

## Economic Analysis of Henna Cultivation and Marketing in Taluka Tharoshah District Naushahero Feroze Sindh Pakistan

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### Abstract

The results of present study conducted to determine the majority 75.00 percent henna plant growers were engaged in farming, 10.00 percent henna plant growers have were engaged in labour and 15.00 percent henna plant growers have were engaged in the job/ business like having shopkeeper, govt. job and private jobs in the study area. In this study the 81.66 percent henna plant growers were used canal water and only 38.33 percent henna plant growers were used tube well water in the study area. An average per/acre area of fixed cost the Rs.12700.00 on which includes on an average per acre henna plant growers spent for Zaria tax and usher Rs.700.00 and rent of land Rs. 12000.00. And Rs.7150.00 on an average per/acre area of land development cost which includes on an average per acre henna plant growers spent for PloughingRs.3450.00, land leveling Rs.2500.00 and ridge making Rs.1200.00 in study area. The selected henna grower in the study area on average per acre spent a total cost of production of Rs.67194.00. This included Rs.12700.00, Rs.7150.00, Rs.13100.00, Rs.7700.00 and Rs.26444.00 on fixed cost, land development cost, marketing costs and input costs respectively. Thus the henna growers in the study area obtained per acre 76 Mds on an average and revenue per acre earned of Rs.121600.00 that obtained by the grower of henna. The henna growers on an average per acre earned during study, Rs.54406.00 on net income, Rs.121600.00 on gross income and Rs.67194.00 on total expenditure. Thus the henna growers in Tharoshah district Naushahero Feroze Sindh area on a gross income Rs.121600.00 and total expenditure is Rs.67194.00 in the study area therefore they availed input output ratio of 1:1.80 and a net income per acre earned Rs.54406.00 and total expenditure Rs.67094.00 in the study area therefore they availed input output ratio of 1:0.80 respectably.

**Keywords:** Henna, Mehndi, Zaria tax, capital Inputs, expenditure, Naushahero Feroze

### 1. Introduction

Henna/ Mehndi plant (*Lawsonia inermis L.*) is the traditional art of painting the hands, feet or body with a paste made from the powdered, dried leaves of the henna plant. Pakistan's henna producing provinces are Sindh and Punjab. In Sindh, the intensive henna farming districts are Naushero Feroze and Nawab Shah. In Punjab, the intensive henna-farming district is Bhera and Mailsi. Farmers in other areas of Sindh and Punjab also grow henna, but to a lesser extent. Commercially packaged henna, intended for use as a cosmetic hair dye, is available in many countries, and is now popular in Sindh Pakistan, as well as the India, Middle East, Europe, Australia, Canada and the United States. The color that results from dying with henna depends on the original color of the hair, as well as the quality of the henna, and can range from orange to auburn to burgundy. Henna can be mixed with other natural hair dyes including Cassia Obviate for lighter shades of red or even blond, or with indigo to achieve brown and black shades. Some products sold as "henna" includes these other natural dyes Archeologists have even found mummies with hennaed hands. It's becoming popular for a pain free, temporary body art here in the states. Three main colors red, black, and neutral are derived from the leaves, roots, and branches, respectively. Different parts of the shrub contain some of the powerful dye, lawsone, black and neutral henna, containing reddish tints. Branches are harvested and dried under the open sky and leaves grounded into fine powder. This shrub is also used as a hedge to protect crops and orchards from the animals. In Sindh, henna is cultivated in Tharoshah (Naushero Feroze district) and Mehar in Dadu production practices (DAWN, 2014).

Mehndi/ Henna are an ancient form of body art that has been practiced in the Middle East, India and parts of Africa for thousands of years. Mehndi is often viewed as a woman's practice though it has indeed been practiced by men. Mehndi is the art of applying designs to the skin through the application of pastes made with henna powder on different parts of the body. Henna was most often applied to the hands and feet. Henna was first applied as a means to cool down the body. A dot was applied to the palm of the hands and helped to cool the body. After becoming bored with the look of the single dot on the palm, the early users of henna began to add lines and other shapes. Eventually this elaboration became the beautiful designs we see today. In the different cultures where the practice of Mehndi flourished, different styles and ways of application developed. There are

the fine lines of designs of Pakistan and India. There are the more geometric patterns and designs of Morocco. There are the bold geometric shapes and patterns of various parts of Africa created with a method of tape resist. Mehndi patterns are created with the application of paste with gold rods, plastic cones and plastic bottles with tips, syringes, toothpicks and other tools henna artists have developed to get the job done and express themselves through the art of Mehndi (Khem *et al.* 2005).

