**Impact of Front Line Demonstration for Ensuring Household Nutritional Security through Drumstick plant**

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**Abstract**

Krishi Vigyan Kendra carried out some interventions for creating awareness about the use of drumstick plant for nutritional security. After the two year of intervention a survey was planned with the objectives ;i)to know the impact of demonstration on the awareness about the uses of drumstick plant, ii)to know the impact of demonstration on the consumption of drumstick plant part for nutritional security, and iii) to know the impact of demonstration on the consumption of drumstick plant part for family. The demonstration was carried out in ten villages (Premwalia, lakshmipur, Amwadeegar, Piperaghat,Davnaha,Devipur,Dhuria Kot,Bahnauli,Persaun,Padri piperpati) of five blocks (Kasia, Dudahi, Seorahi, Tamkuhi Raj & Bishunpura) of the district Kushinagar in the year 2017-18 and in fourteen villages(Dhaurahara,Lachia devariya, Gazipur,Naugavan, saphi tadwa,bhatwalia, Sumuhi Mohan singh, gosai patti, Sohnariya,Persauna,Ramsagra, rakba dulma patti,Ajay nagar,Babuyia herpur) of six blocks (Fazil nagar, Tamkuhi Raj, Padrauna, Dudahi, Seorahi & Bishunpura) of the district Kushinagar in the year 2018-19.The result indicated that average per head consumption of green leaves was 32.5g/day , average consumption of leaves per family was 135g/family/day and the average Consumption of pods per familywas 6.1kg .It was also found that the most useable drumstick plant part was the pods which was used by 99.83 % farm families as it ranked Ist in the consumption by farm families.

**Keywords**; drumstick, nutritional security, malnutrition

**Introduction**

Drumstick is the member of Moringaceae family, having the scientific name *Moringa oleifera .*Drumstick has been proved to be an effective and sustainable remedy for malnutrition due to its easily cultivable capacity and nutritional sufficiency. Drumstick plant is rich in nutrition owing to the presence of a variety of essential phytochemicals present in its leaves, pods and seeds. Countries like Africa, Senegal and Benin treat malnourished children with Moringa **(Kasolo *et al*,2010).**Drumstick is rich in phytosterols like stigmasterol, sitosterol and kampesterol, precursors for hormones and increase the estrogen production which in turn stimulates the proliferation of the mammary gland ducts to produce milk and cure the malnutrition of children due to deprivation of breast milk. It is used to treat malnutrition in children younger than 3 years**(Titi *et al*,2013)** Considering the profitability and importance of the drumstick plant, Krishi Vigyan Kendra carried out some interventions for creating awareness about the use of drumstick plant for nutritional security. After the two year of intervention a survey was planned with the following objectives:

**Objective**

-to know the impact of demonstration on the awareness about the uses of drumstick plant

-to know the impact of demonstration on the consumption of drumstick plant part for nutritional security

- to know the impact of demonstration on the consumption of drumstick plant part for family

**Methodology**

Krishi Vigyan Kendra (ICAR-IIVR,Varanasi)Kushinagar conducted various training programmes & extension activities to aware farming community about the nutritional and medicinal value of drumstick plant and through survey the awareness about drumstick plant was assessed(table-1).

**Table 1;Awareness about the drumstick plant among farm families (n=600)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S.No. | Particulars | No Awareness | | Some what Awareness | | Complete Awareness | |
|  |  | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage |
| 1. | General Use of | | | | | | |
|  | Plant | 559 | 93.16 | 27.00 | 4.50 | 14.0 | 02.34 |
|  | Leaves | 598 | 99.66 | 02.00 | 0.34 | 00.0 | 00.00 |
|  | Seeds | 600 | 100.0 | 00.00 | 0.00 | 00.0 | 00.00 |
|  | Poda | 589 | 98.16 | 09.00 | 1.50 | 02.0 | 00.34 |
| 2. | Medicinal uses of | | | | | | |
|  | Plant | 574 | 95.66 | 22.00 | 3.66 | 04.0 | 00.66 |
|  | Leaves | 600 | 100.0 | 00.00 | 0.00 | 00.0 | 00.00 |
|  | Seeds | 597 | 99.50 | 03.00 | 0.50 | 00.0 | 00.00 |
|  | Poda | 566 | 94.33 | 21.00 | 3.50 | 13.0 | 20.16 |
| 3. | Nutritional uses | | | | | | |
|  | Plant | 599 | 99.83 | 01.00 | 0.17 | 00.0 | 00.00 |
|  | Leaves | 600 | 100.0 | 00.00 | 00.0 | 00.0 | 00.00 |
|  | Seeds | 589 | 98.16 | 09.00 | 01.5 | 02.0 | 00.34 |
|  | Poda | 567 | 94.50 | 31.00 | 5.16 | 02.0 | 00.34 |
| 4. | Culinary uses of | | | | | | |
|  | Leaves | 599 | 99.83 | 001.0 | 0.17 | 00.0 | 00.00 |
|  | Pods | 119 | 19.83 | 102.0 | 17.0 | 379 | 63.16 |
| 5. | Leaves As a animal feed | 600 | 100.0 | 00.00 | 0.00 | 0.00 | 00.00 |
| 6. | Leaves As a material for compost | 593 | 98.83 | 06.00 | 10.0 | 01.0 | 00.17 |

