Case study of women empowerment through transforming *Citrullus colocynthis*, a wild fruit from non-edible to edible

Singh Pratiksha, Singh Om, Raman Jodha, Singh Rahul Km and Singh Richa

Abstract
The case study of Dhapi devi was conducted in village Aaspalsar of block Sardarshahr. She was a trainee of KVK Sardarshahr who wishes to learn in such a way that she can make herself empowered and independent of family for basic things. She, somehow managed to learn it from KVK Sardarshahr and keep coming and calling scientists at her place to know procedure of making tumba pickle which is non-edible wild fruit. With the help of scientist she learns process of making tumba pickle in two phases, consumes almost 20-30 days to remove bitterness of this wild fruit. Once she get confident about whole process of removing bitterness as well as making tumba pickle she herself explores to make different items out of it. Now a day she is among expert of making tumba items (pickle, churna, pesticide etc.) in her village and near areas. She is earning Rs 25000 PA. She is teaching other ladies of village for the same and empowering them.

Keywords: women empowerment, transforming, edible, *Citrullus colocynthis*

Introduction
Situation analysis/ problem statement
Churu is a city in the desert region of Rajasthan. It is known as gateway to the Thar Desert of Rajasthan. It lies in the Thar Desert on the National Highway- 65 connecting Pali to Ambala and is a junction station on the railway line to Bikaner. Churu is a district with an enchanting topography amidst the Thar Desert. The Churu City is encircled by large shifting sand dunes of Thar. One can find Sand dunes all over the area with a couple of small limestone hills.

The town gets drinking water from local wells which are hard and brackish. The town area drinking water supply is managed by water department of Government of Rajasthan. The Government is trying to get drinking water for the area from Indira Canal. The main source of irrigation for farmers continues to be rain water and wells at a few places.

The area is scantly in vegetation. Phoge and Kair bushes and Khejri/Khejra (Prosopis irri) major crop production of the area are Wheat (60,654 tonnes), Rapeseed and Mustard (24,705 tonnes), Pulses (9,594 tonnes), Gram (316 tonnes), Bajra (2545467 tonnes).

*Tumba*, is a weed found in plenty with many common names including colocynth, bitter apple, bitter cucumber, desert gourd is a desert plant. It resembles a common watermelon vine, but bears small, hard fruits with a bitter pulp. It originally bore the scientific name *Colocynthis citrullus*. *Colocynthis citrullus* is that bitter in taste which cannot be consumed raw but it has high medicinal value. In India it is utilized as a part of conventional medication for hack, frosty and agonizing swellings and skin ejections, as an antipyretic. Plant mollifies vitiated kapha, pitta, irritation, skin maladies, worm’s infestation and joint pain. The plant is accounted for to have wound - recuperating properties. It can be utilized as a solution for eye grumbling. Plant has bug appalling properties. Its flowers are esteemed as stimulant, expectorant, aperients (tending gently to fortify the inside, diuretic), diaphoretic (the ability to bring about expanded sweat), bug spray and emmenagogue (a specialists that invigorates the menstrual stream). The fruits are widely used medicinally, especially for stomach pains the pulp, because of its content of glucosides such as colocynthin, is an effective cathartic and laxative (Dan et al., 1998) [4].

Antioxidants act as a major defence mechanism by protecting the damages caused by free radicals.
So drugs or products which contain antioxidants are getting increased focus in the last few decades for the prevention and treatment of complex diseases like, diabetes, Alzheimer’s disease and cancer (Devasagayam et al., 2004) [3]. This has attracted a great deal of research interest in natural antioxidants. Moreover, accessibility and affordability of the medicinal plants have made them vital part of many people’s life all around the world and the selection of medicinal plants is a conscious process, which has led to an enormous number of medicinal plants being used for the treatment of various diseases (Kim et al., 2007) [3].

It is a desert creeper which spreads rapidly after monsoon on the desert land. Its fruits are available in the month of October and November. It is one of the important cucurbits having better xerophytes adaptation, found in warmer climate and tropical areas.

Tumba is an herbaceous weed with great therapeutic value. It is grown in huge amount in arid region s. However, it is an under-utilized crop due to the bitterness it possesses, which makes it unacceptable for consumption. Tumba is perennial, trailing, scabrid herb belonging to the family cucurbitaceae. It continues for 3 to 5 years after establishment. It is a native of Africa, but is now found through our country. It is one of the important cucurbits having better xerophytic adaptations which are of more economic importance and hence it has been recommended for introduction and domestication in the Indian desert (Singh, 1964) [6].

Though it has great medicinal value and is also a good source of protein and fat, but is still an under-utilized fruit due to its bitter taste. Thus, the present study was undertaken to standardize the processing technique to reduce its bitterness and motivate its utilization in the community.

Dhapi Devi (62 years) wife of Shri Tarachand Meghwal is schedule caste, illiterate women belongs to village aaspalsar, tehsil sardarshahr. She has small piece of un-irrigated land where she with her family cultivate some of crops and seasonal vegetables for their survival. Cultivating crops (rabi/ kharif), is so tedious task to her as there is lack of resources to her, so basically she is focused on vegetable production so that she and her family can have atleast two times of meal. The green fruits are fed to animals and the matured yellow fruits are picked, dried and threshed for seed purpose. Air dried fruit yield of 120 to 150 q ha-1 and a mean seed yield of 450 kg ha-1 can be obtained by better management practices. The fruits are used as a feed for cattle, goats and camels. In a study tumba cake was fed every day to cows @25% of concentrate allocation for 37 days and no adverse effect of it on milking cows was noticed up to this level. The seeds are buried in common salt to wash off their bitter principles, ‘dried, mixed with pearl millet seeds and flour and eaten by the rural poor in scarcity periods.