In the USA, there is a fundamental contradiction in the legal status of henna based on lack of information about the history, traditions and use of henna. The USA presently allows henna to be unconditionally imported as hair dye: FDA Code of Regulations, Title 21, Volume 1, Chapter 1, Part 73, Sec. 73.2190: Henna, but forbids the use of henna for body art. Customs is charged to confiscate all henna entering the USA that has any evidence that it will be used for body art, "In April, , LOS-DO examined two shipments of a hair color product, brand names Zarqa and Almas, or color additives. Neither product has directions for use. However, the labels for both products declare henna as the sole ingredient and depict designs on the hands and feet. The color additive regulation 21 CFR 73.2190 specifically allows for the safe use of henna in coloring the hair only. The regulation does not allow for the safe use of henna to make colored designs directly on the skin, including the hands and feet." Most of the female population of South Asia, the Levant, North Africa and the Arabian Peninsula adorn their hands and feet with henna at least once in their lives, usually at a wedding, and may use it regularly for celebrating social and religious holidays. Adverse reactions in adults are extremely rare. Dermatologists regard henna as virtually harmless for use in staining skin and henna has been used as body art for thousands of years. The FDA ruling was put in place before there was any awareness that henna was used as a body art in other countries, and before there was a significant immigrant population in the USA that would want to retain henna as part of their traditional culture (Dennis, 2013).

Henna/ Mehndi come from the Arabic loosely pronounced as henna. The name henna also refers to the dye prepared from the plant and the art of temporary tattooing based on those dyes. Henna has been used since antiquity to dye skin, hair, and fingernails, as well as fabrics including silk, wool, and leather. The name is used in other skin and hair dyes, such as black henna and neutral henna, neither of which are derived from the henna plant. Historically, henna was used for cosmetic purposes in the Roman Empire. Convivencia period Iberia and Ancient Egypt, as well as other parts of North Africa, West Africa, the Horn of Africa, the Arabian Peninsula, the Near East and South Asia. It was also popular among women in 19th-century Europe. Today, bridal henna nights remain an important tradition in many of these areas. For the Indian sub continental tradition, please refer to the Mehndi article. The henna plant is native to northern Africa, western and southern Asia, and northern Australasia, in semi-arid zones and tropical areas. It produces the most dye when grown in temperatures between 35 and 45 °C (95 and 113 °F). During the onset of precipitation intervals, the plant grows rapidly, putting out new shoots. Growth subsequently slows. The leaves gradually yellow and fall during prolonged dry or cool intervals. It does not thrive where minimum temperatures are below 11 °C. Temperatures below 5 °C will kill the henna plant (Khandelwal, 2002).

So far, no study of smellier nature has been conducted to calculate return to the henna growers. Therefore; the study was designed to find out economics of henna crop and to provide information regarding the factors restricting crops production. The findings might be of great importance to other crops growers in comparing revenues obtained from henna crop. Finally; it could be of immense importance to policy makers, public and private sectors and those involved in agriculture development for future planning. The specific objectives of the study are:

## 2. Objectives

1. To study the profile of henna growers in the study area.
2. To compute input, output and cost benefit ratio availability of henna growers in study area.
3. To identify issues and suggest policy measures for promoting on henna production suggestions.

## 3. Review of literature

Chand *et al.* (2002) in their study the cost of cultivation of henna in Pal district of Rajasthan. The overall establishment cost of henna was Rs.15890 per hectare and ranged from Rs.15707 (small farmers) to Rs.16532 per hectare (medium farmers). The labour cost alone accounted for 55 per cent of the total establishment cost. Since especially skilled labour is required for it's transplanting. The expenditure on transplanting of seedlings and ploughing was 30 and 15 per cent, respectively. The overall recurring cost worked out was Rs.8464 per hectare with labour accounting for 94 per cent of the total cost.

Doke (2002) studied the "Economics of production and marketing of henna" in the agriculture year 1994-95. The study is exclusively based on primary data collected from Bhadravati Taluka of Chandrapur district of Maharashtra. Out of six villages 60 henna growing farmers were selected randomly on the basis of area under it. The average total per hectare cost of cultivation was Rs. 54249.00. It was observed that 67.54 per

cent (Rs.36637/ha) of the total cost was accounted for by cost 'A' (variable cost), 32.46 per cent (Rs.50470.15/ha) was imputed cost i.e. fixed cost and 6.93 per cent (Rs.3778.85/ha) as observed as the average value of unpaid family labour. A large portion of the total cost (as variable cost) i.e. 1/3 cost (Rs.17690.73 or 32.61%) was constituted by the cost of seed and ¼ cost (Rs.12852 or 23.69%) was constituted by cost of human labours. It may be concluded that henna cultivation is profitable under the existing farm level technology.

