Pest attack
4. More or less rain
5. Animal/ Bird Attack
6. Lack of electricity
7. Lack of irrigation facility
8. Hailstorm
9. Weather was very hot/cold
10. Unseasonal rain
11. ***Other (Specify)***_____
12. Can't say

Section C

Risk assessment for production

The table given below, asses the sensitivity of performance of a particular produces in terms of volume and value for a risk factor. An adverse change of 20% is applied to each factor to see the loss it incurs.

Risk factor	Loss in value	Loss in volume	Ranking of risk factor

Risk sensitivity

Risk factor 1	Probability of occurrence 2	Degree of occurrence 3	Ranking of risk 4	Availability of risk aversion 5		
				Type	Volume of crop saved	Effectiveness (Vol saved/ total vol)*100

Section D

FARMERS

1. How many months does your agribusiness have positive cash flow? _____
2. Is your business profitable during the whole year? Yes / No
3. Do you and your family keep written financial records of revenues and expenses? 1 = Yes/2 = No
4. What is the approximate distance you have to travel and approximate time it takes to travel to the nearest lending financial institution? _____ in kms _____ in minutes
5. In your opinion, if you want to get a loan from a financial institution, how important are the following factors? (*Rate from 1 to 5, with 1 being least important and 5 very important*):
   a. Convenient location of financial institution 1 2 3 4 5
   b. Quick disbursement of loan (quick processing of loan application) 1 2 3 4 5
   c. Quality of service of financial institution's staff 1 2 3 4 5
   d. Low interest rate/cost of borrowing 1 2 3 4 5
   e. Convenient repayment period 1 2 3 4 5

f. Absence of requirement for immovable property as collateral 1 2 3 4 5

g. Availability of other financial services from same financial institution 1 2 3 4 5

6. Have you **applied for** a loan from a financial institution in the previous three years?

1. Yes 2. No

7. What were the reasons you have not applied for a loan with a financial institution?

(Mark up to two)

a. Primary reason (mentioned first) _____

b. Secondary reason (mentioned after primary reason) _____

(0 if only one reason was given)

a. High interest rates

b. Short loan term (maturity)

c. Excessive collateral requirements

d. Lengthy application process

e. High costs associated with borrowing

f. No lending financial institution in convenient proximity to my business/residence

g. High risks – uncertain of own ability to pay interest and repay principal

h. Did not know could receive credit from a financial institution

i. Did not apply because was denied credit earlier

j. Don't need a loan

k. Other (please specify)

_____

8. Have you taken any loan **for farming** in the last five years?

1. Yes 2. No

9. ***(If yes in Q8)*** The loan you took for farming was used **mainly** for which purpose?

a. To purchase land

b. To purchase fertilizers, seeds, pesticides etc.

v. To purchase farming equipments like tractor, thrasher etc.

d. For son's business

e. For daughter's marriage

f. To return money to the money lender

g. To return bank's old debt

h. To purchase cattle

i. ***Other (Specify)***_____

10. ***(If yes in Q8)*** From where all did you take the loan?

a. Public/Govt. bank

b. Private Bank

c. Cooperative bank

d. Friend or relative

e. Self help group

f. Money lender

g. Agricultural Trader

h. Commission agent/Adhatiya

i. ***Other (Specify)***_____

j. ***(If yes in Q8)*** At what rate of interest did you take the loan? Monthly or Yearly_____% (Percent) 1. Monthly 2. Yearly

11. How often do you insure your crops ?

1. Always 2. Sometimes 3. Never 4. Can't say

12. What is the main reason for not opting for crop insurance?

a. Shortage of money

b. Insurance policies not in favour of farmers

c. Dont Trust insurance companies

d. Never felt the need for insurance

e. Lack of information

f. Insurance facility is not available

g. Landless labourer

h. Never heard about crop insurance

i. ***Other (Specify)***_____

j. Can't say

13. Have you paid all your debts in time? Yes/ no

14. General information about the loan:

Date of borrowing	**Reason for borrowing**	**Source of borrowing**	**Interest rate**	**Amount paid (principal + interest)**	**Amount pending (principal + interest)**

Section E

1. Activities done by each stakeholder

	Farmers	**Local sellers**	**Commission agents**	**Traders**	**Retailers**
Input supply					
Production					
Harvesting					
Primary grading					
Sorting					
Drying					
Storage					
Packaging					
Transportation					

2. Percentage of product output sold to various actors

Name of the produce										
Farm size	**Local private**	**1**	**Mandi**	**1**	**Government**	**1**	**Input dealers**	**1**	**Processors**	**1**
0-2 ha										
2-5 ha										
5-10 ha										
>10 ha										

Code: 1 - Percentage of produce sold.

