

Local Vegetable Production in Spate Irrigated Areas, Experiences from The Kachi Plain Flood Irrigated System in Pakistan

41



Practical Note



Introduction

Vegetables are an essential part of human consumption all over the world but its cooking methods can differ in different cultures and regions. In many situations all vegetables are produced with regular water supplies at the farm level, either on the open field or in greenhouses. Pakistan has different climate zones, dry and humid and different terrain-types (high- and lowlands) that are suitable for cultivation of all types of vegetables throughout the year. Lowlands produce vegetables from October to December, whereas highlands produce vegetables from April to August so deficiency of vegetables in one area is met from the production of other area. Hence, the vegetables are available in the market throughout the year. There is a decrease in yield when highlands are exposed to cold winds and the vegetation on the ground dries up. But if lowland vegetables are still a month away from being harvested, the food markets become unstable and prices for all supplies, especially tomatoes, rise.

Almost the entire agricultural zones in the country of Pakistan produce vegetables on a commercial level, provided that water is available throughout the year (see Box 1). But there are also still dry, arid and remote areas where vegetables are not produced on a commercial basis. However, in these areas there are some sort of wild or seasonal vegetables which are available to the local population at a specific time of the year to enjoy the taste of naturally produced vegetables. For example, in high land of Balochistan, the spring season comes with wild species of spinach called Bushkay in Pashtu and Patrik in Balochi and Brahvi language. This vegetable is collected by the nomads and sold in the local market. This vegetable is available for one month only. Similarly, there is another green plant that grows naturally in the highlands of Balochistan called Raghbolay which is consumed directly as a salad.

In the project area¹, there are number of vegetables that are either grown on the seasonal moisture or are naturally available for a short span of time. Lufa, Tinda, Guar beans are cultivated vegetables while edible wild and truffle mushrooms, Lular, Saag (green leaf of mustard and arugula plant, a type of spinach) are grown naturally in Rabi season. Other than lufa, all vegetables are collected and consumed at home level and surplus is sold in the market. The district Ziarat in Balochistan is a highland area where black cumin grows naturally and an annual auction is conducted under the supervision of Provincial Forest Department.

There are 59 different reported wild species in

only one area of spate irrigation, district Harnai, Balochistan, which are either cooked, directly consumed as raw intake or cooked with other edibles, and treatment of different ailments².

In the next section, a selection of the vegetables grown or harvested in spate areas are discussed below along with their use.

Box 1: Flood seasons in the Kachi Plains, Balochistan.

The main Spate floods arrive in the Kachi plains in the months of June, July and August. The first cropping season (Kharif) then follows from September till November.

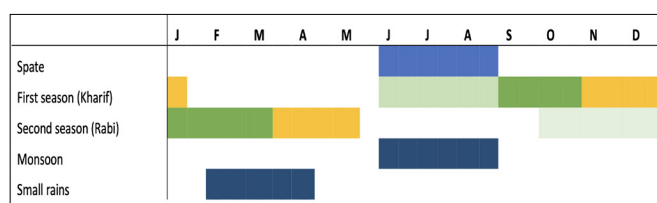


Figure 1: Flood seasons in the Kachi Plains, Balochistan (source: MetaMeta, 2020)

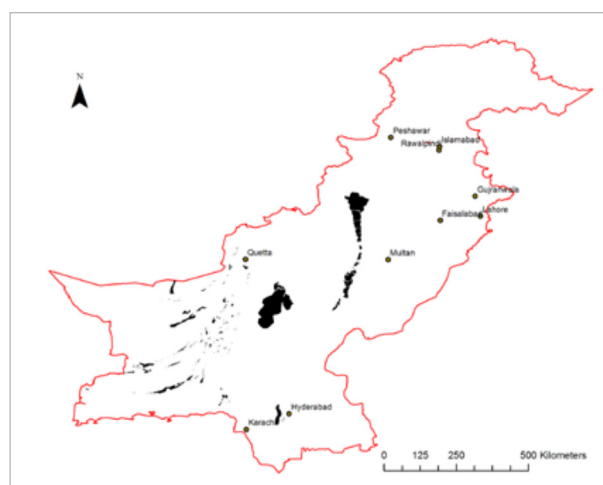


Figure 2: Areas where Spate Irrigation occurs in Pakistan (source: FBLN Pakistan)

¹ This Practical Note has been written as part of the Newarbi project, see: <https://floodbased.org/projects/newarbi/>

² https://www.researchgate.net/publication/303844437_Ethnomedicinal_utilization_of_wild_edible_vegetables_in_district_harnai_of_balochistan_province-pakistan