Khemchand *et al.* (2005) studied the economic viability of henna in semi-arid Rajasthan. The present study has assessed the profitability and economic viability of henna cultivation based on the data collected from a sample of 100 farmers during 2003-04 in the Pal district of Rajasthan. The total establishment cost (per ha) worked out for henna plantation was Rs. 30787 this implies that it is a highly capital intensive crop. In the total establishment cost, variable cost took a lion's share of 93.63 percent. The minimum net income required before replacement was Rs.30787 / ha and payback period was 8.5 years. The henna cultivation was found economically viable at the 10.5 per cent discount rate of terms of both NPV and BCR criteria, as NPV was positive and BCR was greater than one. The IRR estimated to be 22.68 per cent was the maximum paying capacity of the henna plantation. It seems that mehndi farming can add a new dimension in the national economy of Bangladesh.

Shah *et al.* (2006) studied the "Cost-benefit analysis of henna cultivation in middle Gujarat" and concluded that henna was a highly capital intensive crops and the average cost of cultivation estimates to Rs. 2,02,260 /hectare. The average cost was found as Rs.157368. Seed cost was found highest (Rs.64129/ha) and the net profit per hectare over cost C2 found to be as Rs. 1,80,338 with input output ratio as 1:1:97 on the basis of cost C2 for all the farms. The overall cost of production has been estimated as Rs. 1566 /q, which was much lower than the market price, 2000-5000 /quintal during the study period. This indicated that the henna cultivation was quite remunerative in the study area even at the lowest price.

Ahmed *et al.* (2008) in their study the mehndi leaf loses its freshness after 1 day, so it needs some extra care to store for long periods. Due to the lack of storage facilities, farmers sometimes face problems with unsold leaves. The respondents reported that middlemen, not the farmers themselves, make considerable profit from the farming. This is because of the existing poor marketing systems as well as the farmers' lack of marketing knowledge and market information. The small- scale nature poor financial position and scattered distribution of the farmers pose serious problems for marketing the products, marketing difficulties are a leading constraint to the development of such cottage enterprises as mehndi farming. With the increasing popularity of 'henna body art' in western countries, research is being carried out in mehndi producing countries to improve its quality in various aspects.

Pawar *et al.* (2008) concluded a study in economics of production and marketing of selected medicinal and aromatic plants in western Maharashtra. The item wise per hectare cost of cultivation of medicinal and aromatic plants. Total cost of cultivation of safe musali was the highest (Rs. 2,28,634.32) followed by mehndi (Rs. 1,03,567.19) and Citronella (Rs. 55,879.80). In the case of safe musali, the seed has alone contributed the highest share i.e. 46 per cent in the total cost of cultivation, while for mehndi; the human labour cost registered the higher share (about 29%) in the cost cultivation, which signaled as labour intensive crop. The yield obtained from safe musali, mehndi and citronella was 8.20, 250.13 and 425.87 quintal per hectare and per quintal price received was Rs. 32152 Rs. 435 and 147 for the respective crops.

Ram *et al.* (2012) studied the economics of production to marketing of aromatic crops in Uttar Pradesh. The economics of production of three medicinal and aromatic plants viz., mehndi, tulsi and vetiver has been worked out using farm level data from the districts of Barabanki, Sitapur and Raebareilly in Uttar Pradesh. The cultivation of these plant species has been found to highly profitable and farmers of these districts need to be made aware about this fact. The net returns over total cost have been found higher for vetiver (Rs.1,53,933/ha) followed by mehndi (Rs.53,250/ha) and tulsi (Rs. 40,094/ha). The benefit cost ratio however has been observed to be highest for mehndi (3.27), followed by tulsi (3.21) and vetiver (3.04). The employment generation potential of these three crops has also been found quite high.

#### 4. Methodology

This study was to investigate the existing of henna producers taluka Tharoshah district Naushero Feroze Sindh. Planned strategy was used to study the area, type and number of respondents without which it would be an ineffective effort. Therefore, it is essential to define variables included in the research to make it more scientific and objective.

##### 4.1. Study Area

This study was conducted on primary data collected from the henna producers in district Naushero Feroze. It was selected as the study because it represents study henna plant production activities. The district is gifted naturally with fertile soil.

