

Non Timber Forest Products (NTFPs) are primary source of livelihood and contribute significantly to forestry economy of developed and industrialized nations. Value addition of NTFPs increases sales by creating product diversity, stabilizes income by allowing income creation during off season as well as make use of excess produce. Arid Forest Research Institute, Jodhpur has standardized methods of value addition of some important lesser known NTFPs of Rajasthan in tribal areas as profitable and viable option to the tribals. Some of the nutritionally rich and medicinally important lesser known species selected for value addition are described here:

***Feronia limonia* Linn (Kotumbra or kaith):** Its fruits has medicinal values and are used to cure cough, dysentery, heart diseases, vomiting, removes biliousness, “vata”, “tridosaha”, blood impurities, fatigue, thirst, asthma, tumours, ophthalmia, leucorrhoea and scurvy. Fruits are good sources of antioxidants and are sold in market at prevailing rate of Rs. 40-50 per kg.

**Preparation of Pickle:** Ingredients are fresh fruit-1kg, turmeric powder, coriander, salt, red chilly powder, methi (fenugreek) seeds, yellow mustard seeds according to taste, cooking oil- 1 lit.



- Fresh unripe fruits are washed thoroughly, hard shell of fruits is scooped out and pulp is cut into small pieces.
- Pulp is mixed thoroughly with all spices as per taste and tied with muslin cloth.
- It is left overnight and then next day, pickle is transferred into an air tight jar.
- Oil is heated, allowed to cool and then it is poured into pickle. Pickle can be stored in air tight jars for six months.

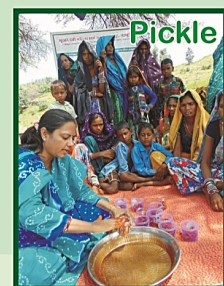
**Murabba:** Ingredients are fresh fruits- 1kg, Jaggary- 1 kg, salt to taste and potassium meta bi sulphite-1 pinch.



- Fresh unripe fruits are washed thoroughly, hard shell of fruits is scooped out and pulp is cut into small pieces.
- Jaggary is ground into fine powder or very small pieces and mixed thoroughly with pieces of fresh fruits.
- The mixture is left overnight.
- Next day murabba is transferred into air tight jars and kept in sunlight for 5-7 days.
- After one week, murabba is ready. It can be stored in air tight jars for six months.

***Momordica dioica* (Kankeda):** It is a perennial, dioceous climber commonly known as Parora, kankoda. It has high food value containing high amount of carotene among cucurbitaceous vegetables and high amount of protein and fair amount of phosphorus, calcium and iron. It is a cheap source of vitamins and minerals.

**Preparation of Pickle:** Ingredients are fresh fruits-1kg, other spices of pickle according to taste, cooking oil- 1 lit.



- Fresh unripe fruits are washed thoroughly and cut into two or four pieces.
- They are passed through boiling water and excessive water is scanted off.
- The fruits are now kept for drying in sunlight on muslin cloth for 6-7 hours and left overnight for air drying.
- Properly dried fruits are now mixed thoroughly with all spices as per taste, tied with muslin cloth and left overnight. Next day pickle is transferred into an air tight jars.
- Oil is heated, allowed to cool and then it is poured into pickle. Muslin cloth is tied on the mouth of these jars and kept in sunlight for 5-7 days.
- After one week, pickle is ready. It can be stored in air tight jars for one year.

***Tamarindus indica* (Tamarind/ Imli):** Every part of *T. indica* plant (root, body, fruit, leaves) not only has rich nutritional value and broad usage in medicine but also has industrial and economic importance. Tamarind fruit is an ideal source of all essential amino acids except tryptophan. The leaves are used to cure skin diseases, piles, antidote against venomous insects. Pods are sold in market at prevailing rate of Rs. 30-60/- kg.

**Preparation of Chutney:** Ingredients are tamarind pods-1 kg, water-1 lit., sugar-1.75 kg, sodium benzoate-1 pinch, kevda essence-4-5 drops.



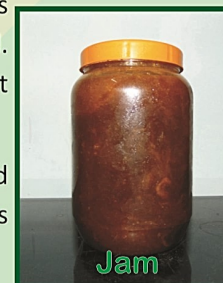
- Water is boiled in a container, cleaned tamarind pods are added to it and again boiled for 20 minutes.
- Mixture is allowed to cool and seeds are removed.
- This mixture is boiled with sugar for 20 minutes, allowed to settle, muslin cloth is tied on the mouth of container and mixture is left overnight.
- Next day 1 pinch sodium benzoate and 4-5 drops of kevda essence is added.
- Chutney is ready and can be stored in an air tight containers for one year.

**Squash:** Ingredients are tamarind-250 g, water-1 lit., sodium benzoate-1 pinch, kevda essence 4-5 drops.

- 250 g tamarind pod pulp is boiled in 1 litre water for 10 minutes. It is cooled and seeds are removed. 250 g sugar is added and the mixtures is boiled for 10 minutes and allowed to cool.
- Now 1 pinch sodium benzoate and 4-5 drops kevda essence are added and mixture is filtered. Squash is ready and can be stored in an air tight bottles for six months.



**Tamarind Jam:** Procedure for preparation of tamarind jam is similar to chutney but the consistency of Jam is thick in comparison to chutney.