After the survey the front line demonstration on drumstick sapling plantation was carried out in randomly selected villages from the purposively selected blocks of the district. The district was also selected purposively for demonstration The demonstration was carried out in ten villages (Premwalia, lakshmipur, Amwadeegar, Piperaghat,Davnaha,Devipur,Dhuria Kot,Bahnauli,Persaun,Padri piperpati) of five blocks (Kasia, Dudahi, Seorahi, Tamkuhi Raj & Bishunpura) of the district Kushinagar in the year 2017-18 and in fourteen villages(Dhaurahara,Lachia devariya, Gazipur,Naugavan, saphi tadwa,bhatwalia, Sumuhi Mohan singh, gosai patti, Sohnariya,Persauna,Ramsagra, rakba dulma patti,Ajay nagar,Babuyia herpur) of six blocks (Fazil nagar, Tamkuhi Raj, Padrauna, Dudahi, Seorahi & Bishunpura) of the district Kushinagar in the year 2018-19.The data were collected on the consumption of drumstick plant’s part for household security in the year 2020-21. Economics of the demonstration was as follows(table2);

**Table 2; Economics of the front line demontration on drumstick**

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Particulars | 2017-18 | 2018-19 |
| 1. | Cost | 400 | 400 |
| 2. | Gross Return | 780 | 810 |
| 3. | Net Return | 380 | 410 |
| 4. | B:C ratio | 1.95:1 | 2.02:1 |

**Result & Discussion**

**1.Impact of demonstration on the awareness about the uses of drumstick plant**; the data presented in table 3 showed a positive increment in awareness about the uses of drumstick plant. Before demonstration only 04.34% farm women were aware about the benefits of drumstick plant and their parts as twenty five farm women out of 600 respondents was aware but after the kvk interventions like training, demonstration and extension activities 88.14% farm women/ families became aware about the uses of drumstick.The total increase of 83.79% in awareness was observed.

**Table 3;Impact of demonstration on the awareness about the uses of drumstick plant (n=600)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Before Demonstration | | After Demonstration | | Increase in Awareness |
|  |  | Frequency | Percentage | Frequency | Percentage | Percentage |
| 1. | General Use of |  |  |  |  |  |
|  | Plant | 0.14 | 02.34 | 508 | 84.66 | 82.32 |
|  | Leaves | 00.0 | 00.00 | 491 | 81.83 | 81.83 |
|  | Seeds | 00.0 | 00.00 | 207 | 34.50 | 34.50 |
|  | Poda | 02.0 | 00.34 | 581 | 96.83 | 96.49 |
| 2. | Medicinal uses of |  |  |  |  |  |
|  | Plant | 04.0 | 00.66 | 537 | 89.50 | 88.84 |
|  | Leaves | 00.0 | 00.00 | 526 | 87.66 | 87.66 |
|  | Seeds | 00.0 | 00.00 | 573 | 95.50 | 95.50 |
|  | Poda | 13.0 | 02.16 | 591 | 98.50 | 96.34 |
| 3. | Nutritional uses |  |  |  |  |  |
|  | Plant | 00.0 | 00.00 | 501 | 83.50 | 83.50 |
|  | Leaves | 00.0 | 00.00 | 566 | 94.33 | 94.33 |
|  | Seeds | 02.0 | 00.34 | 541 | 90.16 | 89.82 |
|  | Poda | 02.0 | 00.34 | 586 | 97.66 | 97.32 |
| 4. | Culinary uses of |  |  |  |  |  |
|  | Leaves | 00.0 | 00.00 | 521 | 86.83 | 86.83 |
|  | Pods | 379 | 63.16 | 569 | 94.83 | 31.67 |
| 5. | Leaves As a animal feed | 0.00 | 00.00 | 574 | 95.66 | 95.66 |
| 6. | Leaves As a material for compost | 01.0 | 00.17 | 590 | 98.33 | 98.16 |
|  | **Mean** | **25.196** | **04.34** | **528.87** | **88.142** | **83.79** |