#### 4.2. Sample Size

The sample was supposed to contain henna plant farmers. A sample size of 60 respondents was selected through random sampling.

#### 4.3. Data Collection

As described above, the data was collected from district Naushero Feroze Sindh, Villages and respondents from this area were randomly selected.

#### 4.4. Questionnaire Development

Interview schedule was based on a well designed questionnaire. Comprehensive information was obtained face to face from the farmers involved in tomato farming and the henna business and documented by the interviewer. Questionnaire was prepared in English language while the interview with respondents was done in local language i.e. Sindhi. Different features were covered in the questionnaire.

#### 4.5. Data Analysis

Collected data had both quantitative and qualitative information. For data analysis SPSS package were used.

#### 4.6. Descriptive Statistics

The data was categorized according to the study objectives, analyzed statistically and represented in tabular form. Statistical techniques that were used during data analysis are given below:

Averages

Percentages

##### 4.6.1. Averages

Averages were calculated by applying following formula:

$$\text{Average} = \sum Xi / n$$

Where,

$\sum Xi$  = sum of independent variables

n = number of observation in data

##### 4.6.2. Percentages

Percentage is the proportion of fraction articulated in hundredth. It was computed by

$$\text{Percentage} = F / N * 100$$

Where,

F = Respondents of desired class

N = Total number of respondents

#### 4.7. Land inputs

Land inputs were measured on the basis of area planted under various crops at the selected diversified farm. The main component of land input included the rent of land, irrigation charges and usher tax. Market rate of leasing out one acre of land for growing various crops/plants as prevalent in the area was considered as an appropriate criteria to compute rent of land inputs for various crops/plants.

Therefore actual area sown under henna plant was taken into consideration to determine the land resource use. The estimating land inputs for henna plant on the sample farms, the following formula was used:

$$\text{Lipa} = (\text{As} \times \text{Cr}) + (\text{As} \times \text{Ic}) + (\text{As} \times \text{Ut}) / \text{As}$$

Where;

Lipa = Land input per acre of henna plant

As = Area sown under henna plant

Cr = Contract rent per unit

Ic = Irrigation charges rate

Ut = Ushar tax rate

#### 4.8. Labour inputs

Labour inputs include machine use, manual and animals labour. The hiring of tractor along with implements and bullock pair including plough or leveler are prevailing in the area. Therefore; labour inputs as employed to grow various enterprises were estimated on the basis of opportunity cost principle. The following formula was used to calculate the labour inputs;

$$\text{Lih} = (\text{Mwh} \times \text{Hc}) + (\text{Bwd} \times \text{Hc}) + (\text{Mwd} \times \text{Wr}) / \text{As}$$

Where;

Lih = Labour input per unit of henna plant

Mwn=Machine work hour  
Hc=Hiring charges  
Mwd= Man work days  
Bwd= Bullock work day  
Wr=Wage rate  
As=Area sown under henna plants

The same equation was used for all the operation carrying out enterprises at the selected farm studies in the study area.

#### 4.9. Capital inputs

Capital inputs used in the various enterprises i.e. seed, farmyard manure, fertilizer, insecticides and pesticides. The actual expenditure as incurred by the respondents on these capital inputs was investigated from farmers and means were computed for all the farmers,. The following formula was used to compute capital inputs for various henna plants raised on the selected farms.

$$Cpa = (Qs \times Pr) + (Qm \times Pr) + (Qf \times Pr) + (Qi \times Pr) / As$$

Where;

Cpa=Capital inputs per acre of henna plant  
Qs=Quantity of seed used  
Pr=Price per unit of inputs  
Qf=Quantity of fertilizer  
Qi=Quantity of insecticides/pesticides  
Qm=Quantity of manure  
As=Area sown under henna plants

#### 4.10. Estimation of marketing cost

The henna plant producers in the study area incurred marketing costs on the disposal of the produce. Such costs were estimated for the quantity of produce they sold in the market by using the following formula:

$$Mc = Qm (Rl + Ru + Tr) / As$$

Where;

Mc=Marketing cost  
Qm=Quantity of produce marketed  
Rl=Rate of loading  
Ru=Rate of unloading of henna plant  
Tr=Transportation rate  
As=Area sown under henna plants

The farmer also paid commission charges to the commission agents for intermediary services extended in the disposal of produce at 8 percent of sale of produce. Thus the commission charges were estimated after investigating the revenue received.