Vegetables grown in spate irrigation areas in Pakistan

1 Tinda & Luffa

Tinda is a vegetable that is grown in almost all flood irrigated areas of Pakistan. In the project area, 2 types of tinda grow seasonally (i) the wild and (ii) cultivated type. The wild tinda grows in the dry plain lands after the monsoon rains. It is considered a gift from God and it can be picked by anyone. Whereas, it is sown in cultivated lands after the floods when fields are filled with the water in early June every year. Normally all farmers cultivate tinda on the high ridges of embankments where soil is soft or on the land where moisture is available for longer time. It starts giving fruits within two months of its cultivation, usually at a time of the when there are few vegetables available in the rural markets. Farmers pick tinda from fields on regular basis and sell the surplus in the local market after utilization at household. Tinda is creeper plant and it lasts for 2 months. During the June month of the year 2021, the Newarbi Project supplied seeds to one of the farmers to grow tinda vegetables on a small piece of land along the Nari River using pumped water from the river. Using only this one acre of land the farmer earned 1500 USD from its seasonal sale of vegetable, which shows potential for upscaling the cultivation of this vegetable crop.



Figure 3: Tinda Locally Grown in Bha Nari Area (picture: Allah Bakhsh and Abdul Salam)

Lufa is another local vegetable which is similar to tinda. It is grown by many farmers along the banks and water ponds. It is normally cultivated in the month of July and harvested after 60 days. Lufa is usually cultivated by the farmers for their domestic use only. It is not sold in the market like Tinda.



Figure 4: Luffa Grown Locally on edges of the embankments and field bunds (picture: Allah Bakhsh and Abdul Salam)

2 Mushroom/Truffles

Truffle mushroom is a local seasonal product which can be found in the sorghum fields. Its production varies from year to year as it depends on the rains after cultivation of Sorghum crop. Its availability is rare and a single person can gather up to 2-5kgs per day. People with special skills and experience can gather truffle mushroom as it grows below the surface at the depth of 3-6 inches in certain pockets. It grows in comparatively softer sandy soils and it has certain type of white powdery signs on top of the surface which indicates its availability. Truffle Mushroom is a regional product and it is consumed within the local areas rather selling it into bigger markets due to its smaller quantity and lesser availability. Truffle Mushroom has different names in the different spate irrigated area of Pakistan. In DG Khan it is called “Bhoieen Dita”, while in Kachi plain it is called “Boo Phoor” which means “the soil cracker”.



Figure 5: Local Truffle Mushroom (Picture: picture: Allah Bakhsh and Abdul Salam)

The Truffle Mushroom's availability is also reported from the plain areas of highlands as well. The dry valleys around Quetta are also producing such mushrooms in the spring seasons and local inhabitant gather it during the season.

There is another type of mushroom that grows on the surface of soil after rains. This mushroom can be found in large quantities in sandy deserts. In project area, a low standard surface mushroom can be found which is collected by the locals for their domestic use. Surface Mushrooms are available in the month of July-August while subsurface truffles are available in the month of October every year in Kachi Plain.

A separate Practical Note on the harvesting and use of truffles is available on www.floodbased.org, in both English and Urdu. See: Practical Note 14 'Desert mushrooms and truffles in Pakistan' ([English](#) and [Urdu](#)).

3 Guar Beans

Guar is cultivated along with the Sorghum (through intercropping) and separately as well in Kachi Plain. It carries green beans and it is usually picked by local farmers starting from the second week of October. This vegetable can be harvested for a period of 45 days. This vegetable is preferred for domestic use and only a few farmers sell it on the market.

Guar is an antioxidant and normalizes the function of gastrointestinal tracts. This medicinal characteristics of the guar bean are known to the local people as well. Guar bean cannot be dried for subsequent use in the off season. Guar beans are organic and no chemical, fertilizers or insect killers are used in the spate irrigated areas. Picking beans from any field is free for locals subject to their domestic use, but no one is allowed to sell them without the consent of the landowner.

More information on the production of Guar in Spate Irrigation Systems, can be found in Practical Note 19, available on <https://floodbased.org/>.



Figure 6: Chopped Guar Beans Locally Produced in Bhag (picture: picture: Allah Bakhsh and Abdul Salam)



Figure 7: Harvested Guar (picture: Allah Bakhsh and Abdul Salam)



Figure 8: Guar grown in Mianwali, Punjab (picture: Allah Bakhsh and Abdul Salam)

4 Saag (Green leaf of Mustard)

Green leaves of mustard plant known as Saag in local language, are another type of local winter vegetable. This is a Rabi season crop which is cultivated simultaneously with chickpeas, wheat and barley. It is cultivated from Mid-Oct to Mid-Nov every year subject to availability of moisture. Green leaves from the young mustard plants are plucked by the farming household and cooked locally. Arugula plants are also grown abundantly alongside mustard crops. It is cooked in a same way as the “Saag”. Arugula leaves are also directly consumed as a salad.