3. Price spread

Name of produce	Cost of production	Farmer's price	Whole sale price	Processor's price	Whole seller price	Retailers' price

4. Price difference in produces

Name of Crop	Price per kg	Organic	Inorganically produced	Grade A	Grade B	Grade C

5. Seasonality of each crop

Jan	Feb	March	April	May	June	July	Aug	September	October	Nov	Dec
Peak											
Lean											
Medium											

6. Major factors for existence of unregulated market

Factors responsible	Yes / No	Ranking
Distance from the market		
No knowledge of regulated market		
Payment delays		
No provision for sale of their particular produce		
Harassment of coolies or hamals		
Better price at local market		
Small quantity of production		
Advance taken at local market		

7. Cost incurred for bringing product to market

Cost factors	Cost bearer	**Crop1**	**Crop2**	**Crop3**	**Crop 4**
Transportation cost					
Market fee					
Commission charge					
Loading/unloading					
Weight charges					
Storage					

8. Value addition of produce at different stages of value chain

Name of Crop …….								
	Raw Produce		**Juice Per Litre**		**Processed Gel**		**Packaged Gel**	
Per kg	**Cost incurred**	**Price fetched**	**Cost incurred**	**Price fetched**	**Cost incurred**	**Price fetched**	**Cost incurred**	**Price fetched**
Percentage of farmers involved								
Percentage of traders involved								
Percentage of processors involved								

Section F

Information reach ability

1. Please tell me, have you heard or read about these schemes? Have you or your family benefited from any of these schemes? Yes no benefited not benefited.

   a. Rashtriya Krishi Vikas Yojana

   b. Gramin Bhandaran Yojana

   c. National Food Security Mission (NFSM)

   d. National Agriculture Insurance Scheme (NAIS)

   e. Agriculture Technology Management Agency (ATMA)

   f. Gramin Beej Yojana

   g. Krishi Vigyan Kendra

h. Apart from the above scheme have you

i. heard of any other scheme. ***(Name)***_____

2. Have you heard of minimum support price? Yes/no
3. People take suggestions from different quarters to gather information about seeds, fertilizers etc. in order to increase their production. Generally from whom do you take suggestions on the following issues?

(i) **Self**

(ii) **Friend or relative**

(iii) **Agriculture expert**

(iv) **Shop Govt.**

(v) **Other Agency**

(vi) **Call-centre farmers**

a. Regarding seeds 0 1 2 3 4 5

b. Regarding fertilizers 0 1 2 3 4 5

c. Regarding pesticides 0 1 2 3 4 5

d. Regarding loan 0 1 2 3 4 5

e. Regarding farming equipment 0 1 2 3 4 5

4. Have you ever contacted the following Kisan call centre to enquire about farming?

1.Yes 2.No 3. Not-heard 4. Can't say

a. Private Kisan call centre 1 2 3 4

b. Govt. Kisan call centre 1 2 3 4

5. Do you have a mobile phone? Yes/No
6. If answer to question 6 is yes, have you ever got a kisan sms on your mobile?

a. Yes b. No

7. If your loan is sanctioned by any financial institute, what would be the acceptable rate of interest?

	Yes	**Likely**	**Unlikely**	**No**
24%				
20%				
16%				
12%				
Acceptable interest				

Annexure-2

Questionnaire for Traders

Name of Crop …….

1. Name of trader……...
2. Age…….
3. Education……
4. Name of Mandi…….
5. Years of experience……

Section A

Losses

1. How much crop is spoilt in last season?

   A. aloe vera……. B. aonla…… C. ashwagandha……

2. what was the **main reason** for destruction of the crop? ***(Try to get one answer)***
3. 01. Drought 02. Flood 03. Pest attack 04. More or less rain
4. 05. Animal/ Bird Attack 06. Lack of electricity 07. Lack of irrigation facility 08. Hailstorm
5. 09. Weather was very hot/cold 10. Unseasonal rain
11. ***Other (Specify)***_____ 12. Can't say

Section B

FINANCE

1. Do you receive your payments from retailers in time? Yes/no
2. Do you pay any fine in case of delay in delivery of crops? Yes/ no
3. Do you charge any extra price to farmers in case of delivery of crops? Yes/no
4. Which of the following reasons cause more financial losses? Rank 1 to 10 in order of high risk factors.
   a. Increase in transportation cost
   b. Increase in storage, electricity cost
   c. Delay in procurement
   d. Commodity price fluctuation
   e. Low rainfall, drought, flood etc.
   f. Intervention of government to protect farmers
   g. Others specify…….