#### 4.11. Estimation of returns

While the produce retained by farmers for their home consumption was valued at prices prevailing in the area. The quantity of henna marketed by the farmers was timed with prices they received at the time of disposal by using following formula:

$$VP = (Qs \times Pr) / As$$

Where;

Vp =Value of product  
Qs=Quantity sold  
Pr=Price per unit  
As=Area sown

### 5. Results

This chapter provides results of the study including current status of henna plant production practices and issues of henna farmers. Analysis and interpretation of data are the most important step in scientific research. Without these steps generalization and prediction cannot be achieved which is the target of scientific research. Generalization and conclusion are drawn on the basis of characteristics and attitudes of the respondents.

#### 5.1. Age

Age is very important demographic factor which influences. The efficient allocation of resources it shows the ability to do work efficiency willingness to make progress and attitude towards various social and economic

aspects of life age can be defined as total number of completed years since birth of a person.

**Table 1: Distribution of the respondents according to their age**

Age	No. of respondents	Percentage
21-30 years	16	26.66
31-40 years	12	20.00
41-50 years	20	33.33
50 and above years	12	20.00
Total	60	100.00

Table-1 shows that majority 33.33 percent henna plant growers belonged age group of 41-50 years, 26.66 percent growers belonged age group of 21-30 years, 20.00 percent growers belonged age group of 31-40 years and above while 20.00 percent growers belonged age group of 50 and above years.

### 5.2.Literacy level

Education expands knowledge and other wanted qualities of mind and general capability, especially by means of formal schooling.

**Table 2: Distribution of the respondents according to their literacy level**

Literacy level	No. of respondents	Percentage
Illiterate	22	36.66
Primary	15	25.00
Middle	12	20.00
Metric and above	11	18.33
Total	60	100.00

Table-2 shows that majority 36.66 percent henna plant growers were illiterate, 25.00 percent having primary level of education, 20.00 percent henna plant growers were middle education and 18.33 percent having metric and above of education .

### 5.3. Farming experience

Farming experience has its impacts on the farm production. With the passage of time a person gains experience and gets well familiar to the utilization of resources and the conditions of farm and output markets.

**Table 3: Distribution of the respondents according to their farming experience**

Farming experience	No. of respondents	Percentage
1 to 10 years	18	30.00
11-25 years	27	45.00
26 and above years	15	25.00
Total	60	100.00

Table-3 shows that majority 45.00 percent henna plant growers have 11-25 years farming experience followed by 30.00 percent henna plant growers have 1 to 10 years and remaining 25.00 percent henna plant growers have 26 and above years henna farming experience in the study area.

### 5.4. Farm tenancy status

In our country mostly the types of land tenures are owner, owner-cum tenants and tenants.

**Table 4: Distribution of the respondents according to their tenancy status**

Tenancy status	No. of respondents	Percentage
Tenant	23	38.33
Owner	37	61.66
Total	60	100.00

Table-4 shows that a majority 61.66 percent henna plant growers have owner and only 38.33 percent henna plant growers have tenant in the study area.

### 5.5.Farm size

The size of land holding refers to the piece of land cultivated by a farmer and his family.

**Table 5: Distribution of the respondents according to their total area of the land**

Farm size (acre)	No. of respondents	Percentage
1 to 10	34	56.66
11-20	23	38.33
Above 20	03	5.00
Total	60	100.00

Table-5 shows that majority 56.66 percent henna plant growers have 1 to 10 acre of land, 38.33 percent

henna plant growers have 11-20 acre of land and remaining 5.00 percent henna plant growers have above 20 acre of land in the study area.

### 5.6. Occupation

**Table 6: Distribution of the respondents according to their occupation**

Occupation	No. of respondents	Percentage
Farming	45	75.00
Labour	6	10.00
Job/business	9	15.00
Total	60	100.00

Table-6 shows that there were 75.00 percent henna plant growers were engaged in farming, 10.00 percent henna plant growers have were engaged in labour and 15.00 percent henna plant growers have were engaged in the job/ business like having shopkeeper, govt. job and private jobs in the study area.

### 5.7. Irrigation Source

**Table 7: Distribution of the respondents according to their irrigation Source**

Irrigation Source	No. of respondents	Percentage
Canal	49	81.66
Tube well	11	18.33
Total	60	100

Table-7 shows that 81.66 percent henna plant growers were used canal water and only 18.33 percent henna plant growers were used tube well water in the study area.

### 5.8. Fixed Cost

Fixed costs are expenses that are not dependent on the level of goods or services produced. They tend to be time-related, such as tax, rents being paid per month/year, and are often referred to as overhead costs.