Plan, implement and support

Dhapi Devi, while her agricultural practices found majority of weed tumba in his small piece of land. Many times she uses to remove that and throw it out but many of times she use to collect it for her cows. Asking about why she is giving tumba to animals she said it is good for animal’s health. Tumba remove their problem of constipation and prevent them from dehydration and as we know churu is place of extreme temperature, tumba is highly beneficial to this place. Once during OFF campus training of KVK scientist went to her lace where it was found that Dhapi Devi has huge stock of tumba which she collected for the purpose of animal use during off season. Asking about how she will preserve it, she said she has nothing instead of spreading it in cold room and allow it to dry. The only care she can take is to have regular watch so that tumba doesn’t get spoiled. She has no other option to raise tumba’s shelf life.

Although it was good effort from an uneducated, aged women at village level but it cannot be continue like this hence scientist decide to educate ladies of aaspalsar village (including dhapi devi) about value addition of tumba and its different products. Team has decided to conduct an ON campus training at KVK. Here beneficiaries were taught about making pickle, churna and other value added products of tumba. Here was the problem that training cannot be conducted in one training programme removing bitterness of tumba itself takes time of fifteen to twenty days. So training was planned two phases. During first training tumba will be prepared to make pickle out of it by removing its bitterness and during second training pickle will be prepared. Only few plants of selected families are well adapted to the xeric conditions of the desert. One of these families is cucurbitaceae to which belong tumba, mateera, kachra, etc., which are some of the naturally and commonly occurring plants of the Indian desert. The least exploited among these desert cucurbits is tumba, although it has a potential for varied uses. A general understanding of various aspects like habit, botanical characters, agronomic practices and uses of tumba may help in usefully exploiting this cucurbt of the Indian desert. (CAZRI, Jodhpur)

As per prepared schedule, trainings were conducted at KVK sardarshahr. With other beneficiaries she also got trained but unlike others, she continues her practice of making tumba pickle, continuously in every season. Initially she encountered with lots of problem of finanacal assistance. But it was flattering to her that tumba is cheaply and easily available to her as it is available to her at road side, agriculrure land of her and others as weed. Neighbor also donate this her as it is of use to them

Although the time she started making pickle out of weed critics were there to discourage her but with her determination and confidence she made it possible to start her own enterprice of tumba pickle. It is very content to say that she after knowing the method of removing bitterness of tumba, made some other products out of tumba like tumba churna (separately for human being and for animals), tumba murabba etc. she is continue in her job and placing new milestones every day. She is in regular touch with scientists. She is being monitored continuously so that she will move in right direction.
Output
A sixty year old lady who had no choice rather than doing hard work in his small piece of land is now able to make earning in such amount that she with her family can have rich meal thrice a day. Tarachand Meghwal, her husband supported a lot throughout her journey of hard work. Below mentioned table: 1, interpret the capital required to make 1 kg of pickle.

Table 1

<table>
<thead>
<tr>
<th>S. No</th>
<th>Material Required</th>
<th>Amount</th>
<th>Cost in Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tumba</td>
<td>1 kg</td>
<td>Nil</td>
</tr>
<tr>
<td>2</td>
<td>Spices (full composition)</td>
<td>300g</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Mustard Oil</td>
<td>1 lit</td>
<td>140</td>
</tr>
<tr>
<td>4</td>
<td>Lime</td>
<td>30g</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Water</td>
<td>As per requirement</td>
<td>Nil</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>155</td>
</tr>
</tbody>
</table>

Here, it is very clear from the table that there is least amount requirement for making tumba pickle, which a rural woman can afford.

Table 2

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Amount of pickle sold (Kg)</th>
<th>Price of pickle sold (Rs)</th>
<th>Year</th>
<th>Profit (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20</td>
<td>200</td>
<td>2013-14</td>
<td>4000</td>
</tr>
<tr>
<td>2.</td>
<td>25</td>
<td>200</td>
<td>2014-15</td>
<td>5000</td>
</tr>
<tr>
<td>3.</td>
<td>40</td>
<td>300</td>
<td>2015-16</td>
<td>12000</td>
</tr>
<tr>
<td>4.</td>
<td>57</td>
<td>400-500</td>
<td>2016-17</td>
<td>25000</td>
</tr>
</tbody>
</table>

Table 2 suggests the amount of pickle Dhapi Devi sold in consecutive years. This clearly shows her proficiency over pickle making in each coming years.

Dhapi devi stated her own enterprice to sale different value added products of tumba. She started her own shop name “Yahan tumba ke achar milte hai” in her village. Although, initially she didn’t get that fame and popularity but latter with passing years her products are that much famous that people from far places come to her for tumba pickles. Now she has expanded her business, she started selling vegetables also at her shop with other tumba products. She becomes icon of Aaspalsar village. Village ladies come to her to get pickle making process. She equally responds and helps everyone.

Impact
Village is a place where everyone is closely knitted and supports each other. Dhapi devi also get support and fondness of every one. One success lady can change the growth rate of a family and with growing family village will raise its standard. Becoming iconic in village, every family especially ladies would like to follow the foot prints of dhapi devi.

Outcome
From the above mentioned table and figure it is clear that if one wants to learn and achieve something, it is possible to get useful even out of nothing. Tumba is merely a weed out of which dhapi devi with the help of KVK scientist made different value added products.

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References