RETAILERS

1. Which grade of crop is more likely to incur loss?

   a. Best grade b. medium grade c. low grade

Section C

1. ACTIVITIES

	Farmers	**Local sellers**	**Commission agents**	**Traders**	**Retailers**
Input supply					
Production					
Harvesting					
Primary grading					
Sorting					
Drying					
Storage					
Packaging					
Transportation					

Section D

1. Major factors for existence of unregulated market

Factors responsible	**Percentage of farmers voted for the option**
Distance from the market	
No knowledge of regulated market	
Payment delays	
No provision for sale of their particular produce	
Harassment of coolies or hamals	
Better price at local market	
Small quantity of production	
Advance taken at local market	

2. Cost incurred for bringing product to market

Cost factors	Cost bearer	Crop1	Crop2	Crop3	Crop 4
Transportation cost					
Market fee					
Commission charge					
Loading/unloading					
Weight charges					
Storage					

Demand- Supply Gap analysis

Domestic market

3. Price trend in last four years (state vs. national)

Commodity	Price in 2012-13		Price in 2013-14		Price in 2014-15		Price in 2015-16	
	State	National	State	National	State	National	State	National

4. Table on domestic consumption

Commodity	Quantity brought to Mandi	Quantity sold within state	Quantity sold outside state	States where sold

5. Purchase pattern

Commodity name					
Big players		Medium players		Small players	
Name	Quantity	Name	Quantity	Name	Quantity

6. Purchasing preferences

Commodity name	Organic	Fertilizer produced	Whole raw item	Processed	Semi processed	Higher grade
Big players						
Medium players						
Small players						
Cosmetic industry						
Pharmaceutical industry						
Food industry						

7. Price difference in produces

Price per kg	Organic	Inorganically produced	Grade A	Grade B	Grade C

International/export market

8. Surplus

Name of commodity	Total domestic production	Quantity imported	Quantity exported	Surplus quantity

9. Export of commodity from India to world

Name of commodity						
Name of countries	Exported value in 2011	Exported value in 2012	Exported value in 2013	Exported value in 2014	Exported value in 2015	Exported value in 2016

Finding potential destinations for export

This is done on three parameters:

1. Average export by destination over 5 years.
2. Unit price fetched by exporting country.
3. Average annual growth rate.
4. Sanitary & Phyto-Sanitary (SPS) and TBT issues levied by destination
5. Present trend intensity index in potential destination.

Importers	**Tons of import during the year**				
	2012	**2013**	**2014**	**2015**	**2016**

11. Capacity analysis of present commercial units

1	**2**	**3**	**4**	**5=col.4/col.3**
Name of produce	**Number of commercial units in the state**	**Total design capacity**	**Actual output**	**Utilization**

12. Condition of regulated market in the state

Name of district	**No of regulated market**	**Total cropped area served by these markets**	**% of markets with the following facilities**								
			1	2	3	4	5	6	7	8	9

Condition of regulated markets

Codes: 1- cold storage, 2- grading, 3- auction platform, 4- electric light, 5- weighing equipment, 6- loading unloading facility, 7- internal loads, 8- farmers' rest house, 9- drying yards

13. Value addition of produce at different stages of value chain

Name of commodity…….								
	raw produce		juice per litre		processed gel		packaged gel	
Per kg	Cost incurred	Price fetched	Cost incurred	Price fetched	Cost incurred	Price fetched	Cost incurred	Price fetched
Percentage of farmers involved								
Percentage of traders involved								
Percentage of processors involved								

Annexure-3

Questionnaire for Line Departments

Note: As every government organization has its own data sheet, the following questionnaire will serve only as guidance for data collection and excel sheet filling. Please collect any other data given by the organization.

Name of organization……..
Name of contact person…….
Designation ……
Contact number……
Email …….

Aamla	**Fruit weight**	**Content of vitamin c**	**Fibre weight**	**Juice weight**
Standard				
Present				

Factors for good agricultural practices

Aloe-vera	**Soil type**	**Moisture content in soil**	**Ph level**	**Presence of heavy metal in soil**	**Organic matter content**	**Exposure to heat**	**Exposure to rain**	**Crop rotation done with right selection? y/n**	**Harvesting period**
Desirable									
Prevalent									
Aonla	**Soil type**	**Moisture content in soil**	**Ph level**	**Presence of heavy metal in soil**	**Organic matter content**	**Exposure to heat**	**Exposure to rain**	**Crop rotation done with right selection? y/n**	**Harvesting period**
Desirable									
Prevalent									
Ashwagandha	**Soil type**	**Moisture content in soil**	**Ph level**	**Presence of heavy metal in soil**	**Organic matter content**	**Exposure to heat**	**Exposure to rain**	**Crop rotation done with right selection? y/n**	**Harvesting period**
Desirable									
Prevalent									

Qs. What is the shelf life of

A. Aonla……. B. Aloe vera…….

C. Ashwagandha……?

Block/district (depending on data availability) wise yield assessment

Every state is divided into different blocks/ districts geographically and thus productivity of block for individual crop may vary. To understand the yield in each block a crop yield index is calculated and compared.