**Table 8: Per acre incurred on fixed costs of henna farmers**

Operations	Quantity (No.)	Rate (Rs.)	Total cost (Rs./ acre)
Zari tax and Usher	-	700.00	700.00
Rent of land	-	12000.00	12000.00
Total			12700.00

Table-8 shows that the Rs.12700.00 on an average per/acre area of fixed cost which includes on an average per acre henna plant growers spent for zari tax and usher Rs.700.00 and rent of land Rs. 12000.00 in study area.

### 5.9. Land development cost

**Table 9: Per acre incurred on land development cost of henna farmers**

Operations	Quantity (No.)	Rate (Rs.)	Total cost (Rs./ acre)
Ploughing	3	1150.00	3450.00
Land leveling	2	1250.00	2500.00
Ridge making	1	1200.00	1200.00
Total			7150.00

Table-9 shows that the Rs.7150.00 on an average per/acre area of land development cost which includes on an average per acre henna plant growers spent for PloughingRs.3450.00, land leveling Rs.2500.00 and ridge making Rs.1200.00 in study area.

### 5.10. Labour cost

A labour input refers to all outlays incurred to engage labour for production.

**Table 10: Per acre expenditure incurred on labour cost of henna farmers**

Operations	Quantity (No.)	Rate (Rs.)	Total cost (Rs./ acre)
Nursery management	7	300.00	2100.00
Transplanting	4	300.00	1200.00
Urea and FYM application	5	300.00	1500.00
Harvesting	20	300.00	6000.00
Threshing by hand	8	300.00	2400.00
Total			13200.00

Table-10 shows that the Rs.13200.00 on an average per/acre labour cost which includes on an average per acre henna plant growers spent for nursery management Rs.2100.00, transplanting Rs.1200.00, urea and

FYM application Rs.1200.00, harvesting Rs.6000.00 and threshing by hand Rs.2500.00 in study area.

### 5.11. Marketing Costs

The marketing cost may include expenses associated with transferring title of goods to a customer, storing goods in warehouses, promoting the goods or services.

**Table 11: Per acre expenditure incurred on marketing cost of henna farmers**

Operations	Quantity (No.)	Rate (Rs.)	Total cost (Rs./ acre)
Packing	-	300.00	300.00
Loading	3	300.00	900.00
Transporting	2	2800.00	5600.00
Unloading	3	300.00	900.00
Total			7700.00

Table-11 shows that the Rs.7700.00 on an average per/acre area of marketing cost which includes on an average per acre henna plant growers spent for packing Rs.300.00, Loading Rs.900.00, Transporting Rs. 5600.00 and Loading Rs.900.00 in study area.

### 5.12. Input costs

Input cost measures the services derived from the stock of physical assets used in production. The assets included are fixed business equipment, structures and inventories.

**Table 12: Per acre expenditure incurred on Input costs of henna farmers**

Operations	Quantity (No.)	Rate (Rs.)	Total cost (Rs./ acre)
Seed (Kg)	18	8.00	144.00
FYM (Trolley)	3	2300.00	6900.00
Urea	2	3800.00	7600.00
DAP	1	4800.00	4800.00
Tube well	-	5000.00	5000.00
Weedicied	1	700.00	700.00
Packing bags	100	10	1000.00
Total			26444.00

Table-12 shows that each selected henna grower of the study area on an average per acre of henna spent a sum of Rs.26444.00 that included Rs.144.00, Rs.6900.00, Rs.7600.00, Rs.4800.00, Rs.5000.00, Rs.700.00 and Rs.1000.00 on Seed (Kg), FYM (Trolley), Urea, DAP, Tube well , Weedicied and Packing bags respectively.

### 5.13. Total Cost of Production

TCP defined as sum of fixed cost plus variable costs make the total cost of production.

**Table 13: Per acre total cost of production of henna farmers**

Particulars	Mean
Fixed cost	12700.00
Land development cost	7150.00
Labour cost	13200.00
Marketing Costs	7700.00
Input costs	26444.00
Total	67194.00

Table-13 shows that the selected henna grower in the study area on average per acre spent a total cost of production of Rs.67194.00. This included Rs.12700.00, Rs.7150.00, Rs.13100.00, Rs.7700.00 and Rs.26444.00 on fixed cost, land development cost, marketing costs and input costs respectively.

### 5.14. Physical Productivity

The yield when expressed in terms of physical weight is known as physical productivity.

**Table 14: Per acre physical productivity of henna farmers**

Particulars	Mean
Henna leaf	76 Mds
Total	76 Mds

Table-14 shows that the result each henna grower of Tharoshah district Naushahero Feroze Sindh area obtained per acre 76 Mds on an average.