Figure 9: Locally Produced Saag in Project Area (picture: picture: Allah Bakhsh and Abdul Salam)

Selling of mustard leaves in the local market is common. Mustard leaf are also dried up by many households for consumption in off season as well. The sale of dried leaf is not common. Some of the households in Kachi Plain make pickles from the soft shoots of the mustard plant and use it at home level. In Punjab such pickles can be found on small scale for sale in the local market.

There is another small plant which grows in Kachi Plain only called “Lulhur”. It is wild leafy vegetable which is grown during the winter season and can be found in wheat crop or on the edges of the field. It is consumed on the same pattern as of “Saag” and cooked together with other edibles like pulses etc.

5 Green Chickpeas Pod and Leaf

Green Chickpeas are also produced in the project area locally known as “Pali” or “Phali”. Its green and twiggly leaves are also plucked and cooked on the same pattern as of “Saag”. Chickpea is common winter crops grown throughout the country but its leaves are cooked as vegetable only in project area and some parts of Sindh Province.

Green pods are plucked and fresh green chickpeas are used as vegetable in Kachi plain and Sindh Province. The sale of the fresh pods is common and can be found in the local vegetable markets during the season. The green chickpeas are also cooked with rice.



Figure 10: Green Chickpeas with leaves (picture: Shutterstock)

6 Teetak

Teetak is a new crop which is introduced by the FBLN project in the project area during 2021. Teetak is creeper plant which can be cultivated together with the Sorghum. After flowering, it bears tiny round shape vegetable. When it grows bigger in size its skin become thick which is utilized as fodder for the small ruminants. The Seeds of the crop are separated when ripen to be used for next crop and the remains are consumed by the cows and bullocks as a fodder. Only 10 farmers were selected for the trial. The crops gave wonderful results in terms of plant health and fruit bearing. Some households used it to make pickles also but its use is not common yet as it is a new crop.



Figure 11: Newly Introduced Teetak Crop & Fruit (picture: picture: Allah Bakhsh and Abdul Salam)

Bottlenecks

The major bottleneck limiting the uptake of local vegetables cultivated in spate irrigated areas is that they are not known to the general public living in the cities. Secondly, due to changes in the cropping pattern, people living away from spate areas are not used to consuming such vegetables since such vegetables are either not available in the local market or people are not adapted to the tastes. As an example, guar is a lowland spate crop that has never been cultivated in the highlands, so people from the highland ecology are not aware of its taste. The availability of guar bean in the local market is not common and mostly the people living in the spate ecologies are more adapt to its consumption. In Sindh the case is different as guar production, sales, and consumption as vegetables are common and beans are frequently available in the market not only in the season but off-season as well.

Another example is the case with palli (green chickpeas). The green twiggly leaves of grains are cooked on the pattern of spinach in Sindh and in the Bhag area of Bolan Balochistan. Grains are leaf's in all spate ecologies, but its leaf's consumption as a green vegetable is not common. So, these leaves are only available either in Sindh province or in Bhag Nari Balochistan. There is a need to introduce these dishes to the people in other areas when grains leaves are in season.

The challenge with truffle mushrooms, which are a natural vegetable, is that it is available in the local area during the month of October-November only. Its production is on a small scale which is only sold in the local market. It is not founded in larger quantities which would enable sales to the bigger markets.

Recommendations

There is a need to conduct practical sessions in different areas when these vegetables are available in the season, which will enlighten the communities on the uses of these local vegetables. For example, cooking grain leaves in Punjab spate irrigated will enhance the awareness about its characteristics and cater to the need of at least local people. Similar is the case with guar beans, which can be collected in the local area and needs to introduce in the areas where it is not consumed or people do not know about it. Thus gradually it can be introduced in the local area and later on the market will be developed by these people. The problem of adaptation to the taste will remain a major bottleneck in making it in the public interest.

Colophon

This practical note is prepared by Allah Bakhsh (SPO Pakistan) and edited by Zunaira Maab (MetaMeta) and Reinier Veldman (MetaMeta) for the Flood-Based Livelihoods Network (FBLN). The note has been written as part of the New Water Rights For Basin Management And Inclusivity In Spate Irrigated Areas Of Pakistan (Newarbi) project.

For more information on the project: <https://floodbased.org/projects/newarbi/>

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