**2.Impact of demonstration on the consumption of drumstick plant part for nutritional security;**the data revealed that total 609 demonstrations were conducted in which 800 drumstick plants were planted.The data (table 4 )showed that average per head consumption of green leaves was 32.5g/day which was 25g/day in year 2017-18 and 40 g/day in year 2018-19.It was also observed that average consumption of leaves per family was 135g/family/day which was125 g/day in the year2017-18 and 145g/day in the year 2018-19.The average Consumption of pods per familywas 6.1kg which was 5kg/day in the year2017-18 and 7.2kg/day in the year 2018-19.The finding were in agreement with the results given by**Seshadri & Nambiar(2003).**They found that drumstick leaves had great potential to be used for human consumption but were not sold.

**Table 4; Impact of demonstration on the consumption of drumstick plant part for nutritional security**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.No. | Particulars | 2017-18 | 2018-19 | Total | Mean |
| 1 | No of Demonstration of Drumstick  (Variety- PKM-1) | 359 | 250 | 609 | 304.5 |
| 2 | No,of saplings planted | 500 | 300 | 800 | 400 |
| 3 | Area Covered | 0.8 ha | 0.48 ha | 1.28 | 0.64 |
| 4 | Consumption of leaves per head | 25 g/day | 40 g/day | 65 g/day | 32.5 g/day |
| 5. | Consumption of leaves per family/day | 125 g/day | 145g/day | 270 | 135 |
| 6. | Total consumption of leaves in four months | 16.8 kg | 17.55 kg | 34.35 kg | 17.17 kg |
| 7. | Saving in money spent on purchasing of green leafy vegetable | 25% | 10% | 35 | 17.5 |
| 8. | Consumption of pods per family | 5kg/plant | 7.2kg/plant | 12.2 kg/plant | 6.1 kg/plant |
| 9. | Use for animal fodder | 400 g/day | 300 g/day | 700 g/day | 350 g/day |
| 10. | Use for compost making | 50.34 kg | 61.22 kg | 111.56 kg | 55.78 kg |

**3.Impact of demonstration on the consumption of drumstick plant part for family;**the data given in table depicted that the most useable drumstick plant part was the pods which was used by 99.83 % farm families folllowed by leaves used for nutritional purpose and culinary purposes i.e.,98.03% & 96.71%.The use of leaves was also supported by the findings given by **Nambiar(2003)**&**Gopalkrishnan *et a*l.,(2016)**.He stated that leaves are rich in minerals,vitamins and other essential phytochemicals.

**Table 5; Impact of demonstration on the consumption of drumstick plant part for family consumption**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.No.** | **Use of plant part** | **For Family Consumption(n=609)** | | **Rank** |
|  |  | Frequency | Percentage |  |
| 1. | Leaves for nutritional security | 597 | 98.03 | Iind |
| 2. | Leaves for medicinal purposes | 322 | 52.87 | Vith |
| 3. | Leaves for culinary purposes | 589 | 96.71 | IIIrd |
| 4. | Leaves for animal feed | 561 | 92.11 | Vth |
| 5. | Leaves for composting | 573 | 94.09 | Ivth |
|  | Pods for culinary purposes | 608 | 99.83 | Ist |
| 5. | Seeds for water purification | 201 | 33.01 | VIIth |

It may be concluded from the ongoing discussion that the drumstick leaves are rich in different nutrients .Extracts from the leaves Nutrients of the drumstick trees are exploited for a variety of purposes. More studies are needed to corroborate the primary mechanism of moringa as anti diabetic and anti cancer agents. The tree as a native to India can become a great source of income for the people if this potential for highly nutritional food is exploited to corroborate earlier studies. In the country ,the demand for snacks in the market is huge, therefore, drumstick leaves fortification in snacks to eradicate malnutrition has a twin advantage.

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