### 5.15. Revenue productivity

The value of farm production of gross profit it refers to money income accruing to the farmers from the sale of their production. It is calculated by multiplying the physical productivity (yield) obtained with the price, it is



sold.

**Table 15: Per acre revenue productivity of henna farmers**

Particulars	Quantity Mds	Price Rs. /Mds	Total
Henna leaf	76	1600.00	121600.00

Table-15 depicted that each selected henna growers of taluka Tharoshah district Naushahero Feroze Sindh area on revenue per acre earned of Rs.121600.00 that obtained by the grower of henna.

### 5.16. Net Income

Net income is gross profits remains cash operating expenses and depreciation cost of machinery and equipments costs could be obtained by subtracting the gross revenue from cash operating expenses. Net income Averages output or gross income after subtracting all farm expenses.

**Table 16: Per acre net income of henna farmers**

Particulars	Mean
Gross Income (Rs) A	121600.00
Total Expenditure (Rs) B	67194.00
Net Income (Rs) A-B=C	54406.00

Table-16 shows that the henna growers on an average per acre earned during study, Rs.54406.00 on net income, Rs.121600.00 on gross income and Rs.67194.00 on total expenditure in taluka Tharoshah district Naushahero Feroze Sindh.

### 5.17. Input – Output ratio

The input-output ratio is calculated by dividing total income with the total cost of production.

**Table 17: Per acre input-output ratio of henna farmers**

Area sown	Gross Income(Rs.)	Total Expenditure(Rs.)	Input-output ratio
Acre	(A)	(B)	A/B=C
1	121600.00	67194.00	1:1.80

Table-17 showed that the selected henna growers on an average per acre gross income Rs.121600.00 and total expenditure is Rs.67194.00 in the study area therefore they availed input output ratio of 1:1.80 from henna growing in taluka Tharoshah district Naushahero Feroze Sindh.

### 5.18. Cost Benefit ratio

The cost benefit ratio refers to net returns as compared to the cost of production. It is calculated by dividing net returns with cost of production.

**Table 18: Per acre cost benefit ratio of henna farmers**

Area sown	Net income(Rs.)	Total Expenditure(Rs.)	Input-output ratio
Acre	(A)	(B)	A/B=C
1	54406.00	67094.00	1:0.80

Table-18 showed that the selected henna growers on a net income per acre earned Rs.54406.00 and total expenditure Rs.67094.00 in the study area therefore they availed input output ratio of 1:0.80 from henna growing in taluka Tharoshah district Naushahero Feroze Sindh

## 6. Discussion

In this study, identified a number of factors that believed would be important in determining the henna farming area of taluka Tharoshah district Naushahero Feroze Sindh. The results are indicating that proposed model provides an acceptable fit on the data.

The economic analysis describes the methods used in analyzing economic behavior and the application of the results obtained to solve economic problems. Economic analysis became sterile as did mere logic-consistency theorems dealing with general equilibrium, aggregate production functions and social welfare functions, devoid of any empirical content “OR” relevance (Marshall, 1999).

Shah *et al.* (2006) studied the “Cost-benefit analysis of henna cultivation in middle Gujarat” and concluded that henna was a highly capital intensive crops and the average cost of cultivation estimates to Rs. 2,02,260 /hectare. The average cost was found as Rs.157,368. Seed cost was found highest (Rs.64129/ha) and the net profit per hectare over cost C2 found to be as Rs. 1,80,338 with input output ratio as 1:1:97 on the basis of cost C2 for all the farms. The overall cost of production has been estimated as Rs. 1566 /q, which was much lower than the market price, 2000-5000 /quintal during the study period. This indicated that the henna cultivation was quite remunerative in the study area even at the lowest price.

The object of economic analysis is to verify the use of various inputs of production and income

incurred. There are many economic measures to determine the profitability of farm business. Yet, none of them is perfectly suitable for all the time and for all purposes, some criteria are most suitable to derive certain conclusions. The most important criteria which are commonly used to analyze efficiency of agricultural enterprise are consumption of net returns and determination of input-output ratio. These criteria were used to determine the input-output analysis of henna production around in taluka Tharoshah district Naushahero Feroze Sindh.

The results of present study conducted to determine the majority 33.33 percent henna plant grower's belonged age group of 41-50 years, 26.66 percent growers belonged age group of 21-30 years, 20.00 percent growers belonged age group of 31-40 years and above while 20.00 percent growers belonged age group of 50 and above years. Literacy status of the educational level of selected rearers were analyzed and found that 36.66 percent henna plant growers were illiterate, 25.00 percent having primary level of education, 20.00 percent henna plant growers were middle education and 18.33 percent having metric and above of education in the study area.