***Leptadenia reticulata*: Leptadenia reticulata** (Retz) also known as 'dodi' or jivanti is in great demand owing to its medicinal and edible uses. Leaves, shoots and follicles are used as vegetable. Pods are sold in the market at a price of around Rs 600-800/- per kg.

**Preparation of Pickle:** Ingredients are fresh pod-1 kg, other spices for pickle according to taste, sugar-250 g or according to taste (for sweet pickle according to taste), cooking oil-1 lit.

- Washed fresh pods are cut from centre longitudinally.
- Pods are put in boiling water and gas is turned off.
- After cooling, the boiled pods are taken out and kept overnight at room temperature on muslin cloth.
- Oil is heated and salt and other spices are added to it. Mixture is cooled and the pods are put into this.
- It is then sun dried for 8-10 days. Pickle is ready now. For Khatta-Meetha pickle sugar is added in it.



**Mangodi:** Ingredients are moong dal-250 g, pods-100-200 g, cut green chilli, coriander, salt to taste.

- Moong dal (250 g) is soaked overnight and ground in the morning and 100-200 g grated pods are mixed.



- In addition, salt, coriander, chilli etc., are added as per taste and the mixture is applied on a plastic sheets in form of Mangodi.

After drying these can be cooked with potatoes as vegetable.





**Cordia gharaf (Goondi):** It is commonly utilized locally as source of food and medicine. Fruits contribute significantly to food and energy needs of rural populations and are sold in the market @Rs 80-100/kg.

**Preparation of Murabba:** Ingredients are fresh fruits-1kg, sugar-1kg, green cardamom seeds crushed-1/2 teaspoonful, potassium meta bisulphite-1/2 pinch

- Fruits are washed and dried in shade, they are put into a jar, sugar and Pot. Metabisulphite is added and sundried for 10-15 days.
- Now cardamom seed powder is added.
- The murabba is ready now.

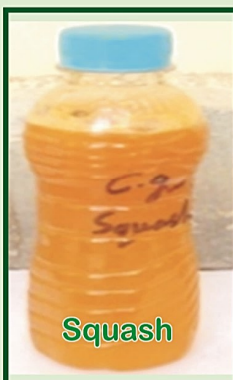
**Pickle:** Ingredients are fresh fruits-1 kg, turmeric powder, salt, red chilly powder, Methi (fenugreek) seeds, yellow mustard seeds, according to taste, sugar-250 g or according to taste (for sweet pickle), cooking oil-1 lit.



- Washed fruits are put in boiling water for 10 minutes, allowed to cool down and kept overnight at room temperature on muslin cloth.
- Now spices are ground to a coarse powder and mixed with fruits. For Khatta-Meetha pickle sugar is added.
- Mustard oil is heated, cooled and put into above mixture. Muslin cloth is tightened on the mouth of container and kept in sunlight for 4-5 days.
- After 5 days the pickle is ready.

**Squash:** Ingredients are fruit juice-100 ml, lemon juice-¼ spoon, water-50 ml, sugar-30 g, citric acid-4 g.

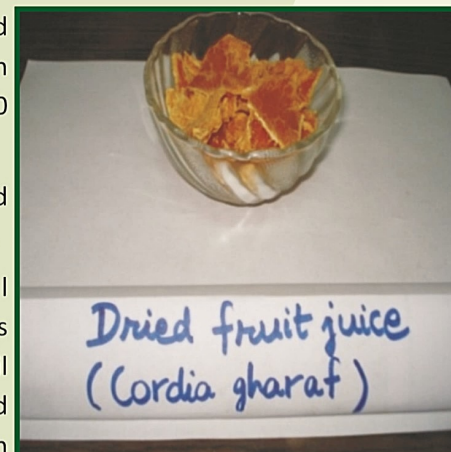
- Water is boiled and sugar is added to prepare chashni.
- Citric acid and the lemon juice is added to chashni, simmered for 10 minutes and allowed to cool.
- Now it is sieved and clear squash is obtained. It is poured into sterilized bottles.



**Candy:** Ingredients are Juice-100 ml, Sugar-10 g

- Fresh fruits are washed with warm water and grinded on a low speed grinder or mixer so that their seeds do not get crushed. Now juice is separated from the seeds and fibres with the help of a muslin cloth.

- It is heated in a pan and sugar in the proportion 100g/litre is added after 10 minutes.
- Juice is allowed to boil and the froth formed is removed.
- The juice is boiled until slightly thick. Now it is poured in a plate in which oil has been applied and allowed to dry in shade. Dried juice in the form of candy is ready for use.



**Manilkara hexandra (Roxb.) Dubard:** *Manilkara hexandra* (Roxb.) is locally known as 'Khirni', 'Rayan' and 'Raina' among the tribal populations. Fruits are good source of Vitamin A.

**Dehydrated/ Dry Fruits:** Fresh fruits and water

- Fresh fruits are washed, dried and then boiled in water for 10 minutes.
- They are allowed to cool and seeds are removed.
- Deseeded fruits are now kept in sun for 3-4 days for drying. Dehydrated fruits are ready and may be packed and sold in market.



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# Enhancing of Livelihood Generation through Value Addition of Non Timber Forest Products: NTFPs



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