

Analysing the Value Chain of Quinoa: A Case Study of Quinoa - The Queen to be

by K. Srinivas, Upma Dubey & Navya Lalitha

Abstract

This case is about Quinoa, a nutritious grain which has minimal penetration in Indian food industry. Inner being wellness private ltd., a Nutraceutical firm, took up the challenge of introducing quinoa on a large scale, to make a difference in the Indian grain market. The case analyses Quinoa in terms of its utility, market potential, and also feasibility to the Indian market. It deals with the value chain of Quinoa from the perspective of all the stakeholders involved. The case also has found out the loopholes in the value chain and provides ideas to be formulated to overcome the same. It has a study about cost cutting methods which could improve the price competitiveness of Quinoa. It highlights the scope of Quinoa to be included in the food bowl of India.

Keywords

Quinoa, Nutraceutical Market, India, Health, Agriculture

Background

India Health and Nutrition

Despite the Green Revolution and the much-admired national level food security, ensuring household and individual level food and nutritional security is still a daunting task. India is home to about 240 million undernourished people. As per the Global Hunger Index (GHI), 2014, in the list of 76 countries, with a GHI of 17.8 against the world average of 14.6 India ranked 55th, posing an alarming situation. The high GHI is the result of high levels of child underweight. A recent UNICEF report reveals that India accounts for 42% of world's underweight children under five years of age. According to an estimate, more than 51 and 74% women and children are anemic respectively. India is home to nearly 622 million diabetics-second only to China. Food-based nutrition is the most important way to fight hidden hunger, under nutrition and ill health. Nutrition is the focal point of health and well-being. Nutrition is directly linked to human resource development, productivity and ultimately to the national growth. Malnutrition is a complex phenomenon. It is both the cause and effect of poverty and ill health, and follows a cyclical, inter-generational pattern.

India and Dry Land

About 69 percent of India is dry land – arid, semi-arid and dry sub-humid and these areas are heavily populated, Degradation has severe implications for livelihood and food security for millions of people living in these areas. About 70% of rural population lives in dry farming areas and their livelihood depend on success or failure of the crops (SOURCE: FAO). Dry land Agriculture plays a distinct role in Indian Agriculture occupying 60% of cultivated area and supports 40% of human population and 60 % livestock population. By the end of the 20th century the contribution of dry lands will have to be 60 per cent if India is to provide adequate food to 1000 million people (SOURCE: FAO).

Challenges at the Base of the Economic Pyramid



Quality
Healthcare



Improved
Agriculture



Livelihood
Creation



Water
Scarcity

There are many hurdles coming in the way of India's development. Those are quality health care, improved agriculture, livelihood creation, water scarcity. This hugely affects the India's development. These are the economic challenges for India. If we are able to reduce them, then it will contribute in the development of India.

Inner Being Wellness Private Ltd.

While at the gym, making health, Director of Inner Being Wellness Private Ltd., Mr. C. S. Jadhav was wondering if there could be a healthy complete meal food from a single source for people like him. He just had a session with his nutritionist who gave a half hour long lecture about what all he should consume. In order to attain a balanced diet, along with the list which consisted various protein & vitamins supplements. Now, he wanted a natural food which could replace all these supplements and he got a solution called- Quinoa.

He heard about Quinoa through Project Anantha, an AP government initiative to promote the cultivation of crops which can withstand adverse conditions. One of those crops is quinoa.

Pronounced "keen-wah" this protein-packed grain contains all the essential amino acids, trace elements and vitamins, and is also gluten-free. Quinoa is also a good source of iron, magnesium, vitamin E, potassium, and fiber. Although not a cereal, it is consumed in a similar way to rice and other staple grains. Quinoa also has a higher content of all important minerals than maize, rice or wheat (except sodium), and contains large amounts of folate. The Food and Agricultural Organization of the United Nations (FAO) has designated quinoa as a "super crop" due to the crop's resilient ability to grow under all kinds of not-so-favorable conditions, and for its potential to feed the hungry across the world.