In this study the categories were formed for the farming experience of selected farmers were analyzed and found that 45.00 percent henna plant growers have 11-25 years farming experience followed by 30.00 percent henna plant growers have 1 to 10 years and remaining 25.00 percent henna plant growers have 26 and above years henna farming experience in the study area. In this study there were 75.00 percent henna plant growers were engaged in farming, 10.00 percent henna plant growers have were engaged in labour and 15.00 percent henna plant growers have were engaged in the job/ business like having shopkeeper, govt. job and private jobs in the study area.

In this study the 81.66 percent henna plant growers were used canal water and only 38.33 percent henna plant growers were used tube well water in the study area. An average per/acre area of fixed cost the Rs.12700.00 on which includes on an average per acre henna plant growers spent for zari tax and usher Rs.700.00 and rent of land Rs. 12000.00. And Rs.7150.00 on an average per/acre area of land development cost which includes on an average per acre henna plant growers spent for Ploughing Rs.3450.00, land leveling Rs.2500.00 and ridge making Rs.1200.00 in study area.

The labour cost on an average per/acre Rs.13200.00 which includes on an average per acre henna plant growers spent for nursery management Rs.3450.00, transplanting Rs.2500.00, urea and FYM application Rs.1200.00, harvesting Rs.6000.00 and threshing by hand Rs.2500.00 in study area. Marketing cost on an average per/acre Rs.7700.00 which includes on an average per acre henna plant growers spent for packing Rs.300.00, Loading Rs.900.00, Transporting Rs. 5600.00 and Loading Rs.900.00 in study area. The study area on an average per acre of henna spent a sum of Rs.26444.00 that included Rs.144.00, Rs.6900.00, Rs.7600.00, Rs.4800.00, Rs.5000.00, Rs.700.00 and Rs.1000.00 on Seed (Kg), FYM (Trolley), Urea, DAP, Tube well, Weedicid and Packing bags respectively. The selected henna grower in the study area on average per acre spent a total cost of production of Rs.67194.00. This included Rs.12700.00, Rs.7150.00, Rs.13100.00, Rs.7700.00 and Rs.26444.00 on fixed cost, land development cost, marketing costs and input costs respectively. Thus the henna growers in Tharoshah district Naushahero Feroze Sindh area obtained per acre 76 mounds on an average and revenue per acre earned of Rs.121600.00 that obtained by the grower of henna. The henna growers on an average per acre earned during study, Rs.54406.00 on net income, Rs.121600.00 on gross income and Rs.67194.00 on total expenditure in taluka Tharoshah district Naushahero Feroze Sindh.

Thus the henna growers in Tharoshah district Naushahero Feroze Sindh area on a gross income Rs.121600.00 and total expenditure is Rs.67194.00 in the study area therefore they availed input output ratio of 1:1.80 and a net income per acre earned Rs.54406.00 and total expenditure Rs.67094.00 in the study area therefore they availed input output ratio of 1:0.80 respectably.

## 7. Conclusion

The research study on Economic analysis of henna cultivation and its marketing in taluka Tharoshah district Naushahero Feroze Sindh was concluded for the findings during study were the most efficient to cultivate the henna at remunerative level. The agricultural infrastructure is the web of personal, economic, social and legal relationships that support the production of agricultural commodities. It includes, most visibly, agricultural input suppliers and output processors. However, it also includes the formal and informal business relationships between individual farms. Infrastructure provides access to input and output markets, access to agricultural services ranging from continuing education to consulting, as well as including institutional arrangements, such as the legal and monetary systems.

In district Naushahero Feroze Sindh is fertile in agricultural production. Thus, the district can have a potential to produce more henna plants for demand, there is also need for study the efficient henna plants production practices and issues in the production process for policy making.

- Awareness should be created among the farming through media and extension services regarding scientific farming of henna plants.

- Processing and manufacturing plants should be installed for easy access of the farmers.
- Market infrastructure should be improved through setting up of facilities and Farmers must themselves take up the task of marketing henna in the nearby wholesale market than giving it to pre-harvest contractors which will help them in enhancing their income.
- A marketing need to be established exclusively for the marketing of henna to rescue the farmers from the exploitation by the pre-harvest contractors.
- The state government should give due attention for providing proper approach roads to the villages, and also providing scientific storage facilities to help the farmers.
- Value addition and export promotion, particularly of henna are drawing due attention of the developmental agencies in Pakistan.

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