Crop **1**	**Yield in quintal per hectare**		**Area under crop in block/ district** **4**	**Crop yield in block/ district as a percentage of entire region** **5**	**Percentage of area under crop** **6**
	Average yield in entire region 2	Average yield in block/ district 3			
Total					

Crop yield index= total of column 6/ total of column 4

Productivity and blocks

Productivity category	**Crop index**	**Area covered**	**% of total area**	**Number of blocks/ district**	**Name of blocks/ district**
Very high	104 and above				
High	97.6 to 103.9				
Medium	90-97.5				
Low	82-89.9				
Very low	Below 82				

Production trend with respect to cost of production and price trend

The elasticity of any produce affects its volume of production. Another aspect is inflation which can be felt in cost of production for the farmer. The same can be measured through different graphical trends, pie charts and bar graphs depending on the need of study. The table below shows the different factors that can be analysed while comparing the three trends.

Name of vegetable	**Cost of production in 2012-13**	**Price in 2012-13**	**Volume of production in 2012-13 grade wise**			**Cost of production in 2013-14**	**Price in 2013-14**	**Volume of production 2013-14**			**Cost of production in 2014-15**	**Price in 2014-15**	**Volume of production in 2014-15 grade wise**		
			A	B	C			A	B	C			A	B	C

District wise spatial distribution of Mandies in the state

Name of district	**No of villages served per mandi**	**No of mandies**		**Mean no. of mandies within r km of each mandi**		
		Per thousand ton production	**Per thousand hectare**	**R= 10**	**R= 20**	**R= 30**

Block/ district wise variation in price

Name of produce		
Name of block	Name of district	Standard deviation

Minimum support prices according to crop year in rupees per quintal

Commodity	2014-15	2015-16
Aloe-vera		
Aonla		
Ashwagandha		

Cost incurred for bringing product to market

Cost factors	*Cost bearer*	***Crop1***	***Crop2***	***Crop3***	***Crop 4***
Transportation cost					
Market fee					
Commission charge					
Loading/unloading					
Weight charges					
Storage					

Demand-Supply Gap analysis

Domestic market

Price trend in last four years (state vs. national)

Commodity	**Price in 2012-13**		**Price in 2013-14**		**Price in 2014-15**		**Price in 2015-16**	
	State	**National**	**State**	**National**	**State**	**National**	**State**	**National**
Aloe-vera								
Aonla								
Ashwagandha								

Table on domestic consumption

Commodity	**Quantity brought to Mandi**	**Quantity sold within state**	**Quantity sold outside state**	**States where sold**
Aloe-vera				
Aonla				
Ashwagandha				

Purchase pattern

Commodity name					
Big players		**Medium players**		**Small players**	
Name	**Quantity**	**Name**	**Quantity**	**Name**	**Quantity**

Purchasing preferences

Commodity name	**Organic**	**Fertilizer produced**	**Whole raw item**	**Processed**	**Semi processed**	**Higher grade**
Big players						
Medium players						
Small players						
Cosmetic industry						
Pharmaceutical industry						
Food industry						

Price difference in produces

Price per kg	**Organic**	**Inorganically produced**	**Grade A**	**Grade B**	**Grade C**
Aloe-vera					
Aonla					
Ashwagandha					

International/export market

Surplus

Name of commodity	**Total domestic production**	**Quantity imported**	**Quantity exported**	**Surplus quantity**

Export of commodity from India to world

Name of commodity					
Name of countries	**Exported value in 2011**	**Exported value in 2012**	**Exported value in 2013**	**Exported value in 2014**	**Exported value in 2015**

Finding potential destinations for export

This is done on three parameters:

1. Average export by destination over 5 years.
2. Unit price fetched by exporting country.
3. Average annual growth rate.
4. Sanitary & Phyto-Sanitary (SPS) and TBT issues levied by destination
5. Present trend intensity index in potential destination.

Importers	**Tons of import during the year**				
	2012	**2013**	**2014**	**2015**	**2016**

Capacity analysis of present commercial units

1	**2**	**3**	**4**	**5=col.4/col.3**
Name of produce	**Number of commercial units in the state**	**Total design capacity**	**Actual output**	**Utilization**
Aloe-vera				
Aonla				
Ashwagandha				

Condition of regulated market in the state

Name of district	**No of regulated market**	**Total cropped area served by these markets**	**% of markets with the following facilities**								
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Codes: 1- cold storage, 2- grading, 3- auction platform, 4- electric light, 5- weighing equipment, 6- loading unloading facility, 7- internal loads, 8- farmers' rest house, 9- drying yards

Annexure-4

Questionnaire to cover Success stories

Section A: to be filled in case the story involves any NGO

1.	Name of NGO……..
2.	Founder …….
3.	Area of expertise……
4.	Registration date…….
5.	Contact person ……..
6.	Designation …….
7.	Ph number……..
8.	Region of study …….

1. What was the year of intervention?

   Ans.

2. How many people were involved initially?

   Ans.

3. Tell us about your intervention.

4. What is the mission statement of your NGO?

   Ans .

5. What is the vision statement of your NGO?

   Ans.

6. Who are your funding partners?

   Ans.

7. Tell us the major challenges faced by you?

   Ans .

8. What was your motivation behind the intervention?

   Ans.

9. Why did you choose this area?

   Ans.

10. Which other organizations did you partner with?

    Ans.

11. What are the main activities performed by you?
    Ans .
12. Tell us the growth story of each year since inception.
    Ans.
13. How many people till date got benefitted through this intervention?
    Ans.
14. How many women are involved in the intervention?
    Ans.
15. What trainings did you give to the beneficiaries?
    Ans.
16. What is your NGOs exit plan?
    Ans.

Section B: to be filled for a beneficiary of NGO or individual / group carrying out the intervention

17. When did you start working in the intervention?
    Ans.

18. What motivated you?
    Ans.

19. What were your first thought after hearing about the intervention?
    Ans.

20. Who informed you about the intervention?
    Ans.
21. What was your income before the intervention?
    Ans.
22. What is your income after the intervention?
    Ans.
23. Is there any change in your household assets after the intervention?
    Ans.
24. Tell us any major decision you could take because of increase in income after the intervention
    Ans.

25. Do you remember any memorable incident while working for this intervention? If yes then please narrate.
    Ans.

26. Stakeholder analysis

Stakeholders	**Major activities performed**	**Number of members**	**Benefits**	**Risks**

Section C: The following are a few questions for focus group discussions amongst the beneficiaries. The data collector will play the role of facilitator only.

27. What can be done to fetch better price for the produce?
28. What are the expectations from the government?
29. What issues still persists among the farmers?
30. How are the farmers exploited by the agents and middlemen?

Questionnaire for collection practices by forest dwellers

1. In which season do you go for collection?
2. Tell us about your clock cycle during collection period and after collection period?
3. Who comes to collect the produce from you?
4. Why do you sell them?
5. At what rate do you sell ?
6. Do you know at what rate it is sold in shandi?
7. What type of vehicles is available for you?
8. How far is the nearest mandi from you?
   (rest of the questions will be from farmer questionnaire for aonla)

Questionnaire for GCC and other forest divisional organizations

1. What measures have the government taken to enhance community rights and community forests?

2. Do you think the field level officials have enough knowledge on the provisions of FRA?
3. What provisions are added for NTFP promotion in your working plan and micro plans? Please provide reports.

For GCC administrative officials

a) How is procurement done by GCC?
b) How do you contact the tribal?
c) What are your pre requirements before choosing an area for collection?
d) Do you work in alliance with other line departments? Elaborate
e) What is the quality of produce in Telangana?
f) How is Telangana produce different from Andhra Pradesh produce?
g) Please provide data of financial reports, yield, volume and productivity in last 5 years?
h) As GCC is established for tribal welfare, what changes did you bring to their socio economic life since inception?
i) What challenges did you face initially?
j) How did you overcome the challenges?
k) What are your major hurdles at present?
l) What is your future plan for next 5 years?

For GCC processing units

1. Which area is covered under your unit?
2. What is your production list?
3. Please provide reports on overall sale performance through different agents.
4. Please tell your major marketing network.
5. What activities for the following produce are taken up by this unit
   Aloe-vera
   Aonla
   Ashwagandha
6. Please provide data on target and achieved volume of produce for last five years?
7. What machinery and technology is used by this unit? Please provide machinery and its use.
8. What operational hurdles you face?
9. Do you have good communication with the forest dwellers?

NIAM

CCS National Institute of Agricultural Marketing

Kota Road, Bambala, Pratap Nagar
Sanganer, Jaipur -302033