On the production side, quinoa has an extraordinary ability to adapt to different climatic conditions and agro ecological zones. It can grow in relative humidity varying from 40 percent to 88 percent. It is also grown at altitudes from sea level up to 4000 meters, and at temperatures ranging from -4°C to +35°C (FAO, 2012). It is also highly water efficient and can produce acceptable yields with rainfall as low as 100–200 mm per year (Exhibit 1). Recognizing the significance of all of these properties in eradicating hunger and malnutrition, with Bolivia's proposal, the United Nations General Assembly declared 2013 the International Year of the Quinoa.

Although still relatively unknown in many parts of the world, quinoa is becoming increasingly popular in international markets, especially among consumers in developed countries in North America and Europe.

Quinoa and its Peers

Quinoa seeds are very nutritious. Seed, in comparison with other cereals, is higher in protein content (approx. 14.6%). Its protein fraction is well balanced and comes close to the ideal protein, qualitatively corresponding to casein. It has more favourable amino acid composition also - higher content of lysine, methionine and treonin and high content of arginine and histidine, which are important in infant nutrition. The starch content is approximately 60% represented by small granules usable in food industry as an ingredient in cream substitute. Quinoa starch shows better viscosity than other cereals. Low content of amylose and the size of starch granules are significant factors affecting usage of quinoa flour. Products are much elastic and nutritive by 10% addition of quinoa in common flour. If higher amounts of quinoa flour is added then the volume and porosity of paste is lower and consistency is tough. Amount of lipids in quinoa is about 8% of dry mass. The oil is very stable thanks to relatively high natural antioxidant content. Total oil contains 54 % of linoleic acid and 20% of oleic acid. Quinoa is a good source of thiamine, folic acid and vitamin C but has lower content of niacin (B3) in comparison with other cereals. Seeds contain more Ca, P, Mg, Fe, Zn, Na and Cu than cereals (Exhibit 2). It is very important to realise distribution of every single mineral in fractions of the seed. Seeds contain some anti-nutritious compounds such as saponins, phytates, tannins, and protease inhibitors. Of all these compounds the amount of saponins causing bitter taste is the least desirable but we can remove it through processing.

Market Potential

India's nutrition market is rapidly developing. Nutrition market (packaged and fresh food included) in India is said to be roughly \$4bn (about 10% of global market). The nutrition market in India is expected to grow tremendously in the next five years.

The global market for medical nutrition is projected to reach US\$40.1 billion by 2018, thereby exhibiting a 2008-2018 CAGR of 5.8%. The Indian medical foods market revenues are expected to reach approximately US\$4.2 billion in 2017 (FAO).

India has the second highest number of people with diabetes in the world, which is expected to increase to 101.2 million by the year 2030 (FAO). So in India where glucose (sugar) is translated as "energy" we have to pay attention to this. "Energy" is key focus in consumer goods market and has been for a few years. This is due to the fact that "managing fatigue" is a significant health benefit consumers are looking for. Especially with modern

lifestyle when everyone is trying to do more with less time. The growing interest in nutritional based food is due the change in perspective among the people. Consumers are looking to follow healthy lifestyles to obtain optimum nutrition to keep the diseases at bay, leading to an increase in nutrifood consumption by health.

Quinoa in the Neighborhood

Considering the characteristics and comparative study of Quinoa, the director of Inner Being had two option to bring Quinoa into the domestic market. First is to import and the other is to create supply chain within. If he imports, the cost of Quinoa which is already high due to lack of technology intervention, will further increase making it difficult for Quinoa to withstand from the indirect competitors like millets, oats etc.

The import price of quinoa is dependent upon custom duty and tariffs, associated with the risk of international price and compromise with quality. The procurement cost is very high giving rise to increase in per unit cost of quinoa in the market. Given the price sensitivity of domestic market, such high prices will hinder the demand creation.

Domestic supply chain would decrease the procurement cost. One of the competitive advantages will be quality and consistency because of continuous feed stock development in the backward supply chain.

Business Model & Key Partners

Inner being team with its vast experience and expertise in developing innovative business models, have come out with a unique business model right from R & D, Cultivation, Processing, Production of value added products and Marketing of the end product (Exhibit 3). With this unique business model the team expects gigantic returns from Quinoa Plantation.

Research and Development

They have collaborated with an International organization for satisfying the following objectives:

- To provide quality seeds to farmers
- To increase the potential yield
- Proper pest management
- Proper nutrient management

The organization is a nonprofit, international center of excellence for research and development in marginal environments. Over the last 13 years, the organization has evolved into a world-class modern research facility with a team of international scientists conducting applied research to improve the well-being of poor farmers in marginal environments. The

organization is working on a no. of technology developments including the use of conventional and unconventional water; water and land management technologies; remote sensing and modeling for climate change adaptation.

Nursery Production Center

They have set up the Nursery Production Center and demonstration center with a national institute to provide technical advice on the requisite regulatory formalities and to provide technical advice on market research including bringing in awareness and promotion for nutria market research. The institute renders services for building IP portfolios like patents and geographical indications to various stakeholders including farmers and scientists. Its motto, is to integrate agriculture with agribusiness for raising rural incomes, and the increased emphasis on the creation, dissemination, application and exchange of knowledge in this vital area,

Cultivation

Currently, they have cultivated 50 acres of land with 25 farmers in the area of Telangana with positive results. They have cultivated in 4 acres of land under the MoU with Ved Vignan Maha Vidya Peeth (VVMVP), Art of Living, Bangalore. The organization runs various programs which are designed to develop personality, eliminate mental stress, and improve the physical health of an individual irrespective of economic status, caste or religion. The organization also works to instill a sense of self-esteem in the youth and women of urban and rural India. It promotes educational, social, recreational, cultural and other activities that can strengthen and bring about a positive change in society.

Processing

Have a tie up with Millet Incubation Centre, Professor Jayashankar Telangana State Agricultural University for processing. After harvest, the seeds must be processed to remove the coating containing the bitter-tasting saponins. The seeds are in general cooked the same way as rice and can be used in a wide range of dishes. The leaves are eaten as a leaf vegetable, much like amaranth, but commercial availability of quinoa greens is limited. The by product – saponin further can be used for used for liquid soap, jewelry polish, detergent, exzema/dermatitis cure, pesticide/insecticide, pet shampoo, human shampoo, surf spreader/sticker, antimicrobe, parasite remover (tick, flea) etc.

Value Propositions

- New and innovative products by taking consideration of the different age groups and their body requirements correspondingly. The products will be like:
 - For children- Biscuits, Flakes, Noodles, Milk flavour additives
 - For youngsters and elders- Fortified processed grain and flour from millet and quinoa, vermicelli etc.
- Validation and analysis of the nutrient in the end products for creating trust with the consumers.
- Quinoa can be grown by utilizing dry and unutilized lands. Thus, utilizing the natural resources properly and preserving the natural environment as well as enhancing the green cover.
- Helping farmers realize the benefits of sound soil management, provide quality raw materials and educate them with the technical know-how of the agriculture practices.
- Creating better livelihood to the farmers, workers and communities involved in the value chain, helping the farmer with high yields with the limited land resources using them in an efficient manner thereby creating sustainable agriculture.

Key Activities & Key Resources

Farmer-Company

Under the contract farming inner being provides the required inputs timely on the credit basis with buy-back contract and purchase the output at predetermined price to the farmers. They create awareness among farmers by providing technical know-how and make them adhere to standard package of practices. Having less maturity days, less water requirement, low maintenance attracts farmers to grow quinoa.

Company-Processing-Company

Currently, they are processing quinoa from Millet Incubation Centre, Professor Jayashankar Telangana State Agricultural University from the machinery used to process millets.

Company-Consumer

There is no direct competition for quinoa, an indirect competition is there from the other food. Though there is a huge market demand for the healthy food but there are limited possible sources like Kellogg's corn flakes, PepsiCo's Quaker Oats, Marico saffola oats, Horlicks's oats and other ready-to-eat foods which are very expensive and also contain preservatives and

artificial food additives. Because of the limited choice the Consumers are left with no other option other than compromising with the available brands & products. In the same pace Inner Being aim to bring innovative value added products from quinoa at reasonable prices with competitive advantages of quality and consistency. They want to penetrate untapped Indian market through strong advertisement and proper distribution channel.

Business Problem

Farmer-Company

Caterpillar attack (Pest attack) in the last stage, lack of technical knowledge among the farmers and low yielding varieties are the hindrances for the backward supply chain of quinoa.

Company-Processing-Company

There is no specific machinery for processing quinoa in India yet.

Company-Consumer

One of the major challenges is creating awareness about the healthy foods among the consumer (Market penetration). Other challenge is of MNC's, which are aggressively marketing synthetic processed food and ready-to-eat food. The other side is unorganised players who are marketing processed food which does not have quality.

Consumer Market

The product life cycle of quinoa as of now has a well-planned beginning and an undefined ending, given the long term projections of its fate in the market. Having decided upon the technicalities in the business plan, utmost care needs to be taken during the introduction stage to ensure the establishment of the desired image among the target groups. The acceptance pattern of quinoa can be closely compared to that of oats in the recent past. This raises a question as to will the consumers accept quinoa while oat is still, considerably a newcomer; or should the quinoa take off wait till oats make some space.

Approach

Company conducted a market survey to understand the perception about quinoa in terms of farmers, distributors, processors and consumers.

15 farmers in and around Anantpur and Mehboobnagar were interviewed to get their views on cultivating quinoa, level of difficulty involved, profitability and the technical issues being faced. 4

distributors, 2 processors and 83 customers were also interviewed to collect the primary data.

The survey consists of questions to gauge the desire of customers to buy quinoa by the different segment of society, the preferred price range, preference of attribute in purchasing of quinoa by the customers, segment of customers who are consuming quinoa (Exhibit 6).

Survey Result

The survey has given some significant inputs to plan and develop a strategy. Quinoa is a massive hit among the home makers even before release. These ladies who are forever in search of fresh inventions to present on the dining tables reacted positively when they found out that there is a new potential staple, much more nutritional and promising than the existing ones. This very excitement blinded them regarding the price factor and thus there was 100 % acceptance for quinoa amongst the women. The survey has given some significant inputs to plan and develop a strategy; a complete picture of where to sell quinoa, how to sell quinoa and who will buy quinoa.

Customer Segments

Potential quinoa consumers are concentrated in the urban areas, and to some extent sub-urban areas around Hyderabad. Quinoa suits the fast moving lifestyle of city dwellers, providing all the essential nutrients from each and every segment of the food pyramid in a single dish. Hence the target segments for inner being are children, home makers, youngsters, and the late adults from urban areas for whom quinoa is best suitable in all aspects like affordability, taste and awareness.

Channels

Now we know who would most probably buy quinoa. How do we reach them and sell quinoa is the question. The most preferred producer-consumer interfaces for our targeted segment of customers are the organised retail outlets where the consumer will be able to pick the product from shelves. Also, as we are targeting the home makers and late adults, door-to-door sales and marketing is also feasible. A dealer in each locality, who is the resident of that particular area, can be contacted to take up a contract initially for a short period of time, to publicize quinoa among the residents.

Inner Being quinoa is also to be uploaded onto the shelves of the e-tailers, to cater to the internet customers. Also, the customers are to be reached through the big players who already created a value with their

products. These companies will promote inner being's quinoa brand.

Customer Relationship

The company's customer relations desk plans to build a strong connection with the consumer by meticulously looking into the issues from the size of the packet to quality and composition. Create unique flavours and associate with cartoon characters, thereby creating a story, by releasing new packages every now and then, so that the kids segment is associated with the brand continuously. Nutritional supplementary quinoa, fortified quinoa will be a hit among the gymmers.

Out of sight is out of mind. So this quinoa brand always lingers in front of the consumer, with sufficient shelf space at upper end grocery chains and retail outlets, medical stores, high class departmental stores, imported food stores, diabetic food stores, Nutritional supplement food stores and corporate office canteens.

Product Diversification

According to the Ansoff matrix, Inner Being is taking a new product into a new market, hence the deal is risky. Quinoa is barely there in the market, and faintly known to the target group. Hence the outcome of the marketing and promotion process is unknown to the statistics. Risk assessment and risk management come into picture here.

There is a risk of the product being discouraged after being tasted. To avoid that, the company could have a sample test campaign where random people are asked to taste various forms of quinoa, and the responses recorded would give an answer. Also to overcome the risk of quinoa not doing well, production and distribution of the stock will be started on a small scale and gradually modified.

Along with quinoa, a cook book written by renowned chefs with numerous recipes can be sold and circulated. Quinoa as such will also be diversified through fortified quinoa (along with oats, corn flakes and other millet combinations) which will be effective in market penetration and also brings down the overall product price.

In The End...

Inner being can increase the efficiency of quinoa, make it more popular and reduce the price, keeping the quality intact. This systemization can be achieved by following certain measures like creating demonstration centres for farmers to increase productivity, setting up company's own processing and packaging units,

providing training to the work staff, and strongly campaigning both for their brand, as well as the product per say.

Project quinoa needs stronger logic points to

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draw in VCs, and to be scaled up, to occupy significant sectors of the pie charts in Indian agriculture; to eventually become a staple of Indians and actually become the queen in the long run.

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Annexure

Exhibit 1

Particular	Details
Name	Quinoa
Scientific Name	Chenopodium quinoa
Origin	Andes region of South America
Climate	desert, warm and dry, cold and dry, temperate and rainy, temperate with high relative humidity
Temperature	15- 20°C, withstands temperature extremes ranging from 38°C to -8°C.
Sowing season	1st week of November to 1st week of December
Soil	loam soil
Seed rate	2kg/acre
Spacing	Row 20-25 cm
Fertilizer	Neem cake, Vermi compost, NPK- 20:20:15
Rainfall requirement	250-300 mm
Maturity days	100-120

Source : FAOSTAT

Exhibit 2

Crops	Calcium (mg)	Carbohydrate (g)	Protein (g)	Fat (g)	Iron (mg)	Energy (K Cal)
Quinoa	47	61.86	15.36	6	4.7	399
Barley	8.6	77.72	9.91	1.16	2	336
Pearl Millet (Bajra)	38	64	10.6	4.8	8	363
Foxtail Millet	31	60.9	12.3	3.3	2.8	351
Sorghum (Jowar)	15	74.63	11.3	3.3	4	339
Oats	11	67	11	6.3	4	384
Wheat	29	71.28	12.61	1.54	3.19	327
Rice (Brown)	11	77.24	7.94	2.92	1.6	370
Corn	7	74.26	9.42	4.74	2.7	365

Source : FAOSTAT

Exhibit 3



Source : Primary Data

Exhibit 4 Value Chain

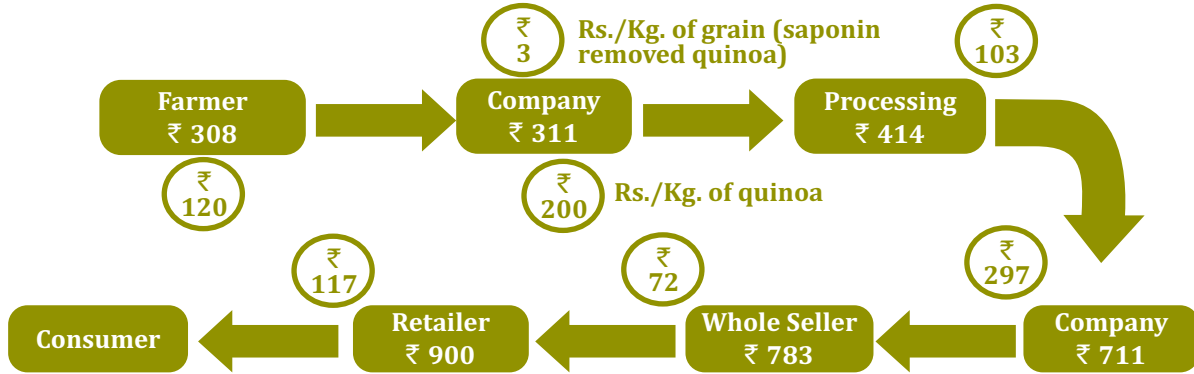
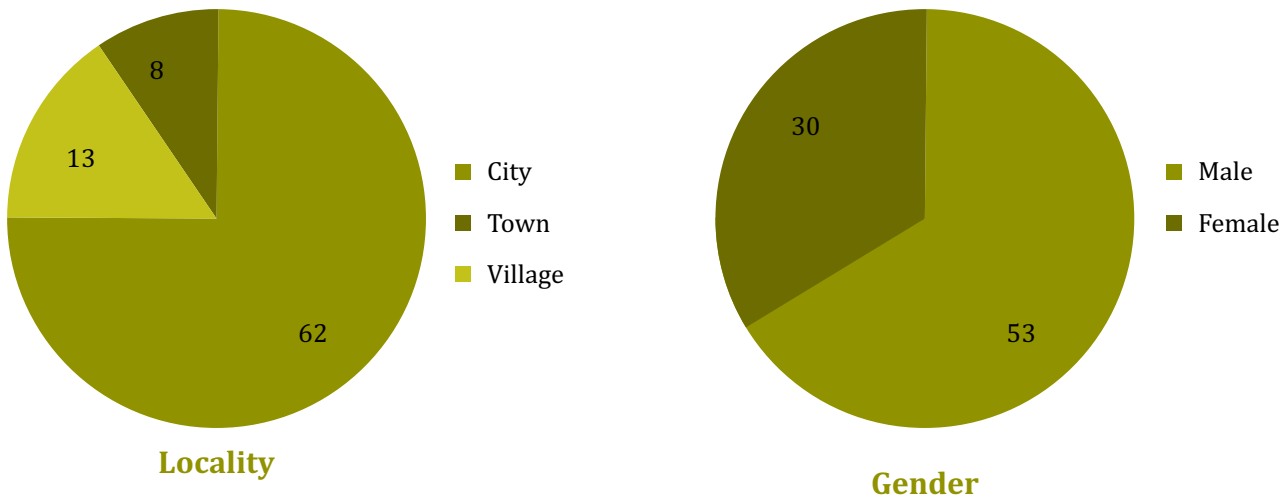


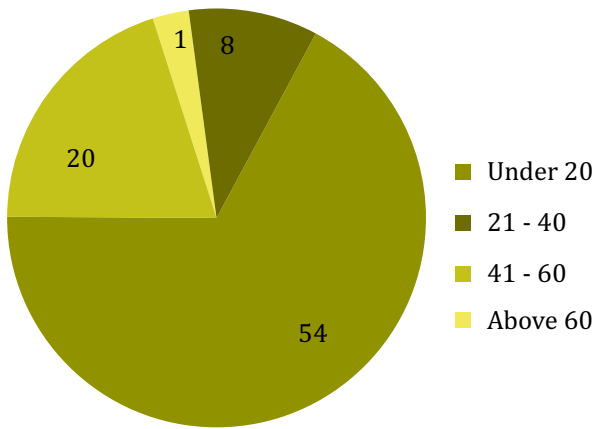
Exhibit 5

	Rs/Acre	Rs/Kg (Processing Loss- 40%)
Cost of Cultivation	14300	183.33
Cost of Procurement	24000	307.69
Cost of Handling	240	3.077
Cost of Processing	8000	102.56
Cost of Packaging	84	1.077
Cost of advertisement & marketing	23160	296.92
Total	55484	711.33
Wholesaler Margin	5548.4	71.133
Retailer Margin	9154.86	117.37
Consumer Price		900

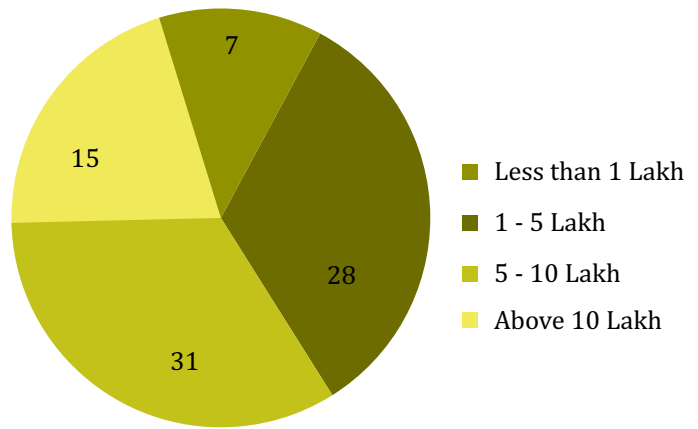
Source : Primary Data

Exhibit 6 DEMOGRAPHICS





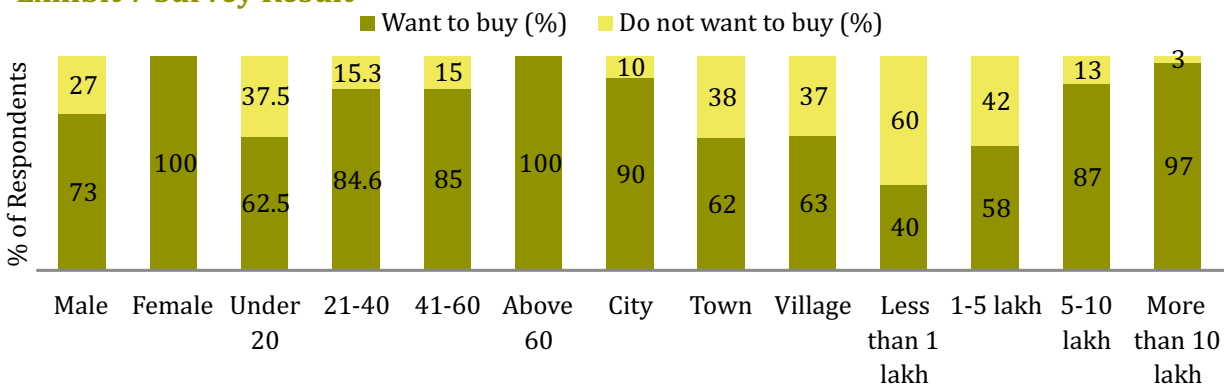
Age Group



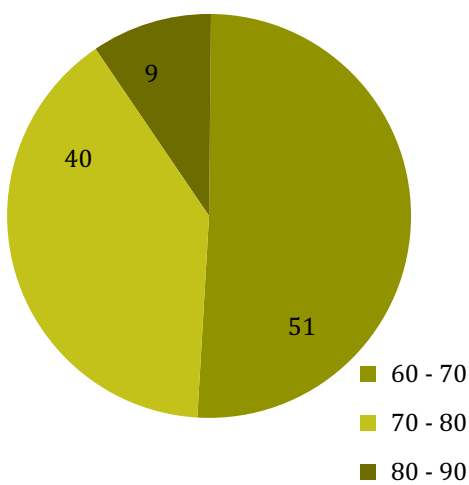
Income Group

Source : Primary Data

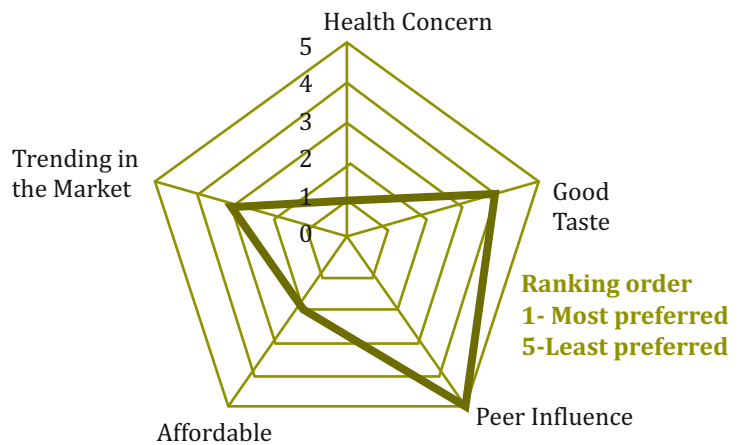
Exhibit 7 Survey Result



Desire of Customers to Buy Quinoa by the Different Segments of Society



Preferred Price Range Per 100 Gm of Quinoa



Rating According to Preference of Attribute in Purchasing of Quinoa by Customers

Author